

IFB No. BSHP-III (Phase-2)/Pkg-3/SH-95

Patna, Dated 25.04.2022



BIHAR STATE ROAD DEVELOPMENT CORPORATION LIMITED

(A Govt. of Bihar Undertaking)

ROAD & HIGHWAY WORKS

ENGINEERING PROCUREMENT AND CONSTRUCTION (EPC)

AGREEMENT WITH SCHEDULES

**(Based on Model EPC Agreement of the Ministry of Road Transport
and Highways, GoI)**

FOR

**Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo
Halt Section of Mansi- Saharsa-Hardi Chaughara Road(SH-95) from KM
0+000 to KM 14+125 (Length- 14.125 KM) in the State of Bihar on EPC
Mode**

(Civil Works Contract Package No. BSHP-III (Phase-2)/Pkg-3/SH-95)

BID DOCUMENT

VOLUME – II

BIHAR STATE ROAD DEVELOPMENT CORPORATION LIMITED

RCD Mech. Workshop Campus, Sheikhpura,

Patna - 800 014, BIHAR

April. 2022

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Not to be used as a Bid Document, Only for Reference

Part I Preliminary

Not to be used as a Bid Document, Only for Reference

ENGINEERING, PROCUREMENT AND CONSTRUCTION AGREEMENT

THIS AGREEMENT is entered into on this the day of, 20.....at Patna, Bihar

Between

Bihar State Road Development Corporation Limited (BSRDCL), a company incorporated under [Indian] Companies Act, 1956, by the Government of Bihar, Pursuant to Resolution No. Sec/8/Misc/05-117/2006-1014(s) represented by its Chief General Manager and having its principal offices at RCD Mechanical Workshop Campus, Sheikhpura, Patna (Bihar) (hereinafter referred to as the “ **Authority**” which expression shall, unless repugnant to the context or meaning thereof, includes its administrators, successors and assigns) of One Part

And

{.....,} the selected bidder having its registered office at....., (hereinafter referred to as the “**Contractor**” which expression shall, unless repugnant to the context or meaning thereof, include its successors and permitted assigns) of the **Other Part**;

WHEREAS:

- A. The Authority is engaged in the development of highways and as a part of its endeavour, the Authority had decided to undertake “**Design, Engineering, Procurement and Construction of Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section Section of Mansi- Saharsa- Hardi Chaughara Road(SH-95) (Length – 14.125 KM) in the State of Bihar on EPC Mode,**” through a design, engineering, procurement and construction contractor to be selected through open competitive bidding process.
- B. The Authority resolved to undertake the **Design, Engineering, Procurement and Construction of Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section of Mansi- Saharsa-Hardi Chaughara Road(SH-95) from KM 0+000 to KM 14+125 (Length- 14.125 KM) in the State of Bihar on EPC Mode** basis in accordance with terms and conditions to be set forth in an agreement to be entered into.
- C. The Authority accordingly invited proposals by its Invitation for Bids (IFB No.-----, dated:-----) from eligible bidders as per the Technical and Commercial Terms and Conditions prescribed in the RFP for undertaking the project.
- D. After evaluation of the bids received, the Authority accepted the bid of the selected bidder and issued its Letter of Acceptance No. dated (herein after called the “**LOA**”) to the selected bidder for construction and maintenance of the above project

road at the Contract Price specified hereinafter, requiring the selected bidder to inter alia:

- (i) to give his consent to enter into this Agreement and the enforceability of the provisions thereof, within 3 (Three) days of the date of issue of LOA;
 - (ii) submit Performance Security and Additional Performance Security (if any) as per RFP requirements, and
 - (iii) execute this Agreement within 30 (Thirty) days of the date of issue of LOA.
- E. The Contractor has fulfilled the requirements specified in Recital (D) above;

NOW, THEREFORE, in consideration of the foregoing and the respective covenants set forth in this Agreement, the sufficiency and adequacy of which is hereby acknowledged, the Authority hereby covenants to pay the Contractor, in consideration of the obligations specified herein, the Contract Price or such other sum as may become payable under the provisions of the Agreement at the times and in the manner specified by the Agreement and intending to be legally bound hereby, the Parties agree as follows:

The following documents attached hereto shall be deemed to form an integral part of the Contract:

- (a) **Volume-I :**
 - The Agreement;
 - Corrigendum to the Agreement;
 - Addendum and Response to pre-bid queries if any;
 - Letter comprising the financial Bid;
 - Letter comprising the Technical Bid;
 - Letter of Acceptance;
 - Power of Attorney;
 - Joint Venture Agreement, if any;
 - Any other document to be specified
- (b) **Volume-II: Technical Bid**
 - IFB (Invitation for Bids)
 - RFP (Request for Proposal)
 - Any other documents to be specified
- (c) **Volume-III :**
 - Project Drawing

Article 1

Definitions and Interpretations

1.1 Definitions

- (i) The words and expressions beginning with capital letters and defined in this Agreement shall, unless the context otherwise requires, have the meaning ascribed thereto herein, and the words and expressions defined in the Schedules and used therein shall have the meaning ascribed thereto in the Schedules.
- (ii) In this Agreement, the following words and expressions shall, unless repugnant to the context or meaning thereof, have the meaning hereinafter respectively assigned to them:

“Accounting Year” means the financial year commencing from the first day of April of any calendar year and ending on the thirty-first day of March of the next calendar year;

“Advance Payment” shall have the meaning set forth in Clause 19.2;

“Affected Party” shall have the meaning set forth in Clause 21.1;

“Affiliate” means, in relation to either Party {and/or Member}, a person who controls, is controlled by, or is under the common control with such Party {or Member} (as used in this definition, the expression “control” means, with respect to a person which is a company or corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person, and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person, whether by operation of law or by contractor otherwise);

“Agreement” means this Agreement, its Recitals, the Schedules hereto and any amendments thereto, or any supplementary agreement made in accordance with the provisions contained in this Agreement;

“Applicable Laws” means all laws, brought into force and effect by the GOI or the State Government including rules, regulations and notifications made thereunder, and judgements, decrees, injunctions, writs and orders of any court of record, applicable to this Agreement and the exercise, performance and discharge of the respective rights and obligations of the Parties hereunder, as may be in force and effect during the subsistence of this Agreement;

“Applicable Permits” means all clearances, licenses, permits, authorizations, no objection certificates, consents, approvals and exemptions required to be obtained or maintained under Applicable Laws in connection with the construction, operation and maintenance of the Project Highway during the subsistence of this Agreement;

“Appointed Date” means the date declared by the Authority as the project commencement date with the consent of the contractor, as per the process prescribed in Article 3 and 8 of this Agreement;

“Arbitration Act” means the Arbitration and Conciliation Act, 1996, with all its subsequent amendments;

“Authority” shall have the meaning attributed thereto in the array of Parties hereinabove as set forth in the Recitals;

“Authority Default” shall have the meaning set forth in Clause 23.2;

“Authority’s Engineer” shall have the meaning set forth in Clause 18.1;

“Authority Representative” means such person or persons as may be authorized in writing by the Authority to act on its behalf under this Agreement and shall include any person or persons having authority to exercise any rights or perform and fulfill any obligations of the Authority under this Agreement;

“Bank” means a bank incorporated in India and recognized by the Reserve Bank of India;

“Base Rate” means the floor rate of interest announced by the Reserve Bank of India for all its lending operations;

“Bank Rate” means the rate charged by the Reserve Bank of India for lending funds to commercial banks.

“Base Date” means the last date of the calendar month, which precedes the Bid Due Date by at least 28 (twenty eight) days;

“Bid” means the documents in their entirety comprised in the bid submitted by the [selected bidder/ Joint venture] in response to the Request for Proposal in accordance with the provisions thereof;

“Bid Security” means the bid security provided by the Contractor to the Authority in accordance with the Request for Proposal and which is to remain in force until substituted by the Performance Security;

“Change in Law” means the occurrence of any of the following after the Base Date:

(a) the enactment of any new Indian law;

(b) the repeal, modification or re-enactment of any existing Indian law;

(c) the commencement of any Indian law which has not come into effect until the Base Date; or

(d) a change in the interpretation or application of any Indian law by a judgement of a court of record which has become final, conclusive and binding, as compared to such interpretation or application by a court of record prior to the Base Date.

“Change of Scope” shall have the meaning set forth in Article 13;

“Change of Scope Notice” shall have the meaning set forth in Clause 13.2 (i);

“Change of Scope Request” shall have the meaning set forth in Clause 13.2 (ii);

“Change of Scope Order” shall have the meaning set forth in Clause 13.2 (iv);

“Completion Certificate” shall have the meaning set forth in Clause 12.2;

“Construction” shall have the meaning set forth in Clause 1.2 (f);

“Construction Period” means the period commencing from the Appointed Date and ending on the date of the Completion Certificate;

“Construction Zone” shall have the meaning set forth in Clause 8.3 (i);

“Contract Price” means the amount specified in Clause 19.1 (i);

“Contractor” shall have the meaning attributed thereto in the array of Parties Hereinabove as set forth in the Recitals;

“Contractor Default” shall have the meaning set forth in Clause 23.1;

“Cure Period” means the period specified in this Agreement for curing any breach or default of any provision of this Agreement by the Party responsible for such breach or default and shall:

- (a) commence from the date on which a notice is delivered by one Party to the other Party asking the latter to cure the breach or default specified in such notice;
- (b) not relieve any Party from liability to pay Damages or compensation under the provisions of this Agreement; and
- (c) not in any way be extended by any period of Suspension under this Agreement, provided that if the cure of any breach default by the Contractor requires any reasonable action by the Contractor that must be approved by the Authority or the Authority’s Engineer hereunder, the applicable Cure Period shall be extended by the period taken by the Authority or the Authority’s Engineer to accord their approval;

“Damages” shall have the meaning set forth in paragraph (w) of Clause 1.2;

“Defect” means any defect or deficiency in Construction of the Works or any part thereof, which does not conform with the Specifications and Standards, and in the case of Maintenance, means any Defect or deficiency which is specified in Schedule-E;

“Defects Liability Period” shall have the meaning set forth in Clause 17.1;

“Dispute” shall have the meaning set forth in Clause 26.1;

“Dispute Resolution Procedure” means the procedure for resolution of Disputes set forth in Article 26;

“Drawings” means all of the drawings, calculations and documents pertaining to the Project Highway as set forth in Schedule-I, and shall include ‘as built’ drawings of the Project Highway;

“Document” or “Documentation” means documentation in printed or written form, or in tapes, discs, drawings, computer programmes, writings, reports, photographs, films, cassettes, or expressed in any other written, electronic, audio or visual form;

“Emergency” means a condition or situation that is likely to endanger the safety or security of the individuals on or about the Project Highway, including Users thereof, or which poses an immediate threat of material damage to any of the Project Assets;

“Encumbrances” means, in relation to the Project Highway, any encumbrances such as mortgage, charge, pledge, lien, hypothecation, security interest, assignment, privilege or priority of any kind having the effect of security or other such obligations, and shall include any designation of loss to payees or beneficiaries or any similar arrangement under any insurance policy pertaining to the Project Highway, where applicable herein but excluding utilities referred to in Clause 9.1;

“EPC” means engineering, procurement and construction;

“Final Payment Certificate” shall have the meaning set forth in Clause 19.15;

“Final Payment Statement” shall have the meaning set forth in Clause 19.13;

“Force Majeure” or “Force Majeure Event” shall have the meaning ascribed to it in Clause 21.1;

“GAD” or “General Arrangement Drawings” shall have the meaning set forth in Clause 3.1 (iii) (b);

“GOI” or “Government” means the Government of India;

“Good Industry Practice” means the practices, methods, techniques, designs, standards, skills, diligence, efficiency, reliability and prudence which are generally and reasonably expected from a reasonably skilled and experienced contractor engaged in the same type of undertaking as envisaged under this Agreement and which would be expected to result in the performance of its obligations by the Contractor in accordance with this Agreement, Applicable Laws and Applicable Permits in reliable, safe, economical and efficient manner;

“Government Instrumentality” means any department, division or sub-division of the Government or the State Government and includes any commission, board, authority,

agency or municipal and other local authority or statutory body including panchayat under the control of the Government or the State Government, as the case may be, and having jurisdiction over all or any part of the Project Highway or the performance of all or any of the services or obligations of the Contractor under or pursuant to this Agreement;

“Handover Memorandum” shall have the meaning set forth in Clause 8.2;

“IRC” means the Indian Roads Congress;

“Indemnified Party” means the Party entitled to the benefit of an indemnity pursuant to Article 25;

“Indemnifying Party” means the Party obligated to indemnify the other Party pursuant to Article 25;

“Indirect Political Event” shall have the meaning set forth in Clause 21.3;

“Insurance Cover” means the aggregate of the maximum sums insured under the insurance taken out by the Contractor pursuant to Article 20, and includes all insurances required to be taken out by the Contractor under Clauses 20.1 and 20.9 but not actually taken, and when used in the context of any act or event, it shall mean the aggregate of the maximum sums insured and payable or deemed to be insured and payable in relation to such act or event;

“Intellectual Property” means all patents, trademarks, service marks, logos, get-up, trade names, internet domain names, rights in designs, blue prints, programmes and manuals, drawings, copyright (including rights in computer software), data base rights, semiconductor, topography rights, utility models, rights in know-how and other intellectual property rights, in each case whether registered or unregistered and including applications for registration, and all rights or forms of protection having equivalent or similar effect anywhere in the world;

“Interim Payment Certificate” or **“IPC”** means the interim payment certificate issued by the Authority’s Engineer for payment to the Contractor in respect of Contractor’s claims for payment raised in accordance with the provisions of this Agreement;

“Joint Venture” means the group of entities which have come together for implementation of this Project;

“Lead Member” shall, in the case of a joint venture, mean the member of such joint venture who shall have the authority to bind the contractor and each member of the Joint venture; and shall be deemed to be the Contractor for the purposes of this Agreement; the Lead Member shall itself undertake and perform at least 51% (fifty one per cent) of the total length of the Project Highway;

“LOA” or **“Letter of Acceptance”** means the letter of acceptance issued by the Authority as referred to in Recital (D);

“Maintenance” means the maintenance of the Project Highway as set forth in Article 14 for the period specified therein;

“Maintenance Inspection Report” shall have the meaning set forth in Clause 15.2;

“Maintenance Manual” shall have the meaning ascribed to it in Clause 10.7;

“Maintenance Programme” shall have the meaning set forth in Clause 14.3;

“Maintenance Period” shall have the meaning set forth in Clause 14.1;

“Maintenance Requirements” shall have the meaning set forth in Clause 14.2;

“Major Bridge” means a bridge having a total length of more than 60 (sixty) meters between the inner faces of the dirt walls as specified in IRC:5;

“Manual” shall mean the Manual of Standards and Specifications for Project Highways;

“Material Adverse Effect” means a material adverse effect of any act or event on the ability of either Party to perform any of its obligations under and in accordance with the provisions of this Agreement and which act or event causes a material financial burden or loss to either Party;

“Materials” comprise of all the supplies used by the Contractor used in the Works or for the maintenance of the Project Highway;

“Monthly Maintenance Statement” shall have the meaning set forth in Clause 19.6;

“MORTH” means the Ministry of Road Transport and Highways or any substitute thereof of dealing with Highways;

“Non-Political Event” shall have the meaning set forth in Clause 21.2;

“Parties” means the parties to this Agreement collectively and “Party” shall mean any of the parties to this Agreement individually;

“Performance Security” and “Additional Performance Security” shall have the meaning set forth in Clause 7.1;

“Plant” means the apparatus and machinery intended to form or forming part of the works of the Works;

“Political Event” shall have the meaning set forth in Clause 21.4;

“Programme” shall have the meaning set forth in Clause 10.1 (iii);

“Project” means the construction and maintenance of the Project Highway in accordance with the provisions of this Agreement, and includes all works, services and equipment relating to or in respect of the Scope of the Project;

“Project Assets” means all physical and other assets relating to (a) tangible assets such as civil works and equipment including foundations, embankments, pavements, road surface, interchanges, bridges, culverts, road over-bridges, drainage works, traffic signals, sign boards, kilometer-stones, [toll plaza(s)], electrical systems, communication systems, rest areas, relief centers, maintenance depots and administrative offices; and (b) Project Facilities situated on the Site;

“Project Completion Date” means the date on which the Completion Certificate is issued;

“Project Completion Schedule” means the progressive Project Milestones set forth in Schedule-J for completion of the Project Highway on or before the Scheduled Completion Date;

“Project Facilities” means all the amenities and facilities situated on the Site, as described in Schedule-C;

“Project Highway” means the Site comprising the existing road –forming part of [SH-95 from km 0+000 to Km14+125]–and all Project Assets, and its subsequent development and augmentation in accordance with this Agreement;

“Project Milestone” means the project milestone set forth in Schedule-J;

“Proof Consultant” shall have the meaning set forth in Clause 10.2;

“Quality Assurance Plan” or **“QAP”** shall have the meaning set forth in Clause 11.2;

“Re.”, **“Rs.”** or **“Rupees”** or **“Indian Rupees”** or **“INR”** means the lawful currency of the Republic of India;

“Request for Proposals” or **“RFP”** shall have the meaning set forth in Recital ‘C’;

“Retention Money” shall have the meaning set forth in Clause 7.5;

“Right of Way” means and refers to the total land required and acquired for the project, both in its width and length, together with all way leaves, easements, unrestricted access and other rights of way, howsoever described, necessary for construction and maintenance of the Project Highway in accordance with this Agreement;

“Safety Consultant” shall have the meaning set forth in Clause 10.1;

“Scheduled Completion Date” shall be the date set forth in Clause 10.3;

“Scheduled Construction Period” means the period commencing from the Appointed Date and ending on Scheduled Completion Date;

“Scope of the Project” shall have the meaning set forth in Clause 2.1;

“**Section**” means a part of the Project Highway;

“**Site**” shall have the meaning set forth in Clause 8.1;

“**Specifications and Standards**” means the specifications and standards relating to the quality, quantity, capacity and other requirements for the Project Highway, as set forth in Schedule-D, and any modifications thereof, or additions thereto, as included in the design and engineering for the Project Highway submitted by the Contractor to, and expressly approved by, the Authority;

“**Stage Payment Statement**” shall have the meaning set forth in Clause 19.4;

“**Structures**” means an elevated road or a flyover, as the case may be;

“**Sub-contractor**” means any person or persons to whom a part of the Works or the Maintenance has been subcontracted by the Contractor and the permitted legal successors in title to such person, but not an assignee to such person;

“**Suspension**” shall have the meaning set forth in Article 22;

“**Taking Over Certificate**” shall have the meaning set forth in Clause 14.10;

“**Taxes**” means any Indian taxes (direct and indirect taxes) including GST, excise duties, customs duties, value added tax, sales tax, local taxes, Income tax, royalty, cess and any impost or surcharge of like nature (whether Central, State or local) on the goods, Materials, equipment and services incorporated in and forming part of the Project Highway charged, levied or imposed by any Government Instrumentality, but excluding any interest, penalties and other sums in relation thereto imposed on any account whatsoever. For the avoidance of doubt, Taxes shall not include taxes on corporate income;

“**Termination**” means the expiry or termination of this Agreement;

“**Termination Notice**” means the communication issued in accordance with this Agreement by one Party to the other Party terminating this Agreement;

“**Termination Payment**” means the amount payable by either Party to the other upon Termination in accordance with Article 23;

“**Terms of Reference**” or “**TOR**” shall have the meaning set forth in Clause 18.2;

“**Tests**” means the tests set forth in Schedule-K to determine the completion of Works in accordance with the provisions of this Agreement;

“**Time Extension**” shall have the meaning set forth in Clause 10.5;

“**User**” means a person who travels or intends to travel on the Project Highway or any part hereof in/on any vehicle;

“Valuation of Unpaid works” shall have the meaning set forth in Clause 23.5;

“Works” means all works including survey and investigation, design, engineering, procurement, construction, Plant, Materials, maintenance, temporary works and other things necessary to complete the Project Highway in accordance with this Agreement; and

“WPI” means the wholesale price index for various commodities as published by the Ministry of Commerce and Industry, GOI and shall include any index which substitutes the WPI, and any reference to WPI shall, unless the context otherwise requires, be construed as a reference to the WPI published for the period ending with the preceding month.

- (iii) Asian development Bank (ADB) is the financing institution which has provided funds toward a part of the cost of the Project. Payments by the ADB will be made only at the request of the Recipient (State government of Bihar acting through BSRDCL) of the funds and upon approval by the ADB in accordance with the terms and conditions of the financing agreement (Loan Agreement) and will be subject in all respects to the terms and conditions of that Loan Agreement. No party other than the Recipient shall derive any rights from the Loan Agreement or have claim to any funds.

1.2 Interpretation

- (i) In this Agreement, unless the context otherwise requires,
- (a) references to any legislation or any provision thereof shall include amendment or re-enactment or consolidation of such legislation or any provision thereof so far as such amendment or re - enactment or consolidation applies or is capable of applying to any transaction entered into hereunder;
 - (b) references to laws of India or Indian law or regulation having the force of law shall include the laws, acts, ordinances, rules, regulations, bye laws or notifications which have the force of law in the territory of India and as from time to time may be amended, modified, supplemented, extended or re-enacted;
 - (c) references to a “person” and words denoting a natural person shall be construed as a reference to any individual, firm, company, corporation, society, trust, government, state or agency of a state or any association or partnership (whether or not having separate legal personality) of two or more of the above and shall include successors and assigns;
 - (d) the table of contents, headings or sub-headings in this Agreement are for convenience of reference only and shall not be used in, and shall not affect, the construction or interpretation of this Agreement;
 - (e) the words “include” and “including” are to be construed without limitation and shall be deemed to be followed by “without limitation” or “but not limited to” whether or not they are followed by such phrases;
 - (f) references to “construction” or “building” include, unless the context otherwise

requires, survey and investigation, design, developing, engineering, procurement, supply of plant, materials, equipment, labor, delivery, transportation, installation, processing, fabrication, testing, and commissioning of the Project Highway, including maintenance during the Construction Period, removing of defects, if any, and other activities incidental to the construction and “construct” or “build” shall be construed accordingly;

- (g) references to “development” include, unless the context otherwise requires, construction, renovation, refurbishing, augmentation, up-gradation and other activities incidental thereto during the Construction Period, and “develop” shall be construed accordingly;
- (h) any reference to any period of time shall mean a reference to that according to Indian standard time;
- (i) any reference to day shall mean a reference to a calendar day;
- (j) references to a “business day” shall be construed as a reference to a day (other than a Sunday) on which banks in Patna are generally open for business;
- (k) any reference to month shall mean a reference to a calendar month as per the Gregorian calendar;
- (l) references to any date, period or Project Milestone shall mean and include such date, period or Project Milestone as may be extended pursuant to this Agreement;
- (m) any reference to any period commencing “from” a specified day or date and “till” or “until” a specified day or date shall include both such days or dates; provided that if the last day of any period computed under this Agreement is not a business day, then the period shall run until the end of the next business day;
- (n) the words importing singular shall include plural and vice versa;
- (o) references to any gender shall include the other and the neutral gender;
- (p) “lakh” means a hundred thousand (100,000) and “crore” means ten million (10,000,000);
- (q) “indebtedness” shall be construed so as to include any obligation (whether incurred as principal or surety) for the payment or repayment of money, whether present or future, actual or contingent;
- (r) references to the “winding-up”, “dissolution”, “insolvency”, or “reorganization” of a company or corporation shall be construed so as to include any equivalent or analogous proceedings under the law of the jurisdiction in which such company or corporation is incorporated or any jurisdiction in which such company or corporation carries on business including the seeking of liquidation, winding-up,

- reorganization, dissolution, arrangement, protection or relief of debtors;
- (s) save and except as otherwise provided in this Agreement, any reference, at any time, to any agreement, deed, instrument, license or document of any description shall be construed as reference to that agreement, deed, instrument, license or other document as amended, varied, supplemented, modified or suspended at the time of such reference; provided that this Clause shall not operate so as to increase liabilities or obligations of the Authority hereunder or pursuant hereto in any manner whatsoever;
 - (t) any agreement, consent, approval, authorisation, notice, communication, information or report required under or pursuant to this Agreement from or by any Party or the Authority's Engineer shall be valid and effective only if it is in writing under the hand of a duly authorised representative of such Party or the Authority's Engineer, as the case may be, in this behalf and not otherwise;
 - (u) the Schedules and Recitals to this Agreement form an integral part of this Agreement and will be in full force and effect as though they were expressly set out in the body of this Agreement;
 - (v) references to Recitals, Articles, Clauses, Sub-clauses or Schedules in this Agreement shall, except where the context otherwise requires, mean references to Recitals, Articles, Clauses, Sub-clauses and Schedules of or to this Agreement, and references to a Paragraph shall, subject to any contrary indication, be construed as a reference to a Paragraph of this Agreement or of the Schedule in which such reference appears;
 - (w) The damages payable by either Party to the other of them, as set forth in this Agreement, whether on per diem basis or otherwise, are mutually agreed genuine pre-estimated loss and damage likely to be suffered and incurred by the Party entitled to receive the same and are not by way of penalty or liquidated damages (the "Damages"); and
 - (x) Time shall be of the essence in the performance of the Parties' respective obligations. If any time period specified herein is extended for the reasons specified in the Agreement, such extended time shall also be of the essence.
 - (y) Deleted.
- (ii) Unless expressly provided otherwise in this Agreement, any Documentation required to be provided or furnished by the Contractor to the Authority shall be provided free of cost and in three copies, and if the Authority is required to return any such Documentation with its comments and/or approval, it shall be entitled to retain two copies thereof.
 - (iii) The rule of construction, if any, that a contract should be interpreted against the parties responsible for the drafting and preparation thereof, shall not apply.
 - (iv) Any word or expression used in this Agreement shall, unless otherwise defined or construed in this Agreement, bear its ordinary English meaning and, for these purposes, the General

Clauses Act, 1897 shall not apply.

1.3 Measurements and arithmetic conventions

All measurements and calculations shall be in the metric system and calculations done to 2 (two) decimal places, with the third digit of 5 (five) or above being rounded up and below 5 (five) being rounded down.

1.4 Priority of agreements and errors/discrepancies

(i) This Agreement, and all other agreements and documents forming part of or referred to in this Agreement are to be taken as mutually explanatory and, unless otherwise expressly provided elsewhere in this Agreement, the priority of this Agreement and other documents and agreements forming part hereof or referred to herein shall, in the event of any conflict between them, be in the following order:

- (a) this Agreement; and
- (b) all other agreements and documents forming part hereof or referred to herein; i.e. this Agreement at (a) above shall prevail over the agreements and documents at (b).

(ii) Subject to the provisions of Clause 1.4 (i), in case of ambiguities or discrepancies within this Agreement, the following shall apply:

- (a) between two or more Clauses of this Agreement, the provisions of a specific Clause relevant to the issue under consideration shall prevail over those in other Clauses;
- (b) between the Clauses of this Agreement and the Schedules, the Clauses shall prevail and between Schedules and Annexes, the Schedules shall prevail;
- (c) between any two Schedules, the Schedule relevant to the issue shall prevail;
- (d) between the written description on the Drawings and the Specifications and Standards, the latter shall prevail;
- (e) between the dimension scaled from the Drawing and its specific written dimension, the latter shall prevail; and
- (f) between a value written in numerals and that in words, the latter shall prevail.

1.5 Joint and several liability

(i) If the Contractor has formed a Joint Venture of two or more persons for implementing the Project

- (a) these persons shall, without prejudice to the provisions of this Agreement or any other agreement, be deemed to be jointly and severally liable to the Authority for the performance of the Agreement; and

- (b) the Contractor shall ensure that no change in the composition of the Joint Venture is effected without the prior consent of the Authority.
- (ii) Without prejudice to the joint and several liability of all the members of the Joint Venture, the Lead Member shall represent all the members of the Joint Venture and shall always be liable and responsible for discharging the functions and obligations of the Contractor. The Contractor shall ensure that each member of the Joint Venture shall be bound by any decision, communication, notice, action or inaction of the Lead Member on any matter related to this Agreement and the Authority shall be entitled to rely upon any such action, decision or communication of the Lead Member. The Authority shall have the right to release payments solely to the Lead Member and shall not in any manner be responsible or be held liable for the inter se allocation of payments among members of the Joint venture.

Not to be used as a Bid Document, Only for Reference

Part II

Scope of Project

Not to be used as a Bid Document, Only for Reference

Article 2

Scope of the Project

2.1 Scope of the Project

Under this Agreement, the scope of the Project (the “**Scope of the Project**”) shall mean and include:

- (a) construction of the Project Highway on the Site set forth in Schedule –A and as specified in Schedule-B together with provision of Project Facilities as specified in Schedule-C, and in conformity with the Specification and Standards set forth in Schedule-D:
- (b) maintenance of the Project Highway in accordance with the provision of this Agreement and in conformity with the requirements set forth in Schedule-E: and
- (c) performance and fulfillment of all other obligations of the Contractor in accordance with the provisions of this Agreement and matters incidental thereto of necessary for the performance of any or all of the obligations of the Contractor under this Agreement.

Article 3

Obligations of the Authority

3.1 Obligations of the Authority

- (i) The Authority shall, at its own cost and expense, undertake, comply with and perform all its obligations set out in this Agreement or arising hereunder.
- (ii) The Authority shall be responsible for the correctness of the Scope of the Project, Project Facilities, Specifications and Standards and the criteria for testing of the completed Works.
- (iii) The Authority shall, upon submission of the Performance Security as per the RFP (EPC Agreement) by the Contractor, shall provide to the Contractor:
 - (a) No less than 90% (Ninety per cent) of the required Right of Way of the Construction Zone of total length of the Project Highway within a period of 30 (thirty) days from the date of this Agreement, which shall be in continuous stretches of length not less than 500 m or mutually agreed
 - (b) approval of the general arrangement drawings (the "GAD") from railway authorities to enable the Contractor to construct road over-bridges/ under bridges at level crossings on the Project Highway in accordance with the Specifications and Standards, and subject to the terms and conditions specified in such approval, within a period of 120 (One Hundred Twenty) days from the Appointed Date, and reimbursement of all the costs and expenses paid by the Contractor to the railway authorities for and in respect of the road over bridges/ under bridges; and
 - (c) all environmental clearances as required under Clause 4.3 are not required to be obtained.
- (iii) Delay in providing the Right of Way or approval of GAD by railway authorities, as the case may be, in accordance with the provisions of Clause 3.1 (iii) shall entitle the Contractor to Damages in a sum calculated in accordance with the provisions of Clause 8.3 of this Agreement and Time Extension in accordance with the provisions of Clause 10.5 of this Agreement. For the avoidance of doubt, the Parties agree that the Damages for delay in approval of GAD by the railway authorities for a particular road over-bridge/ under-bridge shall be deemed to be equal to the Damages payable under the provisions of Clause 8.3 for delay in providing Right of Way for a length of 2 (two) kilometre for each such road over-bridge/ under-bridge.
- (iv) Delay in providing the Right of Way, in accordance with the provisions of Clause 3.1 (iii) shall entitle the Contractor to Damages in a sum calculated in accordance with the provisions of Clause 8.3 of this Agreement and Time Extension in accordance with the provisions of Clause 10.5 of this Agreement.
- (v) Notwithstanding anything to the contrary contained in this Agreement, the Parties expressly agree that the aggregate Damages payable under Clauses 3.1 (iv), 8.3 and

9.5 shall not exceed 1% (one per cent) of the Contract Price. For the avoidance of doubt, the Damages payable by the Authority under the aforesaid Clauses shall not be additive if they arise concurrently from more than one cause but relate to the same part of the Project Highway.

Both the parties agree that payment of such Damages shall be full and final settlement of all claims of the Contractor and such compensation shall be the sole remedy against delays of the Authority and both parties further agree that the payment of Damages shall be the final cure for the Contractor against delays of the Authority, without recourse to any other payments.

- (vi) The Authority agrees to provide support to the Contractor and undertakes to observe, comply with and perform, subject to and in accordance with the provisions of this Agreement and the Applicable Laws, the following:
- (a) upon written request from the Contractor, and subject to the Contractor complying with Applicable Laws, provide reasonable support to the Contractor in procuring Applicable Permits required from any Government Instrumentality for implementation of the Project;
 - (b) upon written request from the Contractor, provide reasonable assistance to the Contractor in obtaining access to all necessary infrastructure facilities and utilities, including water and electricity at rates and on terms no less favorable than those generally available to commercial customers receiving substantially equivalent services;
 - (c) procure that no barriers that would have a material adverse effect on the works are erected or placed on or about the Project Highway by any Government Instrumentality or persons claiming through or under it, except for reasons of Emergency, national security, law and order or collection of inter-state taxes;
 - (d) not do or omit to do any act, deed or thing which may in any manner violate any provision of this Agreement;
 - (e) support, cooperate with and facilitate the Contractor in the implementation of the Project in accordance with the provisions of this Agreement; and
 - (f) upon written request from the Contractor and subject to the provisions of Clause 4.3, provide reasonable assistance to the Contractor and any expatriate personnel of the Contractor or its Sub-contractors to obtain the applicable visas and the requisite work permits for the purposes of discharge by the Contractor or its Sub-contractors of their obligations under this Agreement and the agreements with the Sub-contractors.

3.2 Maintenance obligations prior to the Appointed Date

The Authority shall, prior to the Appointed Date, maintain the Project Highway, at its own cost and expense, so that its traffic worthiness and safety are at no time materially inferior as compared to its condition 10 (ten) days prior to the last date for submission of the Bid, and in the event of any material deterioration or damage other than normal wear and tear, undertake repair thereof. For the avoidance of doubt, the Authority shall undertake only routine maintenance prior to the Appointed Date, and it shall undertake special repairs only in the event of excessive deterioration or damage caused due to unforeseen events such as floods or earthquake.

3.3 Environmental Clearances

The Authority represents and warrants that the environmental clearances required for construction of the Project shall be procured by the Authority prior to the date of issue of LOA. For the avoidance of doubt, the present status of environmental clearances is specified in Schedule-A.

3.4 Deemed Termination upon Delay - Deleted

Article 4

Obligations of the Contractor

4.1 Obligations of the Contractor

- (i) Subject to and on the terms and conditions of this Agreement, the Contractor shall undertake the survey, investigation, design, engineering, procurement, construction, and maintenance of the Project Highway and observe, fulfil, comply with and perform all its obligations set out in this Agreement or arising hereunder.
- (ii) The Contractor shall comply with all Applicable Laws and Applicable Permits (including renewals as required) in the performance of its obligations under this Agreement.
- (iii) Subject to the provisions of Clauses 4.1 (i) and 4.1 (ii), the Contractor shall discharge its obligations in accordance with Good Industry Practice and as a reasonable and prudent person.
- (iv) The Contractor shall remedy any and all loss, defects, or damage to the Project Highway from the Appointed Date until the end of the Construction Period at the Contractor's cost, save and except to the extent that any such loss, defect, or damage shall have arisen from any willful default or neglect of the Authority.
- (v) The Contractor shall remedy any and all loss, defect or damage to the Project Highway during the Defects Liability Period at the Contractor's cost to the extent that such loss, defect or damage shall have arisen out of the reasons specified in Clause 17.3.
- (vi) The Contractor shall remedy any and all loss or damage to the Project Highway during the Maintenance Period at the Contractor's cost, including those stated in Clause 14.1 (ii), save and except to the extent that any such loss or damage shall have arisen on account of any willful default or neglect of the Authority or on account of a Force Majeure Event.
- (vii) The Contractor shall, at its own cost and expense, in addition to and not in derogation of its obligations elsewhere set out in this Agreement:
 - (a) make, or cause to be made, necessary applications to the relevant Government Instrumentalities with such particulars and details as may be required for obtaining Applicable Permits set forth in Schedule-F and obtain and keep in force and effect such Applicable Permits in conformity with the Applicable Laws;

- (b) procure, as required, the appropriate proprietary rights, licenses, agreements and permissions for Materials, methods, processes and systems used or incorporated into the Project Highway;
 - (c) make reasonable efforts to maintain harmony and good industrial relations among the personnel employed by it or its Sub-contractors in connection with the performance of its obligations under this Agreement;
 - (d) ensure and procure that its Sub-contractors comply with all Applicable Permits and Applicable Laws in the performance by them of any of the Contractor's obligations under this Agreement;
 - (e) not do or omit to do any act, deed or thing which may in any manner violate any provisions of this Agreement;
 - (f) support, cooperate with and facilitate the Authority in the implementation and operation of the Project in accordance with the provisions of this Agreement;
 - (g) ensure that the Contractor and its Sub-contractors comply with the safety and welfare measures for labour in accordance with the Applicable Laws and Good Industry Practice;
 - (h) keep, on Site, a copy of this Agreement, publications named in this Agreement, the Drawings, Documents relating to the Project, and Change of Scope orders and other communications given under this Agreement. The Authority's Engineer and its authorized personnel shall have the right of access to all these documents at all reasonable times;
 - (i) cooperate with other contractors employed by the Authority and personnel of any public authority; and
 - (j) not interfere unnecessarily or improperly with the convenience of the public, or the access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the Authority or of others.
- (viii) The Contractor shall undertake all necessary superintendence to plan, arrange, direct, manage, inspect and test the Works. The Contractor shall provide all necessary superintendence of the Works for the proper fulfilling of the Contractor's obligations under the Agreement. Such superintendence shall be given by competent person having adequate knowledge of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents) for the satisfactory and safe execution of the Works.

- (ix) The Contractor shall obtain and maintain a project related bank account operational at site where all transactions related to the payment of work will be done. The Contractor shall submit a monthly account statement and a detailed report on utilization of funds transferred to this project related bank account to Authority's Engineer. Notwithstanding anything contrary to this agreement, the authority, in the interest and to ensure timely completion of the work, reserves the right to audit such bank accounts to ensure that there is no diversion of funds from this project specific account to any other project being implemented by the Contractor.
- (x) The Contractor shall provide the documents of the Contractor specified in the Agreement, and all Contractors' personnel; Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for the execution, completion of Works and remedying defects.
- (xi) The Contractor shall perform the Works in conformity with the Project requirements and other requirements and standards prescribed under or pursuant to the Agreement.
- (xii) The Contractor shall carry out such work incidental and contingent to the original Scope of the Project to comply with Good Industry Practices.
- (xiii) The Contractor shall maintain required staff and necessary Contractor's equipment and materials within the reach of the Site during the Defects Liability Period so that any defects arising are promptly attended.

(xiv) **Eligibility:**

All equipment, material, and services to be incorporated in or required in performing the EPC Contract shall have their origin in any eligible source country as defined by the Asian Development Bank (ADB), as shown in Section 5 of the Bidding Document.

(xv) **Inspection and Audit by the Asian Development Bank:**

The Contractor shall permit the Asian Development Bank (ADB) or its representative to inspect the Contractor's site, assets, accounts and records and other documents relating to the bid submission and contract performance of the Contractor and to have them audited by auditors appointed by ADB, if so required by ADB.

ADB's right to inspect the Site and/or the Contractor's accounts and records relating to the performance of the Contract stated in shall survive termination of this Contract.

4.2 (i) **Obligations relating to sub-contracts and any other agreements**

The Contractor, whether Joint Venture or sole, shall not sub-contract any Works in more than **49% (forty nine percent)** of the Contract Price and shall carry out Works

directly under its own supervision and through its own personnel and equipment in **at least 51% (fifty one per cent)** of the Contract Price. Further, in case the Contractor is a Joint Venture, then the Lead Member shall carry out Works directly through its own resources (men, material and machines etc.) in **at least 51% (fifty one percent)** of total length of the Project Highway. Provided, however, that in respect of the Works carried out directly by the Contractor, it may enter into contracts for the supply and installation of Materials, Plant, equipment, road furniture, safety devices and labour, as the case may be, for such Works. For the avoidance of doubt, the Parties agree that the Contractor may sub-divide the aforesaid length of **51% (fifty one percent)** in no more than 5 (five) sections of the Project Highway. The Parties further agree that all obligations and liabilities under this Agreement for the entire project Highway shall at all times remain with the Contractor.

- (ii) In the event any sub-contract for Works, or the aggregate of such sub-contracts with any Sub-contractor, exceeds 5% (five percent) of the Contract Price, the Contractor shall communicate the name and particulars, including the relevant experience of the Sub-contractor, to the Authority prior to entering into any such sub-contract. The Authority shall examine the particulars of the Sub-contractor from the national security and public interest perspective and may require the Contractor, no later than 15 (fifteen) business days from the date of receiving the communication from the Contractor, not to proceed with the sub-contract, and the Contractor shall comply therewith.
- (iii) In the event any sub-contract referred to in Clause 4.2 (ii) relates to a Sub-contractor who has, over the preceding 3 (three) years, not undertaken at least one work of a similar nature with a contract value exceeding 40% (forty per cent) of the value of the sub-contract to be awarded hereunder, and received payments in respect thereof for an amount equal to at least such 40% (forty per cent), the Authority may, no later than 15 (fifteen) business days from the date of receiving the communication from the Contractor, require the Contractor not to proceed with such sub-contract, and the Contractor shall comply therewith without delay or demur.
- (iv) It is expressly agreed that the Contractor shall, at all times, be responsible and liable for all its obligations under this Agreement notwithstanding anything contained in the agreements with its Sub-contractors or any other agreement that may be entered into by the Contractor, and no default under any such agreement shall excuse the Contractor from its obligations or liability under this Agreement. However, in case of non-compliance of the Contractor towards his obligations for payments to the approved Sub-contractor(s), which is likely to affect the progress of works, the authority reserves the right to intervene and direct the Contractor to release such outstanding payments to approved Sub-contractor(s) out of the payments due for the completed Works in the interest of work.

4.3 Employment of foreign nationals

The Contractor acknowledges, agrees and undertakes that employment of foreign personnel by the Contractor and/or its Sub-contractors and their sub- contractors shall be subject to grant of requisite regulatory permits and approvals including employment/ residential visas and work permits, if any required, and the obligation to apply for and obtain the same shall always rest with the Contractor. Notwithstanding anything to the contrary contained in this Agreement, refusal of or inability to obtain any such permits and approvals by the Contractor or any of its Sub-contractors or their sub-contractors shall not constitute a Force Majeure Event, and shall not in any manner excuse the Contractor from the performance and discharge it of its obligations and liabilities under this Agreement, and the Contractor's liabilities hereunder shall remain unaffected by such failure, refusal or inability.

4.4 Contractor's personnel

- (i) The Contractor shall ensure that the personnel engaged by it or by its Sub-contractors in the performance of its obligations under this Agreement are at all times appropriately and adequately qualified, skilled and experienced in their respective functions in conformity with Good Industry Practice. The Contractor will try to hire at least 10% (ten percent) trained workmen as per the National Skills Qualifications Framework. If necessary, the requisite workmen may be got trained by the Contractor at his cost through authorized training centers of the Directorate General of Training (DGT). The Contractor will organize training at project site/ sites for the trainees as and when required as per the training schedule finalized in consultation with the training centers. The trainees shall be paid stipend by the Contractor (subject to a maximum of Rs. 15,000/- per person) on the basis of minimum wages to compensate for loss of income during the training period.
- (ii) The Authority's Engineer may, for reasons to be specified in writing, direct the Contractor to remove any member of the Contractor's or Sub-contractor's personnel provided that any such direction issued by the Authority's Engineer shall specify the reasons for the removal of such person.
- (iii) The Contractor shall on receiving such a direction from the Authority's Engineer order for the removal of such person or persons with immediate effect. It shall be the duty of the Contractor to ensure that such persons are evicted from the Site within 10 (ten) days of any such direction being issued in pursuance of Clause 4.4 (ii). The Contractor shall further ensure that such persons have no further connection with the Works or Maintenance under this Agreement. The Contractor shall then appoint (or cause to be appointed) a replacement.

4.5 Advertisement on Project Highway

The Project Highway or any part thereof shall not be used in any manner to advertise any commercial product or services.

4.6 Contractor's care of the Works

The Contractor shall bear full risk in, and take full responsibility for, the care of the Works, and of the Materials, goods and equipment for incorporation therein, from the Appointed Date until the date of Completion Certificate, save and except to the extent that any such loss or damage shall have arisen from any willful default or gross neglect of the Authority.

4.7 Electricity, water and other services

The Contractor shall be responsible for procuring of all utilities as may be required, including without limitation, adequate power, water and other services.

4.8 Unforeseeable difficulties

Except as otherwise stated in the Agreement:

- (a) The Contractor accepts complete responsibility for having foreseen all difficulties and costs of successfully completing the Works;
- (b) The Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs; and
- (c) The Scheduled Completion Date shall not be adjusted to take account of any unforeseen difficulties or costs.

4.9 Corrupt and Fraudulent Practices:

If the Employer determines, based on reasonable evidence, that the Contractor has engaged in corrupt, fraudulent, collusive or coercive practices, or other integrity violations, including the failure to disclose any required information which constitutes a fraudulent practice, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contract and expel him from the Site, and the provisions of Clause 15 shall apply as if such termination had been made under Sub-Clause 23.1 .

Should any employee of the Contractor be determined, based on reasonable evidence, to have engaged in corrupt, fraudulent or coercive practice or other integrity violations during the execution of the work then that employee shall be removed in accordance with Sub-Clause 4.4(ii).

For the purposes of this Subclause:

ADB requires Borrowers (including beneficiaries of ADB-financed activity) and their personnel, as well as firms and individuals participating in an ADB-financed activity, including but not limited to, Bidders, Suppliers, Contractors, agents, subcontractors, subconsultants, service providers, subsuppliers, manufacturers (including their respective

officers, directors, employees and personnel) under ADB-financed contracts to observe the highest standard of ethics during the procurement and execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). In pursuance of this policy, ADB

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
- (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
 - (ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
 - (iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
 - (iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;
 - (v) "abuse" means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard.
 - (vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and
 - (vii) "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, violations of ADB sanctions, retaliation against whistle blowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.
- (b) will reject a proposal for award if it determines that the Bidder recommended for award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;
- (c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation, including by failing to inform ADB in a timely manner at the time they knew of the integrity violations;

- (d) *will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines, including declaring ineligible, either indefinitely or for a stated period of time, to participate (whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity) in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations; and*
- (e) *will have the right to require that a provision be included in bidding documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers and contractors, consultants, manufacturers, service providers and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, to permit ADB or its representative to inspect the site and their assets, accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.*

All Bidders, consultants, contractors, suppliers, manufacturers, service providers and other third parties engaged or involved in ADB-related activities and their respective officers, directors, employees and personnel, are obliged to cooperate fully in any investigation when requested by ADB to do so. As determined on a case by case basis by ADB, such cooperation includes, but is not limited to, the following:

- (a) *being available to be interviewed and replying fully and truthfully to all questions asked;*
- (b) *providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;*
- (c) *upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;*
- (d) *cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);*
- (e) *cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and*
- (f) *preserving and protecting confidentiality of all information discussed with, and as required by, ADB.*

All Bidders, consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contracts with its sub-consultants, Subcontractors, and other third parties engaged or involved in ADB-related activities, such sub-consultants, Subcontractors, and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.

The Contractor undertakes that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the bid, have been given or received in connection with the procurement process or in the contract execution. The undertaking also applies during the period of performance of the contract.

4.10 Co-ordination of the Works

- (i) The Contractor acknowledges that in addition to the Agreement, it is also aware of terms of the other Project contracts and other agreements the Authority has negotiated and entered into for performance of its obligations under the Agreement (copies of other contracts and other agreements are made available to the Contractor from time to time) and that the Contractor is fully aware of the consequences to the Authority which would or are likely to result from a breach by the Contractor of its obligations under the Agreement. In the event the actions of the Contractor result in the breach by the Authority of any or all of the other Project contracts and such breach imposes any liability on the Authority, the Contractor shall: (a) undertake all steps as may be possible to mitigate or neutralize the liability that has arisen, and (b) indemnify the Authority against any such liability and compensate the Authority to that extent.
- (ii) The Contractor shall be responsible for the co-ordination and proper provision of the Works, including co-ordination of other Contractors or Sub-contractors for the Project. The Contractor shall co-operate with the Authority in the co-ordination of the Works with the works under the other Project contracts. The Contractor shall provide all reasonable support for carrying out their work to:
 - (a) any other contractors employed by the Authority;
 - (b) the workmen of the Authority;
 - (c) the workmen of any Governmental instrumentality who may be employed in the execution of work on or near the Site; and
 - (d) such other persons as is required in the opinion of the Authority for successful completion of the Project.

4.11 Environmental Measures

- (i) The Contractor agrees to conduct its activities in connection with the Agreement in such a manner so as to comply with the environmental requirements which includes, inter alia, all the conditions required to be satisfied under the environmental clearances and applicable law, and assume full responsibility for measures which are required to be taken to ensure such compliance.

4.12 Site Data

- (i) The Contractor shall be deemed to have inspected and examined the Site and its surroundings and to have satisfied himself before entering into the Agreement in all material respects including but not limited to:
 - (a) the form and nature of the Site (including, inter-alia, the surface and sub-surface conditions and geo-technical factors);
 - (b) the hydrological and climatic conditions;
 - (c) the extent and nature of the works already completed and Materials necessary for the execution and completion of the Works and the remedying of any defects that includes already executed part also.
 - (d) the suitability and the adequacy of the Site for the execution of the Works;
 - (e) the means of access to the Site and the accommodation the Contractor may require;
 - (f) arranging permits as required as per [.] of the Agreement.
 - (g) the requirements of operation and maintenance; and
 - (h) all other factors and circumstances affecting the Contractor's rights and obligations under the Agreement, the Contract Price and Time for Completion.

4.13 Sufficiency of Contract Price

The Contractor shall have satisfied itself as to the correctness and sufficiency of the Contract Price. The Contract Price shall cover all its obligations under the Agreement, in addition to all risks the Contractor has agreed to undertake under the Agreement, including those associated with the performance of its obligations under the Agreement and all things necessary for the provision of the Works in a manner satisfactory to the Authority and in accordance with this Agreement.

4.14 Clearance of the Site

During the provision of the Works, and as a pre-condition to the issue of the Taking-Over Certificate, the Contractor shall clear away and remove from the Site, all Contractor's equipment, surplus material, wreckage, rubbish and temporary Works, and shall keep the Site free from all unnecessary obstructions, and shall not store or dispose of any Contractor's equipment or surplus materials on the Site. The Contractor shall promptly clear away and remove from the Site any wreckage, rubbish or temporary Works no longer required and leave the Site and the Works in a clean and safe condition to the sole satisfaction of the Authority.

4.15 Protection of the Environment:

The Contractor shall comply with all applicable national, provincial, and local environmental laws and regulations.

The Contractor shall also comply with all reasonable requests of the national and local authorities responsible for enforcing environmental controls.

Before commencing the works at the Site, the Contractor shall submit a detailed Site Specific Environmental Management Plan (SSEMP), based on the Environmental Health and Safety Management Plan submitted in the technical proposal, for the Engineer's no objection showing how the Contractor intends to comply with environmental laws and regulations and other specific requirements prescribed in the Contract, addressing all the monitoring and mitigation measures set forth in the Environmental Impact Assessment ("EIA") and the Environmental Management Plan ("EMP") of the project attached hereto as Appendix-D1 of Annexure-1 of Schedule-D. Work shall not commence on the Site until the no objection of SSEMP has been obtained from the Engineer and is being implemented.

The Contractor shall (a) establish an operational system for managing environmental impacts, (b) comply with the approved SSEMP and any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor the implementation of the project EMP through the SSEMP, (c) allocate the budget required to ensure that such measures, requirements and actions are carried out, (d) submit semi-annual reports on the compliance of such measures to the Employer.

Where unanticipated environmental risks or impacts become apparent during the Contract, the Contractor is required to update the SSEMP to outline the potential impacts to site works and associated mitigation measures for the Engineer's approval.

4.16 The Contractor shall provide the Engineer with a written notice of any unanticipated environmental or resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Works, which were not considered in the Environmental Impact Assessment, the environmental management plan, the resettlement plan or the indigenous peoples plan. Resettlement plan is attached here to as Appendix-D3 of Annexure-1 of Schedule-D.

4.17 The Contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The Contractor shall base the employment relationship upon equal opportunity and fair treatment and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement and discipline. The contractor shall provide equal wages and benefits to men and women for equal value for equal value or type.

4.18 The Contractor shall (a) (i) carry out HIV/AIDS awareness programs through implementation support consultants for labor and disseminate information at worksites on risks of sexually transmitted disease and HIV/AIDS as part of health and safety measures to those employed

during construction; and in Project influenced areas (ii) follow and implement all statutory provisions on labor (including equal pay for equal work), health safety, welfare, sanitation and working conditions; and (b) encourage increased employment of women and local poor and disadvantaged persons for construction purposes, provided that the requirements for efficiency are adequately met. Breach of this provision shall be cause for termination of the Contract.

4.19 The Contractor shall not employ any child to perform any work, including work that is economically exploitative, or is likely to be hazardous to, or interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development. "Child" means a child below the statutory minimum age specified under applicable national law.

4.20 Health and Safety :

The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

The Contractor is responsible for establishment of preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks of the construction site work to the health and safety of local communities.

Within 28 days of the Commencement Date the Contractor shall submit a detailed Site Specific Health and Safety Management Plan (SSHSMMP), based on the Environmental Health and Safety Management Plan submitted in the technical proposal, for the Engineer's no objection showing how he/she intends to comply with the local Health and Safety laws and regulations and other specific requirements prescribed in the Contract, taking into account the Supplementary Information in Section 6- Employer's Requirements. Work shall not commence on the Site until the confirmation of no objection of the SSHSMMP has been obtained from the Engineer and is being implemented.

Where unanticipated health and safety hazards or risks become apparent during the Contract, the Contractor is required to update the SSHSMMP to outline the potential impacts to site works and associated mitigation measures for the Engineer's no objection.

The Contractor shall comply with the approved SSHSMMP and any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor the implementation of the project EMP through the SSHSMMP.

In particular, the Contractor is required to provide all personnel on site including Employer's Personnel and visitors with personal protective equipment, including protection for feet (safety boots), head, eyes, ears (safety helmets) and hands, etc. , in

accordance with the Contractor's SSHSMP. The Contractor should ensure that his Subcontractors comply with the SSHSMP and provide all such necessary equipment to their personnel.

The Contractor shall bear the costs to ensure that such measures, requirements and actions are carried out.

The Contractor shall submit semi-annual reports on the compliance of such measures to the Employer.

The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.

In the event of a significant injury involving medical treatment or hospitalization and fatal accident the Contractor shall notify the Engineer immediately by verbal communication and submit a formal report as soon as practicable after its occurrence. For all accidents, whether fatal or not, the Contractor shall also notify the appropriate local authorities in accordance with the Laws of the Country.

HIV-AIDS Prevention. The Contractor shall conduct an HIV-AIDS awareness programme via an approved service provider, and shall undertake such other measures as are specified in this Contract to reduce the risk of the transfer of the HIV virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals.

The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labour (including all the Contractor's employees, all Subcontractors and any other Contractor's or Employer's personnel, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behaviour with respect to, of Sexually Transmitted Diseases (STD) - or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labour as appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counselling and referral to a dedicated national STI and HIV/AIDS programme, (unless otherwise agreed) of all Site staff and labour.

The Contractor shall include in the programme to be submitted for the execution of the Works under the Contract an alleviation programme for Site staff and labour and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (STD) including HIV/AIDS. The STI, STD and HIV/AIDS alleviation programme shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related specification. For each component, the programme shall detail the resources to be provided or utilised and any related sub-contracting proposed. The programme shall also include provision of a detailed cost estimate with supporting documentation. Payment to the Contractor for preparation and implementation this programme shall not exceed the Provisional Sum dedicated for this purpose.

4.21 Respectful Work Environment:

The Contractor shall ensure that its employees and Subcontractors observe the highest ethical standards and refrain from any form of bullying, discrimination, misconduct and harassment, including sexual harassment; and shall, at all times, behave in a manner that creates an environment free of unethical behavior, bullying, misconduct, and harassment, including sexual harassment. The Contractor shall take appropriate action against any employees or subcontractors, including suspension or termination of employment or subcontract, if any form of unethical or inappropriate behavior is identified.

The Contractor shall conduct training programs for its employees and Subcontractors to raise awareness on and prevent any form of bullying, discrimination, misconduct, and harassment including sexual harassment, and to promote a respectful work environment. The Contractor shall keep an up-to-date record of its employees and Subcontractors who have attended and completed such training programs and provide such records to the Employer or the Engineer at their first written request.

Article 5

Representations and Warranties

5.1 Representations and warranties of the Contractor

- (i) The Contractor represents and warrants to the Authority that:
 - (a) it is duly organized and validly existing under the laws of India, and has full power and authority to execute and perform its obligations under this Agreement and to carry out the transactions contemplated hereby;
 - (b) it has taken all necessary corporate and/or other actions under Applicable Laws to Authorize the execution and delivery of this Agreement and to validly exercise its rights and perform its obligations under this Agreement;
 - (c) this Agreement constitutes its legal, valid and binding obligation, enforceable against it in accordance with the terms hereof, and its obligations under this Agreement will be legally valid, binding and enforceable against it in accordance with the terms hereof;
 - (d) it is subject to the laws of India, and hereby expressly and irrevocably waives any immunity in any jurisdiction in respect of this Agreement or matters arising thereunder including any obligation, liability or responsibility hereunder;
 - (e) the information furnished in the Bid, Request for Qualification and Request for Proposals or otherwise and as updated on or before the date of this Agreement is true and accurate in all respects as on the date of this Agreement;
 - (f) the execution, delivery and performance of this Agreement will not conflict with, or result in the breach of, or constitute a default under, or accelerate performance required by any of the terms of its memorandum and articles of association or any Applicable Laws or any covenant, contract, agreement, arrangement, understanding, decree or order to which it is a party or by which it or any of its properties or assets is bound or affected;
 - (g) there are no actions, suits, proceedings, or investigations pending or, to its knowledge, threatened against it at law or in equity before any court or before any other judicial, quasi-judicial or other authority, the outcome of which may result in the breach of this Agreement or which individually or in the aggregate may result in any material impairment of its ability to perform any of its obligations under this Agreement;
 - (h) it has no knowledge of any violation or default with respect to any order, writ, injunction or decree of any court or any legally binding order of any Government Instrumentality which may result in any material adverse effect on its ability to perform its obligations under this Agreement and no fact or circumstance exists which may give rise to such proceedings that would adversely affect the performance of its obligations under this Agreement;
 - (i) it has complied with Applicable Laws in all material respects and has not been subject to

any fines, penalties, injunctive relief or any other civil or criminal liabilities which in the aggregate have or may have a material adverse effect on its ability to perform its obligations under this Agreement;

- (j) no representation or warranty by it contained herein or in any other document furnished by it to the Authority or to any Government Instrumentality in relation to Applicable Permits contains or will contain any untrue or misleading statement of material fact or omits or will omit to state a material fact necessary to make such representation or warranty not misleading;
 - (k) no sums, in cash or kind, have been paid or will be paid, by it or on its behalf, to any person by way of fees, commission or otherwise for securing the contract or entering into this Agreement or for influencing or attempting to influence any officer or employee of the Authority in connection therewith;
 - (l) nothing contained in this Agreement shall create any contractual relationship or obligation between the Authority and any Sub- contractors, designers, consultants or agents of the Contractor;
 - (m) it is adequately financed has the requisite knowledge, expertise, technical know-how, experience, resources, infrastructure, licenses, patents, copy right, for designing, supplying/ procuring the goods and materials, and for providing the installation and construction services required for completing the construction of the Project Facilities; and
- (ii) It represents the Authority that:
- (a) it owns or has the right to use all “**Intellectual Property**” necessary to perform the contractual obligations and to carry on the Works without conflict with the right of others;
 - (b) All intellectual property rights necessary to perform the contractual obligations and to carry on the Works are in full force and effect and are vested in, and beneficially owned by the Contractor, and are free from encumbrances.
 - (c) None of the intellectual property rights is being used, claimed, or posed or attacked by any other person, nor does the use of such intellectual property rights or any part of them infringe the intellectual property rights owned or enjoyed by any third party.
 - (d) None of the intellectual property rights owned or used by the Contractor is the subject of any claim, opposition, attack, assertion or other arrangement of whatsoever nature which does or may impinge upon their use, validity, enforceability or ownership by the Parties, and there are no grounds or other circumstances which may give rise to the same.
 - (e) No licenses or registered user or other rights have been granted or agreed to be granted to any third party in respect of such intellectual property rights.
 - (f) No act has been done or has been omitted to be done to entitle any authority or person to

cancel, forfeit or modify any intellectual property rights.

- (g) The Contractor shall notify the Authority of any adverse use of the intellectual property rights or confusingly or deceptively similar to the intellectual property rights.
- (h) The Contractor shall recognize the Authority's ownership and title to the intellectual property rights and shall not at any time, either directly or indirectly, put to issue the validity or ownership of the intellectual property rights and it will not do any act or thing, either directly or indirectly, which in anyway impairs the validity and ownership of the intellectual property rights.
- (i) The Contractor shall, promptly execute, acknowledge and deliver all documents which are requested by Authority to record with appropriate governmental agencies and authorities the fact that the Authority has the right to the use of the said intellectual property rights.
- (j) The Contractor shall not, for any reason, object to, or interfere in any way with the ownership, registration or use of the intellectual property rights by the Authority (or its licensee or assigns) for any purpose whatsoever.
- (iii) The Contractor is fully aware that the Agreement is inter linked with the other Project contracts and the non-performance or deficient performance or default by the Contractor and/or any of the Contractor's personnel or Subcontractors under one among the said contracts will have bearing on the other contracts and the evaluation of the Contractor's performance under the Agreement and the Project itself.
- (iv) If at any time during the Defects Liability Period any item of the Works or Project Facilities or any part thereof, do not conform to the Authority requirements and Specifications and Standards, on being so notified by the Authority, the Contractor shall promptly rectify/remedy such nonconformity to the satisfaction of the Authority solely at the Contractor's expense; failing which the Authority may reject or revoke Taking-Over Certificate, and the Authority may proceed to correct the Contractor's nonconforming Work by the most expeditious means available, the costs of which shall be to the Contractor's account; or the Authority may retain the non-conforming Work and an equitable adjustment reducing the total Contract Price to reflect the diminished value of such non-conforming Work will be made by written amendment.
- (v) In addition to the other warranties, the Contractor represents and warrants as follows:
 - (a) The Contractor has (or, if the technology does not currently exist, will have granted at the time of passing to The Employer) in and to the technology used in the equipment, materials, goods, Works, Contractor's documents, Drawings and Manuals ("Technology")
 - i. all right, title and interest free of any lien, claim or restriction; and
 - ii. right to grant to the Authority the right to use the Technology for the purpose of this contract, free of any lien, claim or restriction and on the terms of license as required.

- (b) The Contractor has granted (or, if the technology does not currently exist, will grant at the time of passing to the Authority the property and title in and to the equipment, materials, goods, Works, spares, Contractor's documents, Drawings and Manuals in which it is used) to the Authority the right to use the Technology, free of any lien, claim or restriction.
- (vi) In addition to the other Warranties, the Contractor represents and warrants as follows:
- (a) No Technology contains any worm (i.e., a program that travels from one computer to another computer but does not attach itself to the operating system of the computer it enters), virus (i.e., a program that travels from one computer to another computer that attaches itself to the operating system it enters) or self-destruct capability.
- (b) The Technology will not abnormally end or provide invalid or incorrect results as a result of date-dependent data.
- (c) The Technology can accurately recognize, manage, accommodate, and manipulate date-dependent data, including single and multi-century formulas and leap years.
- (vii) No criminal proceedings instituted against any of the employees or Directors of the Contractor.
- (viii) Till date the services of the Contractor has not been terminated by any person for any breach or non-performance or negligence by the Contractor.

5.2 Representations and warranties of the Authority

The Authority represents and warrants to the Contractor that:

- (a) it has full power and authority to execute, deliver and perform its obligations under this Agreement and to carry out the transactions contemplated herein and that it has taken all actions necessary to execute this Agreement, exercise its rights and perform its obligations, under this Agreement;
- (b) it has taken all necessary actions under the Applicable Laws to authorise the execution, delivery and performance of this Agreement;
- (c) it has the financial standing and capacity to perform its obligations under this Agreement;
- (d) this Agreement constitutes a legal, valid and binding obligation enforceable against it in accordance with the terms hereof;
- (e) it has no knowledge of any violation or default with respect to any order, writ, injunction or any decree of any court or any legally binding order of any Government Instrumentality which may result in any material adverse effect on the Authority's ability to perform its obligations under this Agreement;

- (f) it has complied with Applicable Laws in all material respects;
- (g) it has good and valid right to the Site and has the power and authority to grant the Right of Way in respect thereof to the Contractor; and
- (h) it has procured Right of Way and environment clearances such that the Contractor can commence construction forthwith on 80% (eighty per cent) of required area of Right of Way of the total length of the Project Highway.

5.3 Disclosure

In the event that any occurrence or circumstance comes to the attention of either Party that renders any of its aforesaid representations or warranties untrue or incorrect, such Party shall immediately notify the other Party of the same. Such notification shall not have the effect of remedying any breach of the representation or warranty that has been found to be untrue or incorrect nor shall it adversely affect or waive any obligation no of either Party under this Agreement.

Not to be used as a Bid Document, Only for Reference

Article 6

Disclaimer

6.1 Disclaimer

- (i) The Contractor acknowledges that prior to the execution of this Agreement, the Contractor has, after a complete and careful examination, made an independent evaluation of the Request for Proposal, Scope of the Project, Specifications and Standards of design, construction and maintenance, Site, local conditions, physical qualities of ground, subsoil and geology, traffic volumes, suitability and availability of access routes to the Site and all information provided by the Authority or obtained, procured or gathered otherwise, and has determined to its satisfaction the accuracy or otherwise thereof and the nature and extent of difficulties, risks and hazards as are likely to arise or may be faced by it in the course of performance of its obligations hereunder. Save as provided in Clause 3.1 and Clause 5.2, the Authority makes no representation whatsoever, express, implicit or otherwise, regarding the accuracy, adequacy, correctness, reliability and/or completeness of any assessment, assumptions, statement or information provided by it and the Contractor confirms that it shall have no claim whatsoever against the Authority in this regard.
- (ii) The Contractor acknowledges and hereby accepts to have satisfied itself as to the correctness and sufficiency of the Contract Price.
- (iii) The Contractor acknowledges and hereby accepts the risk of inadequacy, mistake or error in or relating to any of the matters set forth in Clause 6.1 (i) above and hereby acknowledges and agrees that the Authority shall not be liable for the same in any manner whatsoever to the Contractor, or any person claiming through or under any of them, and shall not lead to any adjustment of Contract Price or Scheduled Completion Date.
- (iv) The Parties agree that any mistake or error in or relating to any of the matters set forth in Clause 6.1 (i) above shall not vitiate this Agreement, or render it voidable.
- (v) In the event that either Party becomes aware of any mistake or error relating to any of the matters set forth in Clause 6.1 (i) above, that Party shall immediately notify the other Party, specifying the mistake or error.
- (vi) Except as otherwise provided in this Agreement, all risks relating to the Project shall be borne by the Contractor; and the Authority shall not be liable in any manner for such risks or the consequences thereof.

Part III

Construction and Maintenance

Not to be used as a Bid Document, Only for Reference

Article 7

Performance Security

7.1 Performance Security

“The Contractor shall, for the performance of its obligations hereunder during the Construction Period, provide to the Authority, within 10 (ten) days of the date of this Agreement, an irrevocable and unconditional guarantee from a Bank in the form set forth in Schedule-G (the “Performance Security”) for an amount equal to **5% (Five percent)** of the Contract Price. The Performance Security shall be valid until 60 (sixty) days after the Defects Liability Period. The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects. If the Terms of the Performance Security specify its expiry date and the Contractor has not become entitled to receive the Performance Security by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the Performance Security until the Works have been completed and any defects have been remedied and Performance certificate issued as per clause 17.7. Until such time the Performance Security is provided by the Contractor pursuant hereto and the same comes into effect, the Bid Security shall remain in force and effect, and upon such provision of the Performance Security, the Authority shall release the Bid Security to the Contractor.”

7.2 Extension of Performance Security and Additional Performance Security - Deleted

7.3 Appropriation of Performance Security

- (i) Upon occurrence of a Contractor’s Default, the Authority shall, without prejudice to its other rights and remedies hereunder or in law, be entitled to encash and appropriate the relevant amounts from the Performance Security as Damages for such Contractor’s Default.
- (ii) Upon such encashment and appropriation from the Performance Security, the Contractor shall, within 30 (thirty) days thereof, replenish, in case of partial appropriation, to its original level the Performance Security, and in case of appropriation of the entire Performance Security provide a fresh Performance Security, as the case may be, and the Contractor shall, within the time so granted, replenish or furnish fresh Performance Security as aforesaid failing which the Authority shall be entitled to terminate the Agreement in accordance with Article 23.

Upon replenishment or furnishing of a fresh Performance Security, as the case may be, as aforesaid, the Contractor shall be entitled to an additional Cure Period of 30 (thirty) days for remedying the Contractor’s Default, and in the event of the Contractor not curing its default within such Cure Period, the Authority shall be entitled to encash and appropriate such Performance Security as Damages, and to terminate this Agreement in accordance with Article 23.

7.4 Release of Performance Security

“The Authority shall return the Performance Security to the Contractor within 60 (sixty) days of the later of the expiry of the maintenance period or the Defects Liability Period under this Agreement. Notwithstanding the aforesaid, the Parties agree that the Authority shall not be obliged to release the Performance Security until all Defects identified during the Defects Liability Period have been rectified.”

7.5 Retention Money

- (i) From every payment for Works due to the Contractor in accordance with the provisions of Clause 19.5, the Authority shall deduct 6% (six per cent) thereof as guarantee money for performance of the obligations of the Contractor during the Construction Period (the “Retention Money”) subject to the condition that the maximum amount of Retention Money shall not exceed 5% (five per cent) of the Contract Price.
- (ii) Upon occurrence of a Contractor’s Default, the Authority shall, without prejudice to its other rights and remedies hereunder or in law, be entitled to appropriate the relevant amounts from the Retention Money towards any losses, delays and cost of completing the Works and Maintenance, if any for such Contractor’s Default.
- (iii) Within 15 (fifteen) days of the date of issue of the Completion Certificate, the Authority shall refund the balance of Retention Money remaining with the Authority after adjusting the amounts appropriated under the provisions of Clause 7.5 (ii).
- (iv) The Parties agree that in the event of Termination of this Agreement, the Retention Money specified in this Clause 7.5 shall be treated as if they are Performance Security and shall be reckoned as such for the purposes of Termination Payment under Clause 23.6.
- (v) The Contractor may, upon furnishing an irrevocable and unconditional bank guarantee substantially in the form provided at Annex-II of Schedule-G, require the Authority to refund the Retention Money deducted by the Authority under the provisions of Clause 7.5(i) Provided that the refund hereunder shall be made in tranches of not less than 1% (one per cent) of the Contract Price.
- (vi) Within 15 (fifteen) days of the date of issue of the Completion Certificate, one half of the Retention Money (or Bank guarantee, which replaced Retention Money) shall be certified by the Authority’s Engineer for payment after adjusting amounts, if any, due to Authority (or release of Bank Guarantee) to the Contractor. The Contractor may substitute the remaining retention money with an on-demand bank guarantee in a form and from a source acceptable to the Authority.

Upon the expiration of the Defects Liability Period for the Works or final payment by the Authority pursuant to Clauses 17 and 19.15, whichever is earlier, the other half of the Retention Money (or Bank Guarantee which replaced Retention Money) shall be certified by the Authority’s Engineer for payment or release of bank Guarantee to the Contractor.

Article 8

Right of Way

8.1 The Site

The site of the Project Highway (the “**Site**”) shall comprise the site described in Schedule-A in respect of which the Right of Way shall be provided by the Authority to the Contractor. The Authority shall be responsible for:

- (a) acquiring and providing Right of Way on the Site in accordance with the alignment finalised by the Authority, free from all encroachments and encumbrances, and free access thereto for the execution of this Agreement; and
- (b) obtaining licenses and permits for environment clearance for the Project Highway.

8.2 Procurement of the Site

- (i) The Authority Representative, the Contractor and Authority’s Engineer shall, within 10 (ten) days of the date of this Agreement, inspect the Site and prepare a detailed memorandum containing an inventory of the Site including the vacant and unencumbered land, buildings, structures, road works, trees and any other immovable property on or attached to the Site (hereinafter referred to as the “**Handover Memorandum**”). Subject to the provisions of Clause 8.2 (iii), the Handover Memorandum shall have appended thereto an appendix (the “**Appendix**”) specifying in reasonable detail those parts of the Site to which vacant access and Right of Way has not been given to the Contractor along with details of hindrances in the Construction Zone. For sake of clarity the Handover Memorandum shall clearly specify the parts of Site where work can be executed. Signing of the Handover Memorandum, in three counterparts (each of which shall constitute an original), by the authorized representatives of the Authority, Contractor and Authority’s Engineer shall be deemed to constitute a valid evidence of giving the Right of Way to the Contractor for discharging its obligations under and in accordance with the provisions of this Agreement and for no other purpose whatsoever.
- (ii) Whenever the Authority is ready to hand over any part or parts of the Site included in the Appendix, it shall inform the Contractor, by notice, of the proposed date and time such of hand over. The Authority Representative and the Contractor shall, on the date so notified, inspect the specified parts of the Site, and prepare a memorandum containing an inventory of the vacant and unencumbered land, buildings, structures, road works, trees and any other immovable property on or attached to the Site so handed over. The signing of the memorandum, in three (3) counterparts (each of which shall constitute an original), by the authorised representatives of the Parties shall be deemed to constitute a valid evidence of giving the relevant Right of Way to the Contractor.

If the contractor fails to join for site inspection or disputes the parts of the site available for work, the Authority’s Engineer shall decide the parts of the site where work can be

executed and notify to both the parties within 3 days of the proposed date of inspection. The parties agree that such notification of the Authority's Engineer as mentioned hereinabove shall be final and binding on the parties.

- (iii) The Authority shall provide the Right of Way to the Contractor in respect of all land included in the Appendix by the date specified in Schedule-A for those parts of the Site referred to therein, and in the event of delay for any reason other than Force Majeure or breach of this Agreement by the Contractor, it shall pay to the Contractor, Damages in a sum calculated in accordance with Clause 8.3. The Contractor agrees that it shall not be entitled to claim any other damages on account of any such delay by the Authority.
- (iv) Notwithstanding anything to the contrary contained in this Clause 8.2, the Authority shall specify the parts of the Site, if any, for which Right of Way shall be provided to the Contractor on the dates specified in Schedule-A. Such parts shall also be included in the Appendix prepared in pursuance of Clause 8.2 (i).
- (v) The Authority further acknowledges and agrees that prior to the Appointed Date, it shall have procured issuance of the statutory notification under Applicable Laws for vesting of all the land comprising the Project in the Authority and has taken possession of area for Construction Zone for at least 80% (eighty per cent) of required area of Right of Way of the total length of the Project Highway. The Parties also acknowledge and agree that the conditions specified in this Clause 8.2 (iii) shall not be modified or waived by either Party.
- (vi) For the avoidance of doubt, the Parties expressly agree that the Appendix shall in no event contain sections of the Project Highway the cumulative length of which exceeds 20% (twenty percent) of required area of Right of Way of the total length of the Project Highway.
- (vii) Pursuant to signing of Handover Memorandum under clause 8.2 (i), Contractor shall submit to the Authority's Engineer, a monthly land possession report till expiry of 180 (one hundred and eighty) days from Appointed Date, in respect of those parts of the site to which vacant access and right of way was not given to the contractor and included in Appendix to the memorandum signed under clause 8.2 (i), duly specifying the part of the site, if any, for which the right of way is yet to be handed over.

8.3 Damages for delay in handing over the Site

- (i) In the event the Right of Way to any part of the Site is not provided by the Authority on or before the date(s) specified in Clause 8.2 for any reason other than Force Majeure or breach of this Agreement by the Contractor, the Authority shall pay Damages to the Contractor a sum calculated in accordance with the following formula for and in respect of those parts of the Site to which the Right of Way has not been provided:

Amount of Damages in Rs. Per day per meter = $0.05 \times C \times L/N$

Where,

C = the Contract Price;

L = length of the Project Highway (Elevated Road and At-grade Road) in meters; and

N = Completion period in days (Appointed Date to Scheduled Completion Date)

In the event that any Damages are due and payable to the Contractor under the provisions of this Clause 8.3 (i) for delay in providing the Right of Way, the Contractor shall, subject to the provisions of Clause 10.5, be entitled to Time Extension equal to the period for which the Damages have become due and payable under this Clause 8.3(i), save and except that:

- (a) if any delays involve time overlaps, the overlaps shall not be additive; and
- (b) such Time Extension shall be restricted only to the Works which are affected by the delay in providing the Right of Way.

For the avoidance of doubt, the Parties expressly agree that the Damages specified hereunder and the Time Extension specified in Clause 10.5 shall be restricted only to failure of the Authority to provide the Right of Way for and in respect of the "Construction Zone" which shall comprise the following components:

- Main carriageway
 - Median (for 4 lane carriageway or more)
 - Paved and earthen shoulders
 - Area for Structures including ROBs/RUBs.
 - Safety measures including Roadside Drains and Furniture.
 - A parallel working space for accommodating slopes/retaining structures etc.
- (ii) Notwithstanding anything to the contrary contained in this Agreement, the Contractor expressly agrees that Works on all parts of the Site for which Right of Way of Construction Zone is granted on the Appointed Date, or with respect to the parts of the Site provided in Schedule-A, no later than the date(s) specified therein, as the case may be, shall be completed before the Scheduled Completion Date and shall not qualify for any Time Extension under the provisions of Clause 8.3 (iii).
 - (iii) (a) Notwithstanding anything to the contrary contained in this Agreement, unless covered under the deemed de-scoping in terms of sub-clause 8.3 (iii) (b), the Authority may at any time withdraw any Works forming part of this Agreement, subject to such

Works not exceeding an aggregate value, such value to be determined in accordance with Schedule-H, equal to 10 (ten) percent of the Contract Price.

(b) Provided that if any Works cannot be undertaken within the municipal limits of a town or within any area falling in a reserved forest or wildlife sanctuary or the stretches where vacant access and Right of Way could not be handed over, as the case may be, because the requisite clearances or approvals or affected land parcels for commencing construction of Works therein have not been given within 180 (one hundred and eighty) days of the Appointed date, the affected Works shall be deemed to be withdrawn under the provisions of this Clause 8.3.3. Such Works shall not be computed for the purposes of the aforesaid ceiling of 10% (ten per cent) hereunder.

(c) Provided further that in case such stretches (as mentioned in Sub-Clause (b) above) can be handed over to the Contractor before the expiry of the original Scheduled Construction Period of the Project Highway, and the Contractor agrees to take up the work, the same may be allowed to be executed by him with corresponding Extension of Time, subject to the condition that the Contractor shall not be entitled to raise any claims on account of prolongation costs in this behalf.

(iv) Notwithstanding anything to the contrary contained in this Agreement, the Authority may at any time withdraw any Works forming part of this Agreement, subject to such Works not exceeding an aggregate value, such value to be determined in accordance with Schedule-H, equal to 10(ten)percent of the Contract Price.

Provided that if any Works cannot be undertaken within the municipal limits of a town or within any area falling in a reserved forest or wildlife sanctuary or railway crossing (due to delay in obtaining approval for GAD as required under clause 4.1.3(b)), as the case may be, because the requisite clearances or approvals for commencing construction of Works therein have not been given within 240(two hundred and forty) days of the Appointed Date, the affected Works shall be deemed to be withdrawn under the provisions of this Clause 8.3.(iv) unless the Parties agree to the contrary, and such Works shall not be computed for the purposes of the aforesaid ceiling of 10% (ten per cent) hereunder.

8.4 Site to be free from Encumbrances

Subject to the provisions of Clause 8.2, the Site shall be made available by the Authority to the Contractor pursuant hereto free from all Encumbrances and occupations and without the Contractor being required to make any payment to the Authority because of any costs, compensation, expenses and charges for the acquisition and use of such Site for the duration of the Project Completion Schedule. For the avoidance of doubt, it is agreed that the existing rights of way, easements, privileges, liberties and appurtenances to the Site shall not be deemed to be Encumbrances. It is further agreed that, unless otherwise specified in this Agreement, the Contractor accepts and undertakes to bear any and all risks arising out of the inadequacy or physical condition of the Site.

8.5 Protection of Site from encroachments

On and after signing the memorandum and/or subsequent memorandum referred to in Clause 8.2, and until the issue of the Completion Certificate, the Contractor shall maintain a round-the-clock vigil over the Site and shall ensure and procure that no encroachment takes place thereon. During the Construction Period, the Contractor shall protect the Site from any and all occupations, encroachments or Encumbrances, and shall not place or create nor permit any Sub-contractor or other person claiming through or under the Agreement to place or create any Encumbrance or security threat over all or any part of the Site or the Project Assets, or on any rights of the Contractor therein or under this Agreement, save and except as otherwise expressly set forth in this Agreement. In the event of any encroachment or occupation on any part of the Site, the Contractor shall report such encroachment or occupation forthwith to the Authority and undertake its removal at its own cost and expenses.

8.6 Special/ temporary Right of Way

The Contractor shall bear all costs and charges for any special or temporary right of way required by it in connection with access to the Site. The Contractor shall obtain at its cost such facilities on or outside the Site as may be required by it for the purposes of the Project Highway and the performance of its obligations under this Agreement.

8.7 Access to the Authority and the Authority's Engineer

- (i) The Right of Way given to the Contractor hereunder shall always be subject to the right of access of the Authority and the Authority's Engineer and their employees and agents for inspection, viewing and exercise of their rights and performance of their obligations under this Agreement.
- (ii) The Contractor shall ensure, subject to all relevant safety procedures, that the Authority has un-restricted access to the Site during any emergency situation, as decided by the Authority's Engineer.

8.8 Geological and Archaeological Finds - Deleted

Article 9

Utilities and Trees

9.1 Existing utilities and roads

Notwithstanding anything to the contrary contained herein, it shall be the responsibility of the Contractor to ensure that the respective entities owning the existing roads, right of way, level crossings, structures, or utilities on, under or above the Site are enabled by it to keep them in continuous satisfactory use, if necessary, by providing suitable temporary diversions with the authority of the controlling body of that road, right of way or utility.

9.2 Shifting of obstructing utilities

The Contractor shall, in accordance with Applicable Laws and with assistance of the Authority, undertake the work of shifting of any utility (including electric lines, water pipes, gas pipelines and telephone cables) to an appropriate location or alignment, if such utility or obstruction adversely affects the execution of Works or Maintenance of the Project Highway in accordance with this Agreement. The cost of such shifting, as per estimates prepared by the entity owning the utility and approved by the Authority, shall be reimbursed by the Authority to the Contractor. The scope of work of such shifting of Utilities shall be as indicated in Schedule-B-1. In the event of any delay of such shifting on the part of the contractor, no extension of time for completion of the project and no claims, in any manner, shall be admissible on this account against the Authority.

The work of shifting of Utilities can be taken up by the Contractor any time after signing of the Agreement.

9.3 New utilities

- (i) The Contractor shall allow, subject to the permission from the Authority and such conditions as the Authority may specify, access to, and use of the Site for laying telephone lines, water pipes, electricity lines/ cables or other public utilities. Where such access or use causes any financial loss to the Contractor, it may require the user of the Site to pay compensation or damages as per Applicable Laws. For the avoidance of doubt, it is agreed that use of the Site under this Clause 9.3 shall not in any manner relieve the Contractor of its obligation to construct and maintain the Project Highway in accordance with this Agreement and any damage caused by such use shall be restored forthwith at the cost of the Authority.
- (ii) The Authority may, by notice, require the Contractor to connect any adjoining road to the Project Highway, and the connecting portion thereof falling within the Site shall be constructed by the Contractor at the Authority's cost in accordance with Article 10.

- (iii) The Authority may by notice require the Contractor to connect, through a paved road, any adjoining service station, hotel, motel or any other public facility or amenity to the Project Highway, whereupon the connecting portion thereof that falls within the Site shall be constructed by the Contractor on payment of the cost. The cost to be paid by the Authority to the Contractor shall be determined by the Authority's Engineer. For the avoidance of doubt, in the event such road is to be constructed for the benefit of any entity, the Authority may require such entity to make an advance deposit with the Contractor or the Authority, as the case may be, of an amount equal to the estimated cost as determined by the Authority's Engineer and such advance shall be adjusted against the cost of construction as determined by the Authority's Engineer hereunder.
- (iv) In the event construction of any Works is affected by a new utility or works undertaken in accordance with this Clause 9.3, the Contractor shall be entitled to a reasonable Time Extension as determined by the Authority's Engineer.

9.4 Felling of trees

The Authority shall assist the Contractor in obtaining the Applicable Permits for felling of trees in non-forest area to be identified by the Authority for this purpose if, and only if, such trees cause a Material Adverse Effect on the construction or maintenance of the Project Highway. The Contractor shall fell these trees as per the Permits obtained. The cost of such felling shall be borne by the Authority and in the event of any delay in felling thereof for reasons beyond the control of the Contractor, it shall be excused for failure to perform any of its obligations hereunder if such failure is a direct consequence of delay in the felling of trees. The Parties hereto agree that the felled trees shall be deemed to be owned by the Authority and shall be disposed in such manner and subject to such conditions as the Authority may in its sole discretion deem appropriate. For the avoidance of doubt, the Parties agree that if any felling of trees hereunder is in a forest area, the Applicable Permit thereof shall be procured by the Authority within the time specified in the Agreement.

9.5 Dismantling of structures

The Contractor shall at its own cost dismantle the structures in the acquired lands including those on patta lands, abadi lands, assigned lands, etc. the compensation for which, was paid by the Authority to the land owners and the lands were handed over to the Contractor as per Schedule B-I. The Contractor shall, at its own cost, dispose of the dismantled material in its sole discretion as deemed appropriate, while complying with all environmental guidelines and regulations and clear the Site for undertaking construction. In the event of any delay in dismantling of structures thereof for reasons beyond the control of the Contractor, the Contractor shall be entitled to Damages in a sum calculated in accordance with the formula specified in Clause 8.3 (i) for the period of delay, and to the Time Extension in accordance with Clause 10.5 for and in respect of the part(s) of the Works affected by such delay; provided that if the delays involve any time overlaps, the overlaps shall not be additive.

9.6 Development Period- Deleted

Article 10

Design and Construction of the Project Highway

10.1 Obligations prior to commencement of Works

- (i) Within 20 (twenty) days of the Appointed Date, the Contractor shall:
- (a) Appoint its representative, duly authorised to deal with the Authority in respect of all matters under or arising out of or relating to this Agreement;
 - (b) Appoint a design director (the “**Design Director**”) who will head the Contractor’s design unit and shall be responsible for surveys, investigations, collection of data, and preparation of preliminary and detailed designs;
 - (c) undertake and perform all such acts, deeds and things as may be necessary or required before commencement of Works under and in accordance with this Agreement, the Applicable Laws and Applicable Permits; and
 - (d) Make its own arrangements for quarrying of materials needed for the Project Highway under and in accordance with the Applicable Laws and Applicable Permits.
- (ii) The Authority shall, appoint an engineer (the “**Authority’s Engineer**”) before the Appointed Date to discharge the functions and duties specified in this Agreement, and shall notify to the Contractor the name, address and the date of appointment of the Authority’s Engineer forthwith.
- (iii) Within 30 (thirty) days of the Appointed Date, the Contractor shall submit to the Authority and the Authority’s Engineer a programme (the “**Programme**”) for the Works, developed using networking techniques, for review and consent of the Engineer, giving the following details:
- (a) Part I : Contractor’s organisation for the Project, the general methods and arrangements for design and construction, environmental management plan, Quality Assurance Plan including design quality plan, traffic management and safety plan covering safety of users and workers during construction (including use of ‘ROBOTS’ for diversion and control of traffic), Contractor’s key personnel and equipment.
 - (b) Part II : Programme for completion of all stages of construction given in Schedule-H and Project Milestones of the Works as specified in Project Completion Schedule set forth in Schedule-J. The Programme shall include:

- i. the order in which the Contractor intends to carry out the Works, including the anticipated timing of design and stages of Works;
- ii. the periods for reviews under Clause 10.2;
- iii. the sequence and timing of inspections and tests specified in this Agreement; and
- iv. the particulars for the pre-construction reviews and for any other submissions, approvals and consents specified in the Agreement.

The Contractor shall submit a revised Programme whenever the previous Programme is inconsistent with the actual progress or with the Contractor's obligations.

(c) Part III : Monthly cash flow forecast.

- (iv) The Contractor shall compute, on the basis of the Drawings prepared in accordance with Clause 10.2 (iv), and provide to the Authority's Engineer, the length, area and numbers, as the case may be, in respect of the various items of work specified in Schedule-H and comprising the Scope of the Project. The Parties expressly agree that these details shall form the basis for estimating the interim payments for the Works in accordance with the provisions of Clause 19.3. For the avoidance of doubt, the sum of payments to be computed in respect of all the items of work shall not exceed the Contract Price, as may be adjusted in accordance with the provisions of this Agreement.
- (v) The Contractor shall appoint a safety consultant (the "**Safety Consultant**") to carry out a safety audit at the design stage of the Project Highway in accordance with the Applicable Laws and Good Industry Practice. The Safety Consultant shall be appointed after proposing to the Authority a panel of three (3) names of qualified and experienced firms from which the Authority may choose one (1) to be the Safety Consultant. Provided, however, that if the panel is not acceptable to the Authority and the reasons for the same are furnished to the Contractor, the Contractor shall propose to the Authority a revised panel of three (3) names from the firms empaneled as safety consultants by the [Ministry of Road Transport and Highways] for obtaining the consent of the Authority. The Contractor shall also obtain the consent of the Authority for the key personnel of the Safety Consultant who shall have adequate experience and qualifications in safety audit of the highway projects. The Authority shall, within 15 (fifteen) days of receiving a proposal from the Contractor hereunder, convey its decision, with reasons, to the Contractor, and if no such decision is conveyed within the said period, the Contractor may proceed with engaging of the Safety Consultant.
- (vi) The safety audit pursuant to Clause 10.1 (v) shall be carried out by the Safety Consultant in respect of all such design details that have a bearing on safety of Users as well as pedestrians and animals involved in or associated with accidents. The

recommendations of the Safety Consultant shall be incorporated in the design of the Project Highway and the Contractor shall forward to the Authority's Engineer a certificate to this effect together with the recommendations of the Safety Consultant. In the event that any works required by the Safety Consultant shall fall beyond the scope of Schedule-B, Schedule-C or Schedule-D, the Contractor shall make a report thereon and seek the instructions of the Authority for Change in Scope. For the avoidance of doubt, the Safety Consultant to be engaged by the Contractor shall be independent of the design and implementation team of the Contractor.

10.2 Design and Drawings

- (i) Design and Drawings shall be developed in conformity with the Specifications and Standards set forth in Schedule-D. In the event, the Contractor requires any relaxation in design standards due to restricted Right of Way in any section, the alternative design criteria for such section shall be provided for review and approval of the Authority's Engineer.
- (ii) The Contractor shall appoint a proof check consultant (the "**Proof Consultant**") after proposing to the Authority a panel of three (3) names of qualified and experienced firms from whom the Authority may choose one (1) to be the Proof Consultant. Provided, however, that if the panel is not acceptable to the Authority and the reasons for the same are furnished to the Contractor, the Contractor shall propose to the Authority a revised panel of three (3) names from the firms empaneled as proof consultants by the [Ministry of Road Transport and Highways] for obtaining the consent of the Authority. The Contractor shall also obtain the consent of the Authority for two (2) key personnel of the Proof Consultant who shall have adequate experience and qualifications in highways and bridges respectively. The Authority shall, within 15 (fifteen) days of receiving a proposal from the Contractor hereunder, convey its decision, with reasons, to the Contractor, and if no such decision is conveyed within the said period, the Contractor may proceed with engaging of the Proof Consultant.
- (iii) The Proof Consultant shall:
 - (a) evolve a systems approach with the Design Director so as to minimize the time required for final designs and construction drawings; and
 - (b) proof check the detailed calculations, drawings and designs, which have been approved by the Design Director.
- (iv) In respect of the Contractor's obligations with respect to the design and Drawings of the Project Highway as set forth in Schedule-I, the following shall apply:
 - (a) The Contractor shall prepare and submit, with reasonable promptness and in such sequence as is consistent with the Project Completion Schedule, three

(3) copies each of the design and Drawings, duly certified by the Proof Consultant, to the Authority's Engineer for its approval. Provided, however, that in respect of Major Bridges and Structures, the Authority's Engineer may require additional drawings for approval in accordance with Good Industry Practice.

- (b) By submitting the Drawings for review and approval to the Authority's Engineer, the Contractor shall be deemed to have represented that it has determined and verified that the design and engineering, including field construction criteria related thereto, are in conformity with the Scope of the Project, the Specifications and Standards and the Applicable Laws;
- (c) Within 15 (fifteen) days of the receipt of the Drawings, the Authority's Engineer shall review the same and convey its approval/observations to the Contractor with particular reference to their conformity or otherwise with the Scope of the Project and the Specifications and Standards. Provided, however that in case of a major bridge or structure, the aforesaid period of 15 (fifteen) days may be extended up to 30 (thirty) days;
- (d) If the aforesaid observations of the Authority's Engineer indicate that the Drawings are not in conformity with the Scope of the Project or the Specifications and Standards, such Drawings shall be revised by the Contractor in conformity with the provisions of this Agreement and resubmitted to the Authority's Engineer for review and approval. The Authority's Engineer shall give its observations, if any, within 10 (ten) days of receipt of the revised Drawings. In the event the Contractor fails to revise and resubmit such Drawings to the Authority's Engineer for review/approval as aforesaid, the Authority's Engineer may withhold the payment for the affected works in accordance with the provisions of Clause 19.5 (iv). If the Contractor disputes any decision, direction or determination of the Authority's Engineer hereunder, the Dispute shall be resolved in accordance with the Dispute Resolution Procedure;
- (e) No review approval and/or observation of the Authority's Engineer and/or its failure to review/approval and/or convey its observations on any Drawings shall relieve the Contractor of its obligations and liabilities under this Agreement in any manner nor shall the Authority's Engineer or the Authority be liable for the same in any manner; and if errors, omissions, ambiguities, inconsistencies, inadequacies or other Defects are found in the Drawings, they and the construction works shall be corrected at the Contractor's cost, notwithstanding any approval under this Article 10;
- (f) The Contractor shall be responsible for delays in submitting the Drawing as set forth in Schedule-I caused by reason of delays in surveys and field

investigations, and shall not be entitled to seek any relief in that regard from the Authority; and

- (g) The Contractor warrants that its designers, including any third parties engaged by it, shall have the required experience and capability in accordance with Good Industry Practice and it shall indemnify the Authority against any damage, expense, liability, loss or claim, which the Authority might incur, sustain or be subject to arising from any breach of the Contractor's design responsibility and/or warranty set out in this Clause.
- (h) The Contractor shall ensure that all the designs and drawings shall be approved from the Authority's Engineer within 90 days (ninety) from the Appointed Date.
- (v) Any cost or delay in construction arising from review/approval by the Authority's Engineer shall be borne by the Contractor.
- (vi) Works shall be executed in accordance with the Drawings provided by the Contractor in accordance with the provisions of this Clause 10.2 and the approval of the Authority's Engineer thereon as communicated pursuant to the provisions of sub-Clause (c) & (d) of Clause 10.2 (iv). Such Drawings shall not be amended or altered without prior written notice to the Authority's Engineer. If a Party becomes aware of an error or defect of a technical nature in the design or Drawings, that Party shall promptly give notice to the other Party of such error or defect.
- (vii) Within 90 (ninety) days of the Project Completion Date, the Contractor shall furnish to the Authority and the Authority's Engineer a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities.

10.3 Construction of the Project Highway

- (i) The Contractor shall construct the Project Highway as specified in Schedule- B and Schedule-C and in conformity with the Specifications and Standards set forth in Schedule-D. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works. The [1275th One Thousand Two Hundred and Seventy Five day] from the Appointed Date shall be the scheduled completion date (the "Scheduled Completion Date") and the Contractor agrees and undertakes that the construction shall be completed on or before the Scheduled Completion Date, including any extension thereof.

- (ii) The Contractor shall construct the Project Highway in accordance with the Project Completion Schedule set forth in Schedule-J. In the event that the Contractor fails to achieve any Project Milestone or the Scheduled Completion Date within a period of 30 (thirty) days from the date set forth in Schedule-J, unless such failure has occurred due to Force Majeure or for reasons solely attributable to the Authority, it shall pay Damages to the Authority of a sum calculated at the rate of 0.05% (zero point zero five percent) of the Contract Price for delay of each day reckoned from the date specified in Schedule –J and until such Project Milestone is achieved or the Project Highway is completed; provided that if the period for any or all Project Milestones or the Scheduled Completion Date is extended in accordance with the provisions of this Agreement, the dates set forth in Schedule-J shall be deemed to be modified accordingly and the provisions of this Agreement shall apply as if Schedule-J has been amended as above; provided further that in the event the Project Highway is completed within or before the Scheduled Completion Date including any Time Extension, applicable for that work or section, the Damages paid under this Clause 10.3(ii) shall be refunded by the Authority to the Contractor, but without any interest thereon. The Parties agree that for determining achievement or delays in completion of the Project Milestones or the Project on the due date, the works affected due to delay in providing the site for which time extension has been granted beyond the Scheduled Completion Date will be excluded. For example on the due date to achieve the Project Milestone-I (i.e., Stage Payments of 10% (ten percent) of Contract Price on 180th (one hundred and eighty) day from the Appointed Date), if 5% (five percent) of the project length corresponding to the Project Milestone-I is not handed over or lately handed over resulting in the extension of completion of this 5% (five percent) length beyond Scheduled Completion Date, Stage Payment of 10% X 0.95 = 9.5% only is to be achieved by 180th (one hundred and eighty) day.

For the avoidance of doubt, it is agreed that recovery of Damages under this Clause 10.3 (ii) shall be without prejudice to the rights of the Authority under this Agreement including the right of Termination thereof. The Parties further agree that Time Extension hereunder shall only be reckoned for and in respect of the affected Works as specified in Clause 10.5 (ii).

- (iii) The Authority shall notify the Contractor of its decision to impose Damages in pursuance with the provisions of this Clause 10.3. Provided that no deduction on account of Damages shall be affected by the Authority without notifying the Contractor of its decision to impose the Damages, and taking into consideration the representation, if any, made by the Contractor within 20 (twenty) days of such notice. The Parties expressly agree that the total amount of Damages under Clause 10.3 (ii) shall not exceed 10% (ten percent) of the Contract Price. If the damages exceed 10% (ten percent) of the Contract Price, the Contractor shall be deemed to be in default of this agreement having no cure and the Authority shall be entitled to

terminate this Agreement by issuing a Termination Notice in accordance with the provisions of Clause 23.1 (ii).

- (iv) In the event that the Contractor fails to achieve the Project Completion within a period of 90 (ninety) days from the Schedule Completion Date set forth in Schedule-J, unless such failure has occurred due to Force Majeure or for reasons solely attributable to the Authority, the contractor shall be deemed to be ineligible for bidding any future projects of the Authority, both as the sole party or as one of the parties of Joint Venture/ Consortium during the period from Scheduled Completion Date to issuance of Completion Certificate. This restriction is applicable if the contract value of the delayed project is not less than Rs. 300 Crore.

10.4 Maintenance during Construction Period

- (i) During the Construction Period, the Contractor shall maintain, at its cost, the existing lane(s) of the Project Highway so that the traffic worthiness and safety thereof are at no time materially inferior as compared to their condition on Appointed Date, and shall undertake the necessary repair and maintenance works for this purpose; provided that the Contractor may, at its cost, interrupt and divert the flow of traffic if such interruption and diversion is necessary for the efficient progress of Works and conforms to Good Industry Practice, provided further that such interruption and diversion shall be undertaken by the Contractor only with the prior written approval of the Authority's Engineer which approval shall not be unreasonably withheld. For the avoidance of doubt, it is agreed that the Contractor shall at all times be responsible for ensuring safe operation of the Project Highway. It is further agreed that in the event the Project includes construction of a bypass or tunnel and realignment of the existing carriageway, the Contractor shall maintain the existing highway in such sections until the new Works are open to traffic.
- (ii) Notwithstanding anything to the contrary contained in this Agreement, in the event of default by the Contractor in discharging the obligations specified in Clause 10.4 (i) above, the Authority shall get these maintenance works completed in the manner recommended by the Authority's Engineer to avoid public inconvenience at the risk and cost of the Contractor in order to keep the road in traffic worthy condition.

10.5 Extension of time for completion

- (i) Without prejudice to any other provision of this Agreement for and in respect of extension of time, the Contractor shall be entitled to extension of time in the Project Completion Schedule (the "**Time Extension**") to the extent that completion of any Project Milestone is or will be delayed by any of the following, namely:
 - (a) delay in providing the Right of Way of Construction Zone, environmental clearances or approval of railway authorities, specified in Clause 3.1 (iv);

- (b) Change of Scope (unless an adjustment to the Scheduled Completion Date has been agreed under Article 13);
 - (c) occurrence of a Force Majeure Event;
 - (d) any delay, impediment or prevention caused by or attributable to the Authority, the Authority 's personnel including the Authority's Engineer and staff or the Authority's other contractors on the Site; and
 - (e) any other cause or delay which entitles the Contractor to Time Extension in accordance with the provisions of this Agreement.
- (ii) The Contractor shall, no later than 15 (fifteen) business days from the occurrence of an event or circumstance specified in Clause 10.5 (i), inform the Authority's Engineer by notice in writing, with a copy to the Authority, stating in reasonable detail with supporting particulars, the event or circumstances giving rise to the claim for Time Extension in accordance with the provisions of this Agreement. Provided that the period of 15 (fifteen) business days shall be calculated from the date on which the Contractor became aware, or should have become aware, of the occurrence of such an event or circumstance.

Provided further that notwithstanding anything to the contrary contained in this Agreement, Time Extension shall be due and applicable only for the Works which are affected by the aforesaid events or circumstances and shall not in any manner affect the Project Completion Schedule for and in respect of the Works which are not affected hereunder.

- (iii) On the failure of the Contractor to issue to the Authority's Engineer a notice in accordance with the provisions of Clause 10.5 (ii) within the time specified therein, the Contractor shall not be entitled to any Time Extension and shall forfeit its right for any such claims in future. For the avoidance of doubt, in the event of failure of the Contractor to issue notice as specified in this clause 10.5 (iii), the Authority shall be discharged from all liability in connection with the claim.
- (iv) The Authority's Engineer shall, on receipt of the claim in accordance with the provisions of Clause 10.5 (i), examine the claim expeditiously within the time frame specified herein. In the event the Authority's Engineer requires any clarifications to examine the claim, the Authority's Engineer shall seek the same within 15 (fifteen) days from the date of receiving the claim. The Contractor shall, on receipt of the communication of the Authority's Engineer requesting for clarification, furnish the same to the Authority's Engineer within 10 (ten) days thereof. The Authority's Engineer shall, within a period of 30 (thirty) days from the date of receipt of such clarifications, forward in writing to the Contractor its determination of Time Extension.

Provided that when determining each extension of time under this Clause 10.5, the Authority's Engineer shall review previous determinations and may increase, but shall not decrease, the total Time Extension.

- (v) If the event or circumstance giving rise to the notice has a continuing effect:
- (a) a fully detailed claim shall be considered as interim;
 - (b) the Contractor shall, no later than 10 (ten) days after the close of each month, send further interim claims specifying the accumulated delay, the extension of time claimed, and such further particulars as the Authority's Engineer may reasonably require; and
 - (c) the Contractor shall send a final claim within 30 (thirty) days after the effect of the event or the circumstance ceases.

Upon receipt of the claim hereunder, the Authority's Engineer shall examine the same in accordance with the provisions of Clause 10.5 (iv) within a period of 30 (thirty) days of the receipt thereof

10.6 Incomplete Works

In the event the Contractor fails to complete the Works in accordance with the Project Completion Schedule, including any Time Extension granted under this Agreement, the Contractor shall endeavor to complete the balance work expeditiously and shall pay Damages to the Authority in accordance with the provisions of Clause 10.3 (ii) for delay of each day until the Works are completed in accordance with the provisions of this Agreement. Recovery of Damages under this Clause shall be without prejudice to the rights of the Authority under this Agreement including the right to termination under Clause 23.1.

10.7 Maintenance Manual

No later than 60 (sixty) days prior to the Project Completion Date, the Contractor shall, in consultation with the Authority's Engineer, evolve a maintenance manual (the "**Maintenance Manual**") for the regular and preventive maintenance of the Project Highway in conformity with the Specifications and Standards, safety requirements and Good Industry Practice, and shall provide 5 (five) copies thereof to the Authority's Engineer. The Authority's Engineer shall review the Maintenance Manual within 15 (fifteen) days of its receipt and communicate its comments to the Contractor for necessary modifications, if any.

10.8 As-Built Records

The Contractor shall prepare, and keep up-to-date, a complete set of as built records of the execution of the Works, showing the exact as built locations, sizes and details on the Works as executed with cross references to all relevant specifications and datasheets. These records shall be kept on the Site and shall be used exclusively for

the purpose of this Sub-Clause 10.8. The Contractor shall provide 2 (two) copies of as built records to the Authority prior to the commencement of the Tests on Completion.

10.9 Contractor's Use of Authority's Documents

Intellectual property in the Authority's requirements and Specifications and Standards and all other documents and materials issued by the Authority or the Authority's Representative to the Contractor shall (as between the parties) remain the property of the Authority. The Contractor may, at its cost, copy, use and communicate any such documents for the purposes of the Contract. They shall not, without the consent of the Authority, be used, copied or communicated to a third party by the Contractor, except as necessary for the purposes of the Works under the Agreement.

Not to be used as a Bid Document, Only for Reference

Article 11

Quality Assurance, Monitoring and Supervision

11.1 Quality of Materials and workmanship

The Contractor shall ensure that the Construction, Materials and workmanship are in accordance with the requirements specified in this Agreement, Specifications and Standards and Good Industry Practice.

11.2 Quality control system

- (i) The Contractor shall establish a quality control mechanism to ensure compliance with the provisions of this Agreement (the “**Quality Assurance Plan**” or “**QAP**”).
- (ii) The Contractor shall, within 30 (thirty) days of the Appointed Date, submit to the Authority’s Engineer its Quality Assurance Plan which shall include the following:
 - (a) organisation, duties and responsibilities, procedures, inspections and documentation;
 - (b) quality control mechanism including sampling and testing of Materials, test frequencies, standards, acceptance criteria, testing facilities, reporting, recording and interpretation of test results, approvals, check list for site activities, and proforma for testing and calibration in accordance with the Specifications for Road and Bridge Works issued by MORTH, relevant IRC specifications and Good Industry Practice and
 - (c) internal quality audit system.

The Authority’s Engineer shall convey its approval to the Contractor within a period of 21 (twenty-one) days of receipt of the QAP stating the modifications, if any, required, and the Contractor shall incorporate those in the QAP to the extent required for conforming with the provisions of this Clause 11.2.

- (iii) The Contractor shall procure all documents, apparatus and instruments, fuel, consumables, water, electricity, labor, Materials, samples, and qualified personnel as are necessary for examining and testing the Project Assets and workmanship in accordance with the Quality Assurance Plan.
- (iv) The cost of testing of Construction, Materials and workmanship under this Article 11 shall be borne by the Contractor.

11.3 Methodology

The Contractor shall, at least 15 (fifteen) days prior to the commencement of the construction, submit to the Authority’s Engineer for review and consent the

methodology proposed to be adopted for executing the Works, giving details of equipment to be deployed, traffic management and measures for ensuring safety. The Authority's Engineer shall complete the review and convey its consent to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

11.4 Inspection and technical audit by the Authority

The Authority or any representative authorised by the Authority in this behalf may inspect and review the progress and quality of the construction of Project Highway and issue appropriate directions to the Authority's Engineer and the Contractor for taking remedial action in the event the Works are not in accordance with the provisions of this Agreement.

11.5 External technical audit

- (i) At any time during construction, the Authority may appoint an external technical auditor to conduct an audit of the quality of the Works. The Auditor in the presence of the representatives of the Contractor and the Authority's Engineer shall carry out the tests and/ or collect samples for testing in the laboratory. The timing, the testing equipment and the sample size of this audit shall be as decided by the Authority. The findings of the audit, to the extent accepted by the Authority, shall be notified to the Contractor and the Authority's Engineer for taking remedial action in accordance with this Agreement.
- (ii) After completion of the remedial measures by the Contractor, the Auditor shall undertake a closure audit and this process will continue till the remedial measures have brought the works into compliance with the Specifications and Standards. The Contractor shall provide all assistance as may be required by the auditor in the conduct of its audit hereunder. Notwithstanding anything contained in this Clause 11.5, the external technical audit shall not affect any obligations of the Contractor or the Authority's Engineer under this Agreement.

11.6 Inspection of construction records

The Authority shall have the right to inspect the records of the Contractor relating to the Works.

11.7 Monthly progress reports

During the Construction Period, the Contractor shall, no later than 10 (ten) days after the close of each month, furnish to the Authority and the Authority's Engineer a monthly report on progress of the Works and shall promptly give such other relevant information as may be required by the Authority's Engineer.

The Contractor agrees that reporting under this Clause 11.7 shall continue until the date of the completion of the Works. Each report shall include:

- (a) an executive summary;
- (b) charts showing the status of Contractor's documents, construction and manufacturing and environmental works;
- (c) details of work subcontracted and the performance of Sub-contractors;
- (d) for the construction of each main part of the Works, the extent of progress(both quantity and percentage of the whole), the actual or expected dates of commencement, anticipated completion date of the activity, Contractor's inspections and tests;
- (e) records of manpower and Contractor's equipment on the Site;
- (f) copies for that month of quality assurance documents, test results and certificates;
- (g) safety statistics, accident data collection including details of any hazardous incidents and activities relating to environmental aspects and public relations;
- (h) comparisons of actual and planned progress, with details of any aspects which may jeopardize the completion in accordance with the Agreement, and the measures being (or to be) adopted to overcome such aspects;
- (i) details of any unresolved disputes or claims, in relation to the Project;
- (j) details of any revision to the cash flow estimate, together with a copy of the revised cash flow estimate;
- (k) status of various Applicable Permits and compliance of conditions therein;
- (l) details of various royalty payment and insurances required to be taken by the Contractor; and
- (m) such other reports as may be required by the Authority for enabling the Authority to comply with its obligations under the other Project contracts.
- (n) details of defects by the Authority;
- (o) change in emission of any sewage or effluent of any nature whatsoever, whether qualitatively or quantitatively;
- (p) any Material Adverse Effect;
- (q) declaration towards compliance with Applicable Laws including but not limited to environmental and labour legislations;
- (r) declaration specifying compliance with all Manuals provided to the Contractor; and

- (s) any change in the flow of traffic in the existing Project Highway.

11.8 Inspection

- (i) The Authority's Engineer and its authorized representative shall at all reasonable times:
 - (a) have full access to all parts of the Site and to all places from which natural Materials are being obtained for use in the Works; and
 - (b) during production, manufacture and construction at the Site and at the place of production, be entitled to examine, inspect, measure and test the Materials and workmanship, and to check the progress of manufacture of Materials.
- (ii) The Contractor shall give the Authority's Engineer and its authorized agents access, facilities and safety equipment for carrying out their obligations under this Agreement.
- (iii) The Authority's Engineer shall submit a monthly inspection report (the "**Inspection Report**") to the Authority and the Contractor bringing out the results of inspections and the remedial action taken by the Contractor in respect of defects or deficiencies. For the avoidance of doubt, such inspection or submission of Inspection Report by the Authority's Engineer shall not relieve or absolve the Contractor of its obligations and liabilities under this Agreement in any manner whatsoever.

11.9 Samples

The Contractor shall submit the following samples of Materials and relevant information to the Authority's Engineer for pre-construction review:

- (a) manufacturer's test reports and standard samples of manufactured Materials; and
- (b) samples of such other Materials as the Authority's Engineer may require.

11.10 Tests

- (i) For determining that the Works conform to the Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out or cause to be carried out tests, at such time and frequency and in such manner as specified in this Agreement, and in accordance with Good Industry Practice for quality assurance. The test checks by the Authority's Engineer shall comprise at least 60% (Sixty percent) of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

- (ii) In the event that results of any tests conducted under this Clause 11.10 establish any Defects or deficiencies in the Works, the Contractor shall carry out remedial measures and furnish a report to the Authority's Engineer in this behalf. The Authority's Engineer shall require the Contractor to carry out or cause to be carried out tests to determine that such remedial measures have brought the Works into compliance with the Specifications and Standards, and the procedure shall be repeated until such Works conform to the Specifications and Standards. For the avoidance of doubt, the cost of such tests and remedial measures in pursuance thereof shall be solely borne by the Contractor.

11.11 Examination of work before covering up

In respect of the work which the Authority's Engineer is entitled to examine, inspect, measure and/or test before it is covered up or put out of view or any part of the work is placed thereon, the Contractor shall give notice to the Authority's Engineer whenever any such work is ready and before it is covered up. The Authority's Engineer shall then either carry out the examination, inspection or testing without unreasonable delay, or promptly give notice to the Contractor that the Authority's Engineer does not require to do so. Provided, however, that if any work is of a continuous nature where it is not possible or prudent to keep it uncovered or incomplete, the Contractor shall notify the schedule of carrying out such work to give sufficient opportunity, not being less than 3 (three) business days' notice, to the Authority's Engineer to conduct its inspection, measurement or test while the work is continuing. Provided further that in the event the Contractor receives no response from the Authority's Engineer within a period of 3 (three) business days from the date on which the Contractor's notice hereunder is delivered to the Authority's Engineer, the Contractor shall be entitled to assume that the Authority's Engineer would not undertake the said inspection.

11.12 Rejection

If, as a result of an examination, inspection, measurement or testing, any Plant, Materials, design or workmanship is found to be defective or otherwise not in accordance with the provisions of this Agreement, the Authority's Engineer shall reject the Plant, Materials, design or workmanship by giving notice to the Contractor with reasons. The Contractor shall then promptly make good the Defect and ensure that the rejected item complies with the requirements of this Agreement.

If the Authority's Engineer requires the Plant, Materials, design or workmanship to be retested, the tests shall be repeated under the same terms and conditions, as applicable in each case. If the rejection and retesting cause the Authority to incur any additional costs, such cost shall be recoverable by the Authority from the Contractor; and may be deducted by the Authority from any monies due to be paid to the Contractor.

11.13 Remedial work

- (i) Notwithstanding any previous test or certification, the Authority's Engineer may instruct the Contractor to:
 - (a) remove from the Site and replace any Plant or Materials which are not in accordance with the provisions of this Agreement;
 - (b) remove and re-execute any work which is not in accordance with the provisions of this Agreement and the Specification and Standards; and
 - (c) execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.
- (ii) If the Contractor fails to comply with the instructions issued by the Authority's Engineer under Clause 11.13 (i), within the time specified in the Authority's Engineer's notice or as mutually agreed, the Authority's Engineer may advise the Authority to have the work executed by another agency. The cost so incurred by the Authority for undertaking such work shall, without prejudice to the rights of the Authority to recover Damages in accordance with the provisions of this Agreement, be recoverable from the Contractor and may be deducted by the Authority from any monies due to be paid to the Contractor.

11.14 Delays during construction

Without prejudice to the provisions of Clause 10.3 (ii), in the event the Contractor does not achieve any of the Project Milestones or the Authority's Engineer shall have reasonably determined that the rate of progress of Works is such that Completion of the Project Highway is not likely to be achieved by the end of the Scheduled Completion Date, it shall notify the same to the Contractor, and the Contractor shall, within 15 (fifteen) days of such notice, by a communication inform the Authority's Engineer in reasonable detail about the steps it proposes to take to expedite progress and the period within which it shall achieve the Project Completion Date.

11.15 Quality control records and Documents

The Contractor shall hand over a copy of all its quality control records and documents to the Authority's Engineer before the Completion Certificate is issued pursuant to Clause 12.2. The Contractor shall submit Road Signage Plans to the Authority Engineer for approval at least 6 (six) months prior to expected completion of Project Highway.

11.16 Video recording by Drone

During the Construction Period, the Contractor shall provide to the Authority for every calendar quarter, a video recording, which will be compiled into a 30 minutes compact disc or digital video disc, as the case may be, covering the status and progress of Works in that quarter. The video recording shall be provided to the Authority no later than 15 (fifteen) days after the close of each quarter after the Appointed Date.

11.17 Suspension of unsafe Construction Works

- (i) Upon recommendation of the Authority's Engineer to this effect, the Authority may by notice require the Contractor to suspend forthwith the whole or any part of the Works if, in the reasonable opinion of the Authority's Engineer, such work threatens the safety of the Users and pedestrians.
- (ii) The Contractor shall, pursuant to the notice under Clause 11.17 (i), suspend the Works or any part thereof for such time and in such manner as may be specified by the Authority and thereupon carry out remedial measures to secure the safety of suspended works, the Users and pedestrians. The Contractor may by notice require the Authority's Engineer to inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked. Upon receiving the recommendations of the Authority's Engineer, the Authority shall either revoke such suspension or instruct the Contractor to carry out such other and further remedial measures as may be necessary in the reasonable opinion of the Authority, and the procedure set forth in this Clause 11.17 shall be repeated until the suspension hereunder is revoked.
- (iii) Subject to the provisions of Clause 21.6, all reasonable costs incurred for maintaining and protecting the Works or part thereof during the period of suspension (the "**Preservation Costs**"), shall be borne by the Contractor; provided that if the suspension has occurred as a result of any breach of this Agreement by the Authority, the Preservation Costs shall be borne by the Authority.
- (iv) If suspension of Works is for reasons not attributable to the Contractor, the Authority's Engineer shall determine any Time Extension to which the Contractor is reasonably entitled.

11.18 Staff and Labour

- (i) Engagement of Staff and Labour
 - (a) The Contractor shall make its own arrangements for the engagement of all personnel and labour, local or otherwise, and for their payment, housing, feeding and transport.

- (b) The Contractor has verified/ shall verify the identity and address of all its employees and officials related to the Works by collecting necessary documentary proof.
 - (c) The Contractor shall seek a self-declaration from its employees that they have not been convicted of any criminal offence by any court and if any criminal proceedings/charge-sheets have been pending/filed against them. The Contractor shall not employ persons with criminal track record on the project. In cases where it comes to notice later that the employee concerned has concealed any such fact in his self-declaration or commits a criminal offence during the course of his employment, the Contractor shall remove such person from the project
 - (d) Deleted.
 - (e) The employees and personnel of the Contractor shall work under the supervision, control and direction of the Contractor and the Contractor shall be solely responsible for all negotiations with its employees and personnel relating to their salaries and benefits, and shall be responsible for assessments and monitoring of performance and for all disciplinary matters. All employees / personnel, executives engaged by the Contractor shall be in sole employment of the Contractor and the Contractor shall be solely responsible for their salaries, wages, statutory payments, etc and under no circumstances the personnel shall be deemed to be the employees of the Authority. Under no circumstances the Authority shall be liable for any payment or claim or compensation of any nature to the employees and personnel of the Contractor.
- (ii) Returns of Labour
- (a) The Contractor shall deliver to the Authority a detailed return in such form and at such intervals as the Authority may prescribe, showing the details including names, payment details and terms of appointment of the several classes of labour employed by the Contractor from time to time for the Works. The Contractor shall, in its returns certify that all dues of the workers or labour have been fully paid.
 - (b) The Authority is entitled to witness labour payments made or to be made by the Contractor. If the Contractor defaults in its obligations for making any payments under the labour laws, the Employer may make the relevant payments. Any sum equal to any amount paid by the Employer under this Sub-Sub-Clause 9.2 shall be immediately due as a debt from the Contractor to the Employer and until payment/ set off shall carry interest at 18% per annum. For this purpose it is agreed between the parties that debt due aforesaid shall be set off immediately out the running account bills of the Contractor under this Agreement.

(iii) Persons in the Service of Others

The Contractor shall not recruit, or attempt to recruit from amongst persons in the service of the Authority.

(iv) Labour Laws

- (a) The Contractor shall obtain all relevant labour registrations and comply with all relevant labour laws applying to its employees, and shall duly pay them and afford to them all their legal rights.
- (b) The Contractor shall make all deductions of tax at source and all contributions to the Payment of Gratuity, Provident Fund (including Employees' contribution) and Employees' State Insurance Scheme as may be required by Applicable Laws and deposit the aforesaid contributed amount with the appropriate authority/(s).
- (c) The Contractor shall require all personnel engaged in the Works to obey all Applicable Laws and regulations. The Contractor shall permit Authority to witness labour payments for the Contractors direct labour, or the Subcontractors labour. The Contractor shall ensure that all its Subcontractors strictly comply with all labour laws.
- (d) Documentary evidence confirming compliance with Sub-Clause 12.4, as maybe required from time to time, shall be provided to the Employer's Representative.
- (e) The Employer shall not be liable for any delay/default of the Contractor in compliance of the labour laws.

(v) Facilities for Staff and Labour

The Contractor shall provide and maintain all necessary accommodation and welfare facilities for personnel engaged for the Works. The Contractor shall not permit any personnel engaged for the Works to maintain any temporary or permanent living quarters within the structures forming part of the Works.

(vi) Health And Safety

All necessary precautions shall be taken by the Contractor to ensure the health and safety of staff and labour engaged for the Works. The Contractor shall, in collaboration with and to the requirements of the local health authorities, ensure that para-medical staff, first aid facilities, ambulance service are available on the Site at all times, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The Contractor shall appoint a safety officer to be responsible for the safety of personnel on the Site. This

safety officer shall be qualified for his work and shall have the authority to issue instructions concerning safety and take protective measures to prevent accidents. The Contractor shall maintain records and make reports concerning health, safety and welfare of personnel, and damage to property, in such manner as the Authority may reasonably require.

(vii) Contractor's Personnel

The Contractor shall employ only personnel who are appropriately qualified, skilled and experienced in their respective trades or occupations. The Authority may require the Contractor to remove any personnel engaged for the Works, who in the opinion of the Authority:

- (a) has engaged in any misconduct;
- (b) is incompetent or negligent in the performance of his duties;
- (c) fails to conform with any provisions of the Contract;
- (d) engages in any conduct which is prejudicial to safety, health, or the protection of the environment; or
- (e) makes errors in the discharge of his functions.

If appropriate and required by the Employer, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

(viii) Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst its personnel, and to preserve peace and protection of people and property in the neighborhood of the Works

Article 12

Completion Certificate

12.1 Tests on Completion

- (i) At least 30 (thirty) days prior to the likely completion of the Project Highway, or a Section thereof, the Contractor shall notify the Authority's Engineer of its intent to subject the Project Highway or a Section thereof, to Tests. The date and time of each of the Tests shall be determined by the Authority's Engineer in consultation with the Contractor and notified to the Authority who may designate its representative to witness the Tests. The Contractor shall either conduct the Tests as directed by the Authority's Engineer or provide such assistance as the Authority's Engineer may reasonably require for conducting the Tests. In the event of the Contractor and the Authority's Engineer failing to mutually agree on the dates for conducting the Tests, the Contractor shall fix the dates by giving not less than 10 (ten) days' notice to the Authority's Engineer.
- (ii) All Tests shall be conducted in accordance with Schedule-K. The Authority's Engineer shall either conduct or observe, monitor and review the Tests conducted by the Contractor, as the case may be, and review the results of the Tests to determine compliance of the Project Highway or a Section thereof with Specifications and Standards and if it is reasonably anticipated or determined by the Authority's Engineer during the course of any Test that the performance of the Project Highway or Section or any part thereof, does not meet the Specifications and Standards, it shall have the right to suspend or delay such Test and require the Contractor to remedy and rectify the Defect or deficiencies. Upon completion of each Test, the Authority's Engineer shall provide to the Contractor and the Authority copies of all Test data including detailed Test results. For the avoidance of doubt, it is expressly agreed that the Authority's Engineer may require the Contractor to carry out or cause to be carried out additional Tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway or Section thereof with the Specifications and Standards.

12.2 Completion Certificate

- (i) Upon completion of all Works forming part of the Project Highway, and the Authority's Engineer determining the Tests to be successful and after the receipt of notarized true copies of the certificate(s) of insurance, copies of insurance policies and premium payment receipts in respect of the insurance defined in Article 20 and Schedule P of this Agreement, it shall, at the request of the Contractor forthwith issue to the Contractor, with prior approval of the Authority and a copy to the Authority a certificate in the form set forth in Schedule-L (the "Completion Certificate").

- (ii) The completion certificate shall be issued by the Authority's Engineer with the prior approval of Authority, as per Schedule-N of the Contract Agreement. Authority or Authority Representative shall also ensure that the completion certificate is approved after verifying/confirming that all works/items including ancillary items forming part of the project Highway are completed in all respects conforming to the Standard and Specifications of the Ministry. A video of completed work on the date of completion shall invariably be prepared and furnished as an authentic documentary evidence of completion of works within 15 days of completion without which completion certificate shall not be issued. Authority Engineer, apart from furnishing a certificate of completion and all tests as per specifications in accordance with contract, will also certify that all NCRs issued during the contract have been closed after successful rectification of defects within the completion date.
- (iii) Upon receiving the Completion Certificate, the Contractor shall remove its equipment, materials, debris and temporary works from the Site within a period of 30 (thirty) days thereof, failing which the Authority may remove or cause to be removed, such equipment, materials, debris and temporary works and recover from the Contractor an amount equal to 120% (one hundred and twenty per cent) of the actual cost of removal incurred by the Authority.
- (iv) Without prejudice to the obligations of the Contractor specified in Articles 14 and 17, the property and ownership of all the completed Works forming part of the Project Highway shall vest in the Authority.

12.3 Rescheduling of Tests

If the Authority's Engineer certifies to the Authority and the Contractor that it is unable to issue the Completion Certificate, as the case may be, because of events or circumstances on account of which the Tests could not be held or had to be suspended, the Contractor shall be entitled to re-schedule the Tests and hold the same as soon as reasonably practicable.

Article 13

Change of Scope

13.1 Change of Scope

- (i) The Authority may, notwithstanding anything to the contrary contained in this Agreement, require the Contractor to make modifications/ alterations to the Works (“**Change of Scope**”) within a period of six months counted from the Appointed Date. Upon the Authority making its intention known to the Contractor for the specific Change of Scope, be it positive or negative, the Contractor shall submit his proposal for the said Change of Scope involving additional cost or reduction in cost. Any such Change of Scope shall be made and valued in accordance with the provisions of this Article 13.
- (ii) Provided that any such Change of Scope, excluding major structures (e.g. Major Bridge/ ROB/ RUB/ Flyover/ elevated road of more than 50 m length) may be required and agreed to be executed between the parties beyond the period of six months of the Appointed Date but before expiry of 50% of the original Scheduled Construction Period of the Project Highway, subject to the condition that it shall not entail any claims (e.g. Extension of Time/ Prolongation related claims), against the Authority.
- (iii) The Change of Scope shall mean the following:
 - (a) change in specifications of any item of Works;
 - (b) omission of any work from the Scope of the Project except under Clause 8.3(iii); provided that, subject to Clause 13.5, the Authority shall not omit any Work under this Clause in order to get it executed by any other authority; and / or
 - (c) any additional Work, Plant, Materials or services which are not included in the Scope of the Project, including any associated Tests on completion of construction

13.2 Procedure for Change of Scope

- (i) In the event of the Authority determining that a Change of Scope is necessary, it may direct the Authority’s Engineer to issue to the Contractor a notice specifying in reasonable detail the Works and services contemplated thereunder (the “**Change of Scope Notice**”). The Contractor shall submit a detailed proposal as per Clause 13.2(iii) within 15 days from the receipt of Change of Scope Notice.
 - (ii) If the Contractor determines, not later than 90 days from the Appointed Date, that a Change of Scope to the Works is required, it shall prepare a proposal with relevant

details as per Clause 13.2 (iii) at its own cost and shall submit to the Authority to consider such Change of Scope (the “**Change of Scope Request**”).

- (iii) Upon receipt of a Change of Scope Notice, the Contractor shall, with due diligence, provide to the Authority and the Authority’s Engineer such information as is necessary, together with detailed proposal in support of:
- (a) the impact, if any, which the Change of Scope is likely to have on the Project Completion Schedule if the works or services are required to be carried out during the Construction Period; and
 - (b) the options for implementing the proposed Change of Scope and the effect, if any, each such option would have on the costs and time thereof, including the following details:
 - i. break-up of the quantities, unit rates and cost for different items of work; and
 - ii. proposed design for the Change of Scope;
 - iii. proposed modifications, if any, to the Project Completion Schedule of the Project Highway.

For the avoidance of doubt, the Parties expressly agree that, subject to the provisions of Clause 13.4 (ii), the Contract Price shall be increased or decreased, as the case may be, on account of any such Change of Scope.

- (iv) The parties agree that costs and time for implementation of the proposed Change of Scope shall be determined as per the following:
- (a) For works where Schedule of Rates (SOR) of concerned circle of State’s Public Works Department are applicable at the Base Date are available, the same shall be applicable for determination of costs. In case of non-availability of Schedule of Rates at the Base Date, the available Schedule of Rates shall be applied by updating the same based on WPI. In case the Contract Price is lower/ higher than the Estimated Project Cost as per RFP, then the SOR rates shall be reduced/ increased in the same proportion accordingly.
 - (b) For item of Works not included in Schedule of Rates as mentioned in sub-paragraph (a) of Clause 13.2 (iv) above, the cost of same shall be derived on the basis of MORTH Standard Data Book and the Authority’s Engineer shall determine the prevailing market rates and discount the same considering WPI to achieve the prevailing rate at the Base Date, and for any item in respect of which MORTH Standard Data Book does not provide the requisite details, the Authority’s Engineer shall determine the rate in accordance with Good Industry Practice.

In case of any difference in the cost (regardless of % difference), the contractor and the authority shall negotiate and agree on the cost. In case of failure to agree on the cost, it shall be resolved following the dispute resolution procedure stated under the contract.

- (c) The design charges shall be considered only for new works or items (i.e. the Works or items not similar to the works or items in the original scope) @ 1%(one per cent) of cost of such new works or items.
 - (d) The costs of existing works or items, which are being changed/ omitted shall also be valued as per above procedure and only net cost shall be considered.
 - (e) The reasonable time for completion of works to be taken under Change of Scope shall be determined by the Authority's Engineer on the basis of Good Industry Practice and if such time exceeds the Scheduled Completion Date, the issue of Completion Certificate shall not be affected or delayed on account of construction of Change of Scope items/ works remaining incomplete on the date of Tests.
- (v) Upon consideration of the detailed proposal submitted by the Contractor under the Clause 13.2 (iii), the Authority, within 15 (fifteen) days of receipt of such proposal, may in its sole discretion either accept such Change of Scope with modifications, if any, and initiate proceedings thereof in accordance with this Article 13 or reject the proposal and inform the Contractor of its decision and shall issue an order (the "**Change of Scope Order**") requiring the Contractor to proceed with the performance thereof.

For the avoidance of doubt, the Parties agree that the Contractor shall not undertake any Change of Scope without the express consent of the Authority, save and except any works necessary for meeting any Emergency, that too with verbal approval of Authority which shall be confirmed in writing in next 3 (three) days. In the event that the Parties are unable to agree, the Authority may:

- (a) issue a Change of Scope Order requiring the Contractor to proceed with the performance hereof at the rates and conditions approved by the Authority till the matter is resolved in accordance with Article 26;
 - or
 - (b) proceed in accordance with Clause 13.5.
- (vi) The provisions of this Agreement, insofar as they relate to Works and Tests, shall apply *mutatis mutandis* to the Works undertaken by the Contractor under this Article 13.

13.3 Payment for Change of Scope

Payment for Change of Scope shall be made in accordance with the payment schedule specified in the Change of Scope Order.

13.4 Restrictions on Change of Scope

- (i) No Change of Scope shall be executed unless the Authority has issued the Change of Scope Order save and except any Works necessary for meeting any Emergency.
- (ii) The total value of all Change of Scope Orders shall not exceed 10% (ten per cent) of the Contract Price.
- (iii) Notwithstanding anything to the contrary in this Article 13, if any change is necessitated because of any default of the Contractor in the performance of its obligations under this Agreement, the same shall not be deemed to be Change of Scope, and shall not result in any adjustment of the Contract Price or the Project Completion Schedule.

13.5 Power of the Authority to undertake Works

- (i) In the event the Parties are unable to agree to the proposed Change of Scope Orders in accordance with Clause 13.2, the Authority may, after giving notice to the Contractor and considering its reply thereto, award such Works or services to any person or agency on the basis of open competitive bidding. It is also agreed that the Contractor shall provide assistance and cooperation to the person or agency who undertakes the works or services hereunder. The Contractor shall not be responsible for rectification of any Defects, but the Contractor shall carry out maintenance of such works after completion of Defect Liability Period of work by other person or agency during the remaining period of this Agreement without any extra payment.
- (ii) The Works undertaken in accordance with this Clause 13.5 shall conform to the Specifications and Standards and shall be carried out in a manner that minimizes the disruption in operation of the Project Highway. The provisions of this Agreement, in so far as they relate to Works and Tests, shall apply *mutatis mutandis* to the Works carried out under this Clause 13.5.

Article 14

Maintenance

14.1 Maintenance obligations of the Contractor

- (i) The Contractor shall maintain the Project Highway for a period of [05 (Five)] years, corresponding to the Defects Liability Period, commencing from the date of the Completion Certificate (the “Maintenance Period”). For the performance of its Maintenance obligations, the Contractor shall be paid:
- (a) Deleted
 - (b) For Flexible, Rigid pavement, Bridges works/Elevated Road/Structures with all allied works and facilities, consisting of permanent works and part of the project with 05 years Maintenance Period including structures: no maintenance charges shall be paid for the first year; 0.25% of the Contract Price each for the second and third year; and 0.5% of the Contract Price for the fourth and fifth year.
 - (c) Deleted
 - (d) Deleted

Above amount for the performance of Contractors' Maintenance obligations shall be, inclusive of all taxes. The amount payable for maintenance shall be adjusted to reflect any increase or decrease arising out of variation in WPI to be determined in accordance with the provisions of Clause 19.12. It is further agreed that the Contract Price hereunder shall be reckoned with reference to the amount specified in Clause 19.1 (i), which shall be adjusted to the extent of Change of Scope and the works withdrawn under the provisions of Clause 8.3 (iii), but shall not include any price adjustments in pursuance of Clause 19.10.

- (ii) During the Maintenance Period, the Authority shall provide to the Contractor access to the Site for Maintenance in accordance with this Agreement. The obligations of the Contractor hereunder shall include:
- (a) permitting safe, smooth and uninterrupted flow of traffic on the Project Highway;
 - (b) undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices. For the avoidance of doubt, the electricity charges for operation of electrical infrastructure installed along the project length, except the infrastructure being used by the Contractor for its own use, shall be borne by the Authority;
 - (c) Undertaking repairs to structures;

- (d) Informing the Authority of any unauthorized use of the Project Highway;
 - (e) Informing the Authority of any encroachments on the Project Highway; and
 - (f) operation and maintenance of all communication, patrolling, and administrative systems necessary for the efficient maintenance of the Project Highway in accordance with the provisions of this Agreement.
- (iii) In respect of any Defect or deficiency not specified in Schedule-E, the Contractor shall, at its own cost, undertake repair or rectification in accordance with Good Industry Practice, save and except to the extent that such Defect or deficiency shall have arisen on account of any willful default or neglect of the Authority or a Force Majeure Event.
- (iv) The Contractor shall remove promptly from the Project Highway any waste materials (including hazardous materials and waste water), rubbish and other debris (including, without limitation, accident debris) and keep the Project Highway in a clean, tidy and orderly condition, and in conformity with the Applicable Laws, Applicable Permits and Good Industry Practice.

14.2 Maintenance Requirement

The Contractor shall ensure and procure that at all times during the Maintenance Period, the Project Highway conforms to the maintenance requirements set forth in Schedule-E (the “**Maintenance Requirements**”).

14.3 Maintenance Programme

- (i) The Contractor shall prepare a monthly maintenance programme (the “**Maintenance Programme**”) in consultation with the Authority’s Engineer and submit the same to the Authority’s Engineer not later than 10 (ten) days prior to the commencement of the month in which the Maintenance is to be carried out. For this purpose a joint monthly inspection by the Contractor and the Authority’s Engineer shall be undertaken. The Maintenance Programme shall contain the following:
- (a) The condition of the road in the format prescribed by the Authority’s Engineer;
 - (b) The proposed maintenance Works; and
 - (c) Deployment of resources for maintenance Works.

14.4 Safety, vehicle breakdowns and accidents

- (i) The Contractor shall ensure safe conditions for the Users, and in the event of unsafe conditions, lane closures, diversions, vehicle breakdowns and accidents, it shall follow the relevant operating procedures for removal of obstruction and debris without delay. Such procedures shall conform to the provisions of this Agreement, Applicable Laws, Applicable Permits and Good Industry Practice.

- (ii) The Contractor shall maintain and operate a round-the-clock with 1 (one) mobile crane having the capacity to lift a truck with a Gross Vehicle Weight of 30,000 (thirty thousand) kilograms. The Contractor shall promptly remove any damaged vehicles and debris from the Project Highway to enable safe movement of traffic and shall report all accidents to the police forthwith.

14.5 Lane closure

- (i) The Contractor shall not close any lane of the Project Highway for undertaking maintenance works except with the prior written approval of the Authority's Engineer. Such approval shall be sought by the Contractor through a written request to be made at least 10 (ten) days before the proposed closure of lane and shall be accompanied by particulars thereof. Within 5 (five) business days of receiving such request, the Authority's Engineer shall grant permission with such modifications as it may deem necessary and a copy of such permission shall be sent to the Authority.
- (ii) Upon receiving the permission pursuant to Clause 14.5 (i), the Contractor shall be entitled to close the designated lane for the period specified therein, and for all lane closures extending a continuous period of 48 (forty-eight) hours, the Contractor shall, in the event of any delay in re-opening such lane, for every stretch of 250 (two hundred and fifty) meters, or part thereof, pay Damages to the Authority calculated at the rate of 0.1% (zero point one per cent) of the monthly maintenance payment for each day of delay until the lane has been re-opened for traffic. In the event of any delay in re-opening such lanes or in the event of emergency decommissioning and closure to traffic of the whole or any part of the Project Highway due to failure of the Contractor, the Contractor shall pay damages to the Authority at double the above rate, without prejudice the rights of the Authority under this Agreement including Termination thereof.

14.6 Reduction of payment for non-performance of Maintenance obligations

- (i) In the event that the Contractor fails to repair or rectify any Defect or deficiency set forth in Schedule-E within the period specified therein, it shall be deemed as failure of performance of Maintenance obligations by the Contractor and the Authority shall be entitled to effect reduction in monthly lump sum payment for maintenance in accordance with Clause 19.7 and Schedule-M, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.
- (ii) If the nature and extent of any Defect justifies more time for its repair or rectification than the time specified in Schedule-E, the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Authority's Engineer and conveyed to the Contractor and the Authority with reasons thereof.

14.7 Authority's right to take remedial measures

In the event the Contractor does not maintain and/or repair the Project Highway or any part thereof in conformity with the Maintenance Requirements, the Maintenance Manual or the Maintenance Programme, as the case may be, and fails to commence remedial works within 15 (fifteen) days of receipt of the Maintenance Inspection Report under Clause 15.2 or a notice in this behalf from the Authority or the Authority's Engineer, as the case may be, the Authority shall, without prejudice to its rights under this Agreement including Termination thereof, be entitled to undertake such remedial measures at the cost of the Contractor, and to recover its cost from the Contractor. In addition to recovery of the aforesaid cost, a sum equal to 20% (twenty percent) of such cost shall be paid by the Contractor to the Authority as Damages.

14.8 Restoration of loss or damage to Project Highway

Save and except as otherwise expressly provided in this Agreement, in the event that the Project Highway or any part thereof suffers any loss or damage during the Maintenance from any cause attributable to the Contractor, the Contractor shall, at its cost and expense, rectify and remedy such loss or damage forthwith so that the Project Highway conforms to the provisions of this Agreement.

14.9 Overriding powers of the Authority

- (i) If in the reasonable opinion of the Authority, the Contractor is in material breach of its obligations under this Agreement and, in particular, the Maintenance Requirements, and such breach is causing or likely to cause material hardship or danger to the Users and pedestrians, the Authority may, without prejudice to any of its rights under this Agreement including Termination thereof, by notice require the Contractor to take reasonable measures immediately for rectifying or removing such hardship or danger, as the case may be.
- (ii) In the event that the Contractor, upon notice under Clause 14.9 (i), fails to rectify or remove any hardship or danger within a reasonable period, the Authority may exercise overriding powers under this Clause 14.9 (ii) and take over the performance of any or all the obligations of the Contractor to the extent deemed necessary by it for rectifying or removing such hardship or danger; provided that the exercise of such overriding powers by the Authority shall be of no greater scope and of no longer duration than is reasonably required hereunder; provided further that any costs and expenses incurred by the Authority in discharge of its obligations hereunder shall be recovered by the Authority from the Contractor, and the Authority shall be entitled to deduct any such costs and expenses incurred from the payments due to the Contractor under Clause 19.7 for the performance of its Maintenance obligations.
- (iii) In the event of a national emergency, civil commotion or any other circumstances specified in Clause 21.3, the Authority may take over the performance of any or all the obligations of

the Contractor to the extent deemed necessary by it, and exercise such control over the Project Highway or give such directions to the Contractor as may be deemed necessary; provided that the exercise of such overriding powers by the Authority shall be of no greater scope and of no longer duration than is reasonably required in the circumstances which caused the exercise of such overriding power by the Authority. For the avoidance of doubt, it is agreed that the consequences of such action shall be dealt in accordance with the provisions of Article 21. It is also agreed that the Contractor shall comply with such instructions as the Authority may issue in pursuance of the provisions of this Clause 14.9 (iii), and shall provide assistance and cooperation to the Authority, on a best effort basis, for performance of its obligations hereunder.

14.10 Taking over Certificate

The Maintenance Requirements set forth in Schedule-E having been duly carried out, Maintenance Period as set forth in Clause 14.1 (i) having been expired and Authority's Engineer determining the Tests on Completion of Maintenance to be successful in accordance with Schedule-Q, the Authority will issue Taking Over Certificate to the Contractor substantially in the format set forth in Schedule-R. Performance of the Contractor's obligations shall not be deemed completed until the Authority has issued the Taking Over Certificate to the Contractor in the format set forth in the Schedule-S.

Article 15

Supervision and Monitoring during Maintenance

15.1 Inspection by the Contractor

- (i) The Authority's Engineer shall undertake regular inspections to evaluate continuously the compliance with the Maintenance Requirements.
- (ii) The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system in accordance with the guidelines contained in IRC: SP35. Report of this inspection together with details of proposed maintenance works as required shall be conveyed to the Authority's Engineer forthwith. The Contractor shall complete the proposed maintenance works before the onset of the monsoon and send a compliance report to the Authority's Engineer. Post monsoon inspection shall be undertaken by the Contractor and the inspection report together with details of any damages observed and proposed action to remedy the same shall be conveyed to the Authority's Engineer forthwith.

15.2 Inspection and payments

- (i) The Authority's Engineer may inspect the Project Highway at any time, but at least once every month, to ensure compliance with the Maintenance Requirements. It shall make a report of such inspection ("**Maintenance Inspection Report**") stating in reasonable detail the Defects or deficiencies, if any, with particular reference to the Maintenance Requirements, the Maintenance Manual, and the Maintenance Programme, and send a copy thereof to the Authority and the Contractor within 10 (ten) days of such inspection.
- (ii) After the Contractor submits to the Authority's Engineer the Monthly Maintenance Statement for the Project Highway pursuant to Clause 19.6, the Authority's Engineer shall carry out an inspection within 10 (ten) days to certify the amount payable to the Contractor. The Authority's Engineer shall inform the Contractor of its intention to carry out the inspection at least 3 (three) business days in advance of such inspection. The Contractor shall assist the Authority's Engineer in verifying compliance with the Maintenance Requirements.
- (iii) For each case of non-compliance of Maintenance Requirements as specified in the inspection report of the Authority's Engineer, the Authority's Engineer shall calculate the amount of reduction in payment in accordance with the formula specified in Schedule-M.
- (iv) Any deduction made on account of non-compliance will not be paid subsequently even after establishing the compliance thereof. Such deductions will continue to be made every month until the compliance is procured.

15.3 Tests

For determining that the Project Highway conforms to the Maintenance Requirements, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, Tests specified by it in accordance with Good Industry Practice. The Contractor shall, with due diligence, carry out or cause to be carried out all such Tests in accordance with the instructions of the Authority's Engineer and furnish the results of such Tests forthwith to the Authority's Engineer.

At any time during Maintenance Period, the Authority may appoint an external technical auditor to conduct an audit of the quality of the Works. The Auditor in the presence of the representatives of the Contractor and the Authority's Engineer shall carry out the Tests and/ or collect samples for testing in the laboratory. The timing, the testing equipment and the sample size of this audit shall be as decided by the Authority. The findings of the audit, to the extent accepted by the Authority, shall be notified to the Contractor and the Authority's Engineer for taking remedial measures. After completion of the remedial measures by the Contractor, the auditor shall undertake a closure audit and this process will continue till the remedial measures have brought the maintenance works into compliance with the Specifications and Standards. The Contractor shall provide all assistance as may be required by the auditor in the conduct of its audit hereunder. Notwithstanding anything contained in this Clause 15.3, the external technical audit shall not affect any obligations of the Contractor or the Authority's Engineer under this Agreement.

15.4 Reports of unusual occurrence

The Contractor shall, during the Maintenance Period, prior to the close of each day, send to the Authority and the Authority's Engineer, by facsimile or e-mail, a report stating accidents and unusual occurrences on the Project Highway relating to the safety and security of the Users and Project Highway. A monthly summary of such reports shall also be sent within 3 (three) business days of the closing of month. For the purposes of this Clause 15.4, accidents and unusual occurrences on the Project Highway shall include:

- (a) accident, death or severe injury to any person;
- (b) damaged or dislodged fixed equipment;
- (c) flooding of Project Highway; and
- (d) any other unusual occurrence.

Article 16

Traffic Regulation

16.1 Traffic regulation by the Contractor

(i) The Contractor shall take all the required measures and make arrangements for the safety of Users during the Construction and Maintenance of the Project Highway or a Section thereof in accordance with the provisions of MORTH Specifications. It shall provide, erect and maintain all such barricades, signs, markings, flags, and lights as may be required by Good Industry Practice for the safety of the traffic passing through the Section under construction or maintenance.

(ii) All works shall be carried out in a manner creating least interference to traffic passing through the Project Highway or a Section thereof. In sections where construction or maintenance Works on the carriageway are taken up, the Contractor shall ensure that proper passage is provided for the traffic. Where it is not possible or safe to allow traffic on part width of the carriageway, a temporary diversion of proper specification shall be constructed by the Contractor at its own cost. 'ROBOTS' may be used for diversion and control of traffic during Construction. The Contractor shall take prior approval of the Authority's Engineer for any proposed arrangement for traffic regulation during Construction and Maintenance, which approval shall not be unreasonably withheld.

Article 17

Defects Liability

17.1 Defects Liability Period

- (i) The Contractor shall be responsible for all the Defects and deficiencies, except usual wear and tear in the Project Highway or any Section thereof, till the expiry of a period of commencing from the date of Completion Certificate (the “**Defects Liability Period**”) as specified below:
- (a) 5 (five) years from the date of completion in case of a road being constructed with flexible pavement;
 - (b) 5 (five) years from the date of completion in case of road being constructed with rigid pavement;
 - (c) 5 (five) years from the date of completion in case of road being constructed with flexible pavement using perpetual design;
 - (d) 5 (five) years from the date of completion in case of all stand alone structures, e.g. Major Bridges/Elevated Road/Structure and Tunnels;
 - (e) 5 (five) years from the date of completion for the stretches where new technology/ material has been/ is proposed to be used
 - (f) 3 (three) years from the date of completion for stretches requiring renewal of Bituminous Concrete (BC) layer through either using hot-in-place recycling of the entire BC layer or providing a fresh layer of BC with 40mm thickness.
 - (g) Deleted

The Defects Liability Period shall commence from the date of the Completion Certificate. For the avoidance of any doubt, any repairs or restoration because of usual wear or tear in the Project Highway or any Section thereof shall form a part of the Maintenance obligations of the Contractor as specified in Article 14.

17.2 Remedying Defects

Save and except as provided in Clause 14.1 (iii), the Contractor shall repair or rectify all Defects and deficiencies observed by the Authority or Authority’s Engineer during the Defects Liability Period within a period of 15 (fifteen) days from the date of notice issued by the Authority or Authority’s Engineer in this behalf, or within such reasonable period as may be determined by the Authority or Authority’s Engineer at the request of the Contractor, in accordance with Good Industry Practice.

17.3 Cost of remedying Defects

Any repair or rectification undertaken in accordance with the provisions of Clause 17.2, including any additional testing, shall be carried out by the Contractor at its own risk and cost, to the extent that such rectification or repair is attributable to:

- (a) the design of the Project;
- (b) Plant, Materials or workmanship not being in accordance with this Agreement and the Specifications and Standards;
- (c) improper maintenance during construction of the Project Highway by the Contractor; and/ or
- (d) Failure by the Contractor to comply with any other obligation under this Agreement.

17.4 Contractor's failure to rectify Defects

If the Contractor fails to repair or rectify such Defect or deficiency within the period specified in Clause 17.2, the Authority shall be entitled to get the same repaired, rectified or remedied at the Contractor's cost to make the Project Highway conform to the Specifications and Standards and the provisions of this Agreement. All costs consequent thereon shall, after due consultation with the Authority and the Contractor, be determined by the Authority's Engineer. The cost so determined and an amount equal to 20% (twenty percent) of the cost as Damages shall be recoverable by the Authority from the Contractor and may be deducted by the Authority from any monies due to the Contractor.

17.5 Extension of Defects Liability Period

The Defects Liability Period shall be deemed to be extended till the identified Defects under Clause 17.2 have been remedied or rectified.

17.6 Performance Certificate- Deleted

Article 18

Authority's Engineer

18.1 Appointment of the Authority's Engineer

- (i) The Authority shall appoint a firm of Consulting Engineers or a Project Monitoring Committee (PMC) substantially in accordance with the selection criteria set forth in Schedule-N, to be the engineer under this Agreement (the “**Authority's Engineer**”). In unavoidable circumstances, Authority may appoint an officer to act as Authority's Engineer until appointment of a Consulting Engineering firm/ Supervision Consultant/ PMC.
- (ii) The officer in-charge of the Authority (CGM, BSRDC Ltd.) is responsible for the overall supervision and monitoring of the execution of project as the representative of the owner of the project. The Authority's Engineer has been appointed to assist the Authority for carrying out the functions as detailed under clause 18.2. As such, an officer of the Authority is vested with all such powers and responsibilities as are enjoined upon the Authority's Engineer and is fully competent to issue any instructions for proper monitoring and supervision of the project, either by himself or through the Authority's Engineer. Instructions issued by the concerned officer of the Authority shall have the same effect as that of the Authority's Engineer in terms of this Agreement. Wherever such concerned officer issues any instructions or notice to the Contractor, he shall endorse a copy hereof to the Authority's Engineer.
- (iii) The Authority's Engineer should be appointed within 10 days from the date of this Agreement or before declaration of Appointed Date whichever is earlier. The Authority shall notify the appointment or replacement of the Authority's Engineer to the Contractor.
- (iv) The staff of the Authority's Engineer shall include suitably qualified engineers and other professionals who are competent to assist the Authority's Engineer to carry out its duties.

18.2 Duties and authority of the Authority's Engineer

- (i) The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement and substantially in accordance with the terms of reference (“**Terms of Reference**” or “**TOR**”) set forth in Annexure-I of Schedule N, but subject to obtaining prior written approval of the Authority before determining:
 - (a) any Time Extension;
 - (b) any additional cost to be paid by the Authority to the Contractor;
 - (c) the Termination Payment;
 - (d) issuance of Completion Certificate; or
 - (e) any other matter which is not specified in (a), (b), (c) or (d) above and which creates financial liability on either Party.

- (ii) No decision or communication of the Authority's Engineer shall be effective or valid unless it is accompanied by an attested true copy of the approval of the Authority for and in respect of any matter specified in Clause 18.2 (i).
- (iii) The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month. For the avoidance of doubt, the Authority's Engineer shall include in its report, compliance of the recommendations of the Safety Consultant.

18.3 Delegation by the Authority's Engineer

- (i) The Authority's Engineer may, by order in writing, delegate any of his duties and responsibilities to suitably qualified and experienced personnel who are accountable to Authority's Engineer, or may revoke any such delegation, under intimation to the Authority and the Contractor. Provided, however, that the Authority's Engineer shall be responsible and liable for all actions and omissions of such personnel.
- (ii) Any failure of the Authority's Engineer to disapprove any work, Plant or Materials shall not constitute approval, and shall, therefore, not prejudice the right of the Authority to reject the work, Plant or Materials, which is not in accordance with the provisions of this Agreement and the Specifications and Standards.
- (iii) Notwithstanding anything stated in Clause 18.3 (i) above, the Authority's Engineer shall not delegate the authority to refer any matter for the Authority's prior approval wherever required in accordance with the provisions of Clause 18.3.

18.4 Instructions of the Authority's Engineer

- (i) The Authority's Engineer may issue instructions for remedying any Defect(s) to the Contractor. The Contractor shall take such instructions from the Authority's Engineer, or from an assistant to whom appropriate authority has been delegated under Clause 18.3.
- (ii) The instructions issued by the Authority's Engineer shall be in writing. However, if the Authority's Engineer issues any oral instructions to the Contractor, it shall confirm the oral instructions in writing within 2 (two) working days of issuing them.
- (iii) In case the Contractor does not receive the confirmation of the oral instructions within the time specified in Clause 18.4 (ii), the Contractor shall seek the written confirmation of the oral instructions from the Authority's Engineer. The Contractor shall obtain acknowledgement from the Authority's Engineer of the communication seeking written confirmation. In case of failure of the Authority's Engineer or its delegated assistant to reply to the Contractor within 2 (two) days of the receipt of the communication from the Contractor, the Contractor may not carry out the instructions.

- (iv) In case of any dispute on any of the instructions issued by the delegated assistant, the Contractor may refer the dispute to the Authority's Engineer, who shall then confirm, reverse or vary the instructions within 3 (three) business days of the dispute being referred.

18.5 Determination by the Authority's Engineer

- (i) The Authority's Engineer shall consult with each Party in an endeavor to reach agreement wherever this Agreement provides for the determination of any matter by the Authority's Engineer. If such agreement is not achieved, the Authority's Engineer shall make a fair determination in accordance with this Agreement having due regard to all relevant circumstances. The Authority's Engineer shall give notice to both the Parties of each agreement or determination, with supporting particulars.
- (ii) Each Party shall give effect to each agreement or determination made by the Authority's Engineer in accordance with the provisions of this Agreement. Provided, however, that if any Party disputes any instruction, decision, direction or determination of the Authority's Engineer, the Dispute shall be resolved in accordance with the Dispute Resolution Procedure.

18.6 Remuneration of the Authority's Engineer

The remuneration, costs and expenses of the Authority's Engineer shall be paid by the Authority.

18.7 Termination of the Authority's Engineer

- (i) The Authority may, in its discretion, replace the Authority's Engineer at any time. However, the Authority shall ensure that alternative arrangements for appointment of another Authority's Engineer or designation of its own officer as the Authority Engineer for the intervening period are made simultaneously.
- (ii) If the Contractor has reasons to believe that the Authority's Engineer is not discharging its duties and functions in accordance with the provisions of this Agreement, it may make a written representation to the Authority and seek termination of the appointment of the Authority's Engineer. Upon receipt of such representation, the Authority shall hold a tripartite meeting with the Contractor and the Authority's Engineer and make best efforts for an amicable resolution of the representation. In the event that the appointment of the Authority's Engineer is terminated hereunder, the Authority shall appoint forthwith another Authority's Engineer in accordance with Clause 18.1 and 18.7(i).

Part IV

Financial Covenants

Article 19

Payments

19.1 Contract Price

- (i) The Authority shall make payments to the Contractor for the Works on the basis of the lump sum price accepted by the Authority in consideration of the obligations specified in this Agreement for an amount of INR (INR) (the “Contract Price”), which shall be subject to adjustments in accordance with the provisions of this Agreement. For the avoidance of doubt, the Parties expressly agree that the Contract Price shall not include the cost of Maintenance, which shall be paid separately in accordance with the provisions of Clause 19.7. The Parties further agree that save and except as provided in this Agreement, the Contract Price shall be valid and effective until issue of Completion Certificate.
- (ii) The Contract Price includes all duties, taxes, royalty, cess, charges, and fees that may be levied in accordance with the laws and regulations in force as on the Base Date on the Contractor's equipment, Plant, Materials and supplies acquired for the purpose of this Agreement and on the services performed under this Agreement. Nothing in this Agreement shall relieve the Contractor from its responsibility to pay any tax including any tax that may be levied in India on profits made by it in respect of this Agreement.
- (iii) The Contract Price shall not be adjusted for any change in costs stated in Clause 19.1 (ii) above, except as stated in Clauses 19.10 and 19.17.
- (iv) The Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs, unless otherwise provided for in this Agreement.
- (v) Unless otherwise stated in this Agreement, the Contract Price covers all the Contractor's obligations for the Works under this Agreement and all things necessary for the Construction and the remedying of any Defects in the Project Highway.
- (vi) The Contract Price shall be paid in the currency or currencies named in the Schedule-T of this Agreement. The proportions or amounts of the Local and Foreign Currencies, and the fixed rates of exchange to be used for calculating the payments, shall be as stated in Schedule-T. Payments for Change of Scope, Damages by the Authority and any other requirements as per this Agreement shall be paid in Indian Rupees. All deductions under this Agreement, payment of Damages by the Contractor and repayment of Advance by the Contractor shall be made in Indian Rupees.

19.2 Advance Payment

- (i) The Authority shall make an interest-bearing advance payment (the “**Advance Payment**”) @ “**Bank Rate + 3%**”, equal to 10 % (ten percent) of the Contract Price, exclusively for mobilisation expenses. The Advance Payment for mobilization expenses shall be made in two installments each equal to 5% (five percent) of the Contract Price. The second 5% (five

percent) mobilization advance would be released after submission of utilization certificate by the Contractor for the first 5% (five percent) advance already released earlier.

- (ii) In addition to above, the Authority shall make an additional interest-bearing Advance Payment against newly purchased key Construction equipment required for the works as per agreed Construction programme and brought to the site, if so requested by the Contractor subject to the same terms and conditions specified for Advance Payment for mobilisation expenses in this Agreement. The maximum of such advance shall be 5% (five per cent) of the Contract Price against Bank Guarantee. This advance shall be further subject to the condition that:

(a) such new equipment are considered by the Authority's Engineer to be necessary for the works and

(b) these new equipment should be procured in the name of Contractor and is verified by Authority's Engineer to have been brought to site.

The Advance Payment for mobilization expenses and for acquisition of key new Construction equipment would be deemed as interest bearing advance at the applicable interest rate (@ "Bank rate + 3%"), to be compounded annually on a reducing balance basis. The interest would be recovered along with the recovery of mobilization Advance Payment as per provision laid down for the mobilization advance recovery.

- (iii) The Contractor may apply to the Authority for the first installment of the Advance Payment at any time after the Appointed Date, along with an irrevocable and unconditional guarantee from a Bank for an amount equivalent to 110% (one hundred and ten per cent) of such installment, substantially in the form provided at Annex-III of Schedule-G, to remain effective till the complete and full repayment thereof.

- (iv) At any time, after 60 (sixty) days from the Appointed Date, the Contractor may apply to the Authority for the second installment of the Advance Payment along with an irrevocable and unconditional guarantee from a Bank for an amount equivalent to 110% (one hundred and ten per cent) of such installment, substantially in the form provided at Annex-III of Schedule-G, to remain effective till the complete and full repayment thereof.

The Contractor has the option of splitting the Bank Guarantee against Advance Payment for mobilization expenses into parts, each not less than 2.75% (two point seven five per cent) of the Contract Price. Each part of the guarantee shall remain effective till full repayment of such part advance corresponding to this bank guarantee. Such part of Bank Guarantee shall be returned to the Contractor on recovery under the Agreement of the full amount of such part guarantee within (thirty) days of the said recovery.

- (v) The Advance Payment shall be paid by the Authority to the Contractor within 15 (fifteen) days of the receipt of its respective requests in accordance with the provisions of this Clause 19.2.

- (vi) The Advance Payment shall be repaid through percentage deductions from the stage payments determined by the Authority's Engineer in accordance with Clause 19.5, as follows:
- (a) deductions shall commence in the first Stage Payment Statement;
 - (b) deductions shall be made at the rate of 15% (fifteen percent) of each Stage Payment Statement until such time as the advance payment has been repaid; provided that the advance payment shall be completely repaid prior to the time when 80% (eighty percent) of the Schedule Construction Period is over;
 - (c) if total certified stage payments (excluding the Advance Payment and deductions and repayments of retention) does not exceed 20% (twenty percent) of the Contract Price within [50% of the Scheduled Construction Period] from the Appointed Date then the Advance Payment including interest shall be recovered by encashment of the Bank Guarantee for the Advance Payment.
- (vii) If the Advance Payment has not been fully repaid prior to Termination under Clause 21.7 or Article 23, as the case may be, the whole of the balance then outstanding shall immediately become due and payable by the Contractor to the Authority. Without prejudice to the provisions of Clause 19.2 (vi), in the event of Termination for Contractor Default, the Advance Payment shall be deemed to carry interest @ "Bank Rate+5%" per annum from the date of Advance Payment to the date of recovery by encashment of the Bank Guarantee for the Advance Payment. For the avoidance of doubt, the aforesaid interest shall be payable on the unrecovered balance.

19.3 Procedure for estimating the payment for the Works

- (i) The Authority shall make interim payments to the Contractor as certified by the Authority's Engineer on completion of a stage, in length, number or area as specified and valued in accordance with the proportion of the Contract Price assigned to each item and its stage in Schedule-H.
- (ii) The Contractor shall base its claim for interim payment for the stages completed till the end of the month for which the payment is claimed, valued in accordance with Clause 19.3 (i), supported with necessary particulars and documents in accordance with this Agreement.
- (iii) Any reduction in the Contract Price arising out of Change of Scope or the works withdrawn under Clause 8.3 shall not affect the amounts payable for the items or stage payments thereof which are not affected by such Change of Scope or withdrawal. For avoidance of doubt and by way of illustration, the Parties agree that if the amount assigned to Major Bridges is reduced from Rs. 100 crore to Rs. 80 crore owing to Change of Scope or withdrawal of work, the reduction in payment shall be restricted to relevant payments for Major Bridges only and the payment due in respect of all other stage payments under the item Major Bridges shall not be affected in any manner. The Parties further agree that the

adjustments arising out of the aforesaid modifications shall be carried out in a manner that the impact of such modifications is restricted to the said Change of Scope or withdrawal, as the case may be, and does not alter the payments due for and in respect of items or stage payments which do not form part of such Change of Scope or withdrawal.

19.4 Stage Payment Statement for Works

The Contractor shall submit a statement (the “Stage Payment Statement”), in 3 (three) copies, by the 7th (seventh) day of the month to the Authority’s Engineer in the form set forth in Schedule-O, showing the amount calculated in accordance with Clause 19.3 to which the Contractor considers himself entitled for completed stage(s) of the Works. The Stage Payment Statement shall be accompanied with the progress reports and any other supporting documents. The Contractor shall not submit any claim for payment of incomplete stages of work.

19.5 Stage Payment for Works

- (i) Within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, the Authority’s Engineer shall broadly determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment against the Stage Payment Statement pending issue of the Interim Payment Certificate by the Authority’s Engineer. Within 10 (ten) days of the receipt of recommendation of the Authority’s Engineer, the Authority shall make electronic payment directly to the Contractor’s bank account.
- (ii) Within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, the Authority’s Engineer shall determine and shall deliver to the Authority and the Contractor an IPC certifying the amount due and payable to the Contractor, after adjusting the payments already released to the Contractor against the said statement. For the avoidance of doubt, the Parties agree that the IPC shall specify all the amounts that have been deducted from the Stage Payment Statement and the reasons therefor.
- (iii) In cases where there is a difference of opinion as to the value of any stage, the Authority’s Engineer’s view shall prevail and interim payments shall be made to the Contractor on this basis, provided that the foregoing shall be without prejudice to the Contractor’s right to raise a Dispute.
- (iv) The Authority’s Engineer may, for reasons to be recorded, withhold from payment:
 - (a) the estimated value of work or obligation that the Contractor has failed to perform in accordance with this Agreement and the Authority’s Engineer had notified the Contractor; and
 - (b) the estimated cost of rectification of work done being not in accordance with this Agreement.

- (v) Payment by the Authority shall not be deemed to indicate the Authority's acceptance, approval, consent or satisfaction with the work done.

19.6 Monthly Maintenance Statement of the Project Highway

- (i) The Contractor shall submit to the Authority's Engineer a monthly maintenance statement ("**Monthly Maintenance Statement**") in 3 (three) copies by the 7th (seventh) day of each month in the format set forth in Schedule-O for the Maintenance of the Project Highway during the previous month.
- (ii) The monthly lump sum amount payable for Maintenance shall be 1/12th (one- twelfth) of the annual cost of Maintenance as specified in Clause 14.1 (i).

19.7 Payment for Maintenance of the Project Highway

- (i) Within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6, the Authority's Engineer shall verify the Contractor's monthly maintenance statement and certify the amount to be paid to the Contractor taking into account:
 - (a) Compliance with the Maintenance Requirements; and
 - (b) reduction for non-compliance with the Maintenance Requirement in accordance with Clause 19.7 (ii).

The Authority's Engineer shall deliver to the Authority an IPC approving or amending the monthly maintenance statement to reflect the amount due to the Contractor in accordance with this Agreement.

- (ii) Maintenance shall be measured in units of one kilometer each; provided, however, that payment thereof shall be made in fixed monthly amounts in accordance with this Agreement. If the Maintenance Requirements set forth in Schedule-E are not met, reduction in payments shall be made in accordance with the provisions of Schedule-M. The reductions for non-compliance with the Maintenance Requirements shall be applied on the basis of monthly inspections by the Authority's Engineer.
- (iii) The deduction made on account of non-compliance with the Maintenance Requirements shall not be subsequently considered for payment after the compliance is achieved by repair or rectification.
- (iv) The Authority shall pay to the Contractor every quarter any amount due under any IPC under this Clause 19.7. The payment shall be made no later than 30 (thirty) days from the date of submission of the last IPC for the relevant quarter..

19.8 Payment of Damages

- (i) The Contractor may claim Damages due and payable to it in accordance with the provisions of this Agreement.
- (ii) The Authority's Engineer shall issue the IPC within 15 (fifteen) days of the receipt of the claim under Clause 19.8 (i), after making adjustments in accordance with the provisions of this Agreement. The Authority shall pay to the Contractor the amount due under any IPC within a period of 30 (thirty) days from the date of the submission of the claim under this Clause 19.8. In the event of the failure of the Authority to make payment to the Contractor within the specified time, the Authority shall be liable to pay to the Contractor interest thereon and the provisions of Clause 19.9 shall apply mutatis mutandis thereto.

19.9 Time of payment and interest

- (i) The Authority shall pay to the Contractor any amount due under any payment certificate issued by the Authority's Engineer in accordance with the provisions of this Article 19, or in accordance with any other clause of this Agreement as follows:
 - (a) payment shall be made no later than 30 (thirty) days from the date of submission of the Stage Payment Statement by the Contractor to the Authority's Engineer for certification in accordance with the provisions of Clause 19.4 for an IPC ; provided that, in the event the IPC is not issued by the Authority's Engineer within the aforesaid period of 30 (thirty) days, the Authority shall pay the amount shown in the Contractor's Stage Payment Statement and any discrepancy therein shall be added to, or deducted from, the next payment certificate issued to the Contractor; and
 - (b) payment shall be made no later than 30 (thirty) days from the date of submission of the Final Payment Certificate for Works along with the discharge submitted to the Authority's Engineer in accordance with the provisions of Clause 19.15 for certification.
- (ii) In the event of the failure of the Authority to make payment to the Contractor within the time period stated in this Clause 19.9, the Authority shall be liable to pay to the Contractor interest @ Bank Rate + 3% per annum, on all sums remaining unpaid from the date on which the same should have been paid, calculated in accordance with the provisions of sub-Clauses (a) and (b) of Clause 19.9 (i) and till the date of actual payment.

19.10 Price adjustment for the Works

- (i) The amounts payable to the Contractor for Works shall be adjusted in accordance with the provisions of this Clause 19.10
- (ii) Subject to the provisions of Clause 19.10 (iii), the amounts payable to the Contractor for Works, shall be adjusted in the IPC issued by the Authority's Engineer for the increase or decrease in the index cost of inputs for the Works, by the addition or subtraction of the amounts determined by the formulae prescribed in Clause 19.10(iv).

(iii) To the extent that full compensation for any increase or decrease in costs to the Contractor is not covered by the provisions of this or other Clauses in this Agreement, the costs and prices payable under this Agreement shall be deemed to include the amounts required to cover the contingency of such other increase or decrease of costs and prices.

(iv) The Contract Price shall be adjusted for increase or decrease in rates and price of labour, cement, steel, Plant, machinery and spares, bitumen, fuel and lubricants, and other material inputs in accordance with the principles, procedures and formulae specified below:

- (a) Price adjustment shall be applied on completion of the specified stage of the respective item of work in accordance with Schedule-H;
- (b) Adjustment for each item of work/stage shall be made separately;
- (c) The following expressions and meanings are assigned to the value of the work done:

RW= Value of work done for the completion of a stage under the following items of Schedule-H:

- i. Road works; and
- ii. Other works

BR = Value of work done for the completion of a stage under the items Major Bridges and Structures (Schedule-H)

(d) Price adjustment for changes in cost shall be paid in accordance with the following formulae:

- (i) $VRW = 0.85RW \times [PL \times (LI- LO)/LO + PA \times (AI-AO)/AO + PF \times (FI -FO)/FO) + PB \times (BI- BO)/BO + PM \times (MI-MO)/MO + PC \times (CI- CO)/CO + PS \times (SI-SO)/SO]$
- (ii) $VBR = 0.85 BR \times [PL \times (LI- LO)/LO + PA \times (AI-AO)/AO + PF \times (FI -FO)/FO) + PM \times (MI-MO)/MO + PC \times (CI- CO)/CO + PS \times (SI-SO)/SO]$

Where,

VRW = Increase or decrease in the cost of road works/other works during the period under consideration due to changes in the rates for relevant components as stated in sub-paragraph (e).

VBR = Increase or decrease in the cost of Major Bridges and Structures during the period under consideration due to changes in the rates for relevant components as stated in sub-paragraph (e).

PB, PC, PL, PM, and PS are the percentages of bitumen, cement, labour, other materials, and steel/components (including strands and cables) respectively for the relevant item as stated in sub-paragraph (e).

PA is the percentage of Plant, machinery and spares component for the relevant item as stated in sub-paragraph (e).

PF is the percentage of fuel and lubricants for the relevant items as stated in sub-paragraph (e).

AO = The wholesale price index as published by the Ministry of Commerce & Industry, Government of India (hereinafter called “WPI”) for “Manufacture of machinery for mining, quarrying and construction” for the month of the Base Date.

AI = The WPI for Manufacture of machinery for mining, quarrying and construction for the month three months prior to the month to which the IPC relates.

BO = The official retail price of bitumen at the nearest refinery at [Barauni] on the Base Date.-

BI = The official retail price of bitumen at nearest refinery at [Barauni], on the first day of the month three months prior to the month to which the IPC relates.

CO = The WPI for Ordinary Portland Cement for the month of the Base Date.

CI = The WPI for Ordinary Portland Cement for the month three months prior to the month to which the IPC relates.

FO = The official retail price of high speed diesel (HSD) oil at the existing consumer pumps of Indian Oil Corporation (“IOC”) in the State of [Bihar] on the Base Date.

FI = The official retail price of HSD at the existing consumer pumps of IOC in the State of [Bihar] on the first day of the month three months prior to the month to which the IPC relates.

LO = The consumer price index for industrial workers for the the[Munger, Jamalpur) in the State of Bihar], published by Labour Bureau, Ministry of Labour, Government of India (hereinafter called “CPI”) for the month of the Base Date.

LI = The CPI for the month three months prior to the month to which the IPC relates.

MO = The WPI for all commodities for the month of the Base Date.

MI = The WPI for all commodities for the month three months prior to the month to which the IPC relates.

SO = The WPI for MS Bright Bars Products for the month of the Base Date.

SI = The WPI for MS Bright Bars Products for the month three months prior to the month to which the IPC relates.

(e) The following percentages shall govern the price adjustment of the Contract Price

| Component | Item | | | | |
|----------------------------------|---|------------------|--------------------------|---|---|
| | Road Works | | | | Major Bridges, Elevated Road and Structures |
| | Earthwork, Granular work, and Other works | Bituminous works | Cement Concrete Pavement | Culverts, minor-bridges and other structure | |
| Labour (PL) | [20%] | [20%] | [20%] | [15%] | [15%] |
| Cement (PC) | [5%] | NIL | [20%] | [15%] | [15%] |
| Steel (PS) | NIL | NIL | NIL | [15%] | [20%] |
| Bitumen(PB) | NIL | [15%] | NIL | NIL | NIL |
| Fuel and Lubricants (PF) | [10%] | [10%] | [10%] | [10%] | [10%] |
| Other Materials (PM) | [50%] | [40%] | [35%] | [30%] | [25%] |
| Plant, machinery and spares (PA) | [15%] | [15%] | [15%] | [15%] | [15%] |
| Total | 100% | 100% | 100% | 100% | 100% |

19.11 Restrictions on price adjustment

Price adjustment shall be due and payable only in respect of the stages of Works for which the Stage Payment Statement has been submitted by the Contractor no later than 30 (thirty) days from the date of the applicable Project Milestone or the Scheduled Completion Date, as the case may be, including any Time Extension granted therefore in accordance with the provisions of this Agreement. For the avoidance of doubt, in the event of submission of any Stage Payment Statement after the period specified herein, price adjustment shall be applicable until the date of the respective Project Milestone or the Scheduled Completion Date, as the case may be.

19.12 Price adjustment for Maintenance of Project Highway

Lump sum payment for Maintenance shall be adjusted every quarter for changes in rates and prices of various inputs in accordance with the formula given below:

$$V = P \times (W^I - W^O) / W^O$$

Where

V = Increase or decrease in the quarterly lump sum payment

P = Quarterly lump sum payment due to the Contractor after adjusting any reduction in payment for non-compliance of the Maintenance Requirements

W^O = The wholesale price index (all commodities) for the month of the Base Date.

W^I = The wholesale price index (all commodities) for the first day of the quarter under consideration for determining the price adjustment.

19.13 Final Payment Statement

(i) Within 60 (sixty) days after receiving the Completion Certificate under Clause 12.2, the Contractor shall submit to the Authority's Engineer for consideration 6 (six) copies of a Final Payment Statement (the "Final Payment Statement") for Works, with supporting documents showing in detail, in the form prescribed by the Authority's Engineer:

- (a) the summary of Contractor's Stage Payment claims for Works as submitted in accordance with Clause 19.4;
- (b) the amounts received from the Authority against each claim; and
- (c) any further sums which the Contractor considers due to it from the Authority.

If the Authority's Engineer disagrees with or cannot verify any part of the Final Payment Statement, the Contractor shall submit such further information as the Authority's Engineer may reasonably require. The Authority's Engineer shall deliver to the Authority:

- i. an IPC for those parts of the Final Payment Statement which are not in dispute, along with a list of disputed items which shall then be settled in accordance with the provisions of Article 26; or
- ii. a Final Payment Certificate in accordance with Clause 19.15 if there are no disputed items.

(ii.) If the Authority's Engineer does not prescribe the form referred to in Clause 19.13 (i) within 15 (fifteen) of the date of issue of the Completion Certificate, the Contractor shall submit the statement in such form as it deems fit.

19.14 Discharge

Upon submission of the Final Payment Statement for Works under Clause 19.13, the Contractor shall give to the Authority, with a copy to the Authority's Engineer, a written discharge confirming that the total of the Final Payment Statement represents full and

final settlement of all monies due to the Contractor in respect of this Agreement for all the Works arising out of this Agreement, except for any monies due to either Party on account of any Defect. Provided that such discharge shall become effective only after the payment due has been made in accordance with the Final Payment Certificate issued pursuant to Clause 19.15.

19.15 Final Payment Certificate

- (i) Within 30 (thirty) days after receipt of the Final Payment Statement for Works under Clause 19.13, and the written discharge under Clause 19.14, and there being no disputed items of claim, the Authority's Engineer shall deliver to the Authority, with a copy to the Contractor, a final payment certificate (the "**Final Payment Certificate**") stating the amount which, in the opinion of the Authority's Engineer, is finally due under this Agreement or otherwise. For the avoidance of doubt, before issuing the Final Payment Certificate, the Authority's Engineer shall ascertain from the Authority all amounts previously paid by the Authority and for all sums to which the Authority is entitled, the balance, if any, due from the Authority to the Contractor or from the Contractor to the Authority, as the case may be.
- (ii) The Authority shall, in accordance with the provisions of Clause 19.9, pay to the Contractor the amount which is stated as being finally due in the Final Payment Certificate.

19.16 Final payment statement for Maintenance

- (i) Within 30 (thirty) days after completion of the Maintenance Period, the Contractor shall submit to the Authority's Engineer 6 (six) copies of the final payment statement for Maintenance of the Project Highway, with supporting documents showing the details set forth below in the form prescribed by the Authority's Engineer:
 - (a) the total amount claimed in accordance with clause 19.7 (i) and
 - (b) any sums which the Contractor considers to be due to it, with supporting documents.
- (ii) The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance under Clause 19.16 (i), segregating the items of amount payable from the items of amount disallowed. The Authority shall make payment on the basis of the final payment authorised by the Authority's Engineer within a period of 30 (thirty) days of the receipt of the Final Payment Statement from the Authority's Engineer.
- (iii) If the Authority's Engineer does not prescribe the form within 15 (fifteen) days of the date of issue of the Completion Certificate, the Contractor shall submit the statement in such form as it deems fit.

19.17 Change in law

- (i) If as a result of Change in Law, the Contractor suffers any additional costs in the execution of the Works or in relation to the performance of its other obligations under this Agreement, the Contractor shall, within 15 (fifteen) days from the date it becomes

reasonably aware of such addition in cost, notify the Authority with a copy to the Authority's Engineer of such additional cost due to Change in Law.

- (ii) If as a result of Change in Law, the Contractor benefits from any reduction in costs for the execution of this Agreement or in accordance with the provisions of this Agreement, either Party shall, within 15 (fifteen) days from the date it becomes reasonably aware of such reduction in cost, notify the other Party with a copy to the Authority's Engineer of such reduction in cost due to Change in Law.
- (iii) The Authority's Engineer shall, within 15 (fifteen) days from the date of receipt of the notice from the Contractor or the Authority, determine any addition or reduction to the Contract Price, as the case may be, due to the Change in Law.

19.18 Correction of Interim Payment Certificates

The Authority's Engineer may by an Interim Payment Certificate make any correction or modification in any previous Interim Payment Certificate issued by the Authority's Engineer.

19.19 Authority's claims

If the Authority considers itself to be entitled to any payment from the Contractor under any Clause of this Agreement, it shall give notice and particulars to the Contractor 20 (twenty) days before making the recovery from any amount due to the Contractor, and shall take into consideration the representation, if any, made by the Contractor in this behalf, before making such recovery.

19.20 Bonus for early completion

In the event that the Project Completion Date occurs prior to the Scheduled Completion Date, the Contractor shall be entitled to receive a payment or bonus equivalent to 0.015% (zero point zero one five per cent) of the Contract Price for each day by which the Project Completion Date precedes the Scheduled Completion Date, but subject to a maximum of 3% (three percent) of the Contract Price. Provided, however, that the payment of bonus, if any, shall be made only after the issue of the Completion Certificate. For the avoidance of the doubt, the Parties agree that for the purpose of determining the bonus payable hereunder, the works shall always be deemed to be as specified in this Contract Agreement but excluding the works deemed to be deleted from the scope of work under clause 8.3 of this Contract Agreement and the Contract Price shall always be deemed to be the amount specified in Clause 19.1 (i) after excluding the Contract Price of the Works deemed to be deleted from the Scope of Work under clause 8.3 of this Contract Agreement, and shall exclude any revision thereof for any reason. The Parties also agree that bonus shall be payable only if each work for which Time Extension has been granted is completed within respective Extended Time.

Article 20 Insurance

20.1 Insurance for Works and Maintenance

- (i) The Contractor shall effect and maintain at its own cost the insurances specified in Schedule-P and as per the requirements under the Applicable Laws.
- (ii) Subject to the provisions of Clause 21.6, the Authority and the Contractor shall, in accordance with its obligations as provided for in this Agreement, be liable to bear the cost of any loss or damage that does not fall within the scope of this Article 20 or cannot be recovered from the insurers.
- (iii) Subject to the exceptions specified in Clause 20.1 (iv) below, the Contractor shall, save and except as provided for in this Agreement, fully indemnify, hold harmless and defend the Authority from and against any and all losses, damages, costs, charges and/or claims with respect to:
 - (a) the death of or injury to any person; or
 - (b) the loss of or damage to any property (other than the Works); that may arise out of or in consequence of any breach by the Contractor of this Agreement during the execution of the Works or the remedying of any Defects therein.
- (iv) Notwithstanding anything stated above in Clause 20.1 (iii), the Authority shall fully indemnify the Contractor from and against any and all losses, damages, costs, charges, proceedings and/or claims arising out of or with respect to:
 - (a) the use or occupation of land or any part thereof by the Authority;
 - (b) the right of the Authority to execute the Works, or any part thereof, on, over, under, in or through any land;
 - (c) the damage to property which is the unavoidable result of the execution and completion of the Works, or the remedying of any Defects therein, in accordance with this Agreement; and
 - (d) the death of or injury to persons or loss of or damage to property resulting from any act or neglect of the Authority, its agents, servants or other contractors, not being employed by the Contractor.

Provided that, in the event of any injury or damage as a result of the contributory negligence of the Contractor, the Authority shall be liable to indemnify the Contractor from and against any and all losses, damages, costs, charges, proceedings and/or claims to the extent as may be proportionately determined to be the liability of the Authority, its servants or agents or other contractors not associated with the Contractor in such injury or damage.

- (v) Without prejudice to the obligations of the Parties as specified under Clauses 20.1 (iii) and 20.1 (iv), the Contractor shall maintain or effect such third party insurances as may be required under the Applicable Laws.
- (vi) The Contractor shall provide to the Authority, within 30 days of the Appointed Date, evidence of professional liability insurance maintained by its Design Director and/or consultants to cover the risk of professional negligence in the design of Works. The professional liability coverage shall be for a sum of not less than [3% (three per cent)] of the Contract Price and shall be maintained until the end of the Defects Liability Period.

20.2 Notice to the Authority

No later than 15 (fifteen) days after the date of this Agreement, the Contractor shall by notice furnish to the Authority, in reasonable detail, information in respect of the insurances that it proposes to effect and maintain in accordance with this Article 20. Within 15 (fifteen) days of receipt of such notice, the Authority may require the Contractor to effect and maintain such other insurances as may be necessary pursuant hereto, and in the event of any difference or disagreement relating to any such insurance, the Dispute Resolution Procedure shall apply.

20.3 Evidence of Insurance Cover

- (i) All insurances obtained by the Contractor in accordance with this Article 20 shall be maintained with insurers on terms consistent with Good Industry Practice. Within 10 (ten) days from the Appointed Date, the Contractor shall furnish to the Authority notarized true copies of the certificate(s) of insurance, copies of insurance policies and premia payment receipts in respect of such insurance, and no such insurance shall be cancelled, modified, or allowed to expire or lapse until the expiration of at least 45 (forty-five) days after notice of such proposed cancellation, modification or non-renewal has been delivered by the Contractor to the Authority. The Contractor shall act in accordance with the directions of the Authority. Provided that the Contractor shall produce to the Authority the insurance policies in force and the receipts for payment of the current premia.
- (ii) The Contractor shall ensure the adequacy of the insurances at all times in accordance with the provisions of this Agreement.

20.4 Remedy for failure to insure

If the Contractor shall fail to effect and keep in force all insurances for which it is responsible pursuant hereto, the Authority shall have the option to either keep in force any such insurances, and pay such premia and recover the costs thereof from the Contractor, or in the event of computation of a Termination Payment, treat an amount equal to the Insurance Cover as deemed to have been received by the Contractor.

20.5 Waiver of subrogation

All insurance policies in respect of the insurance obtained by the Contractor pursuant to this Article 20 shall include a waiver of any and all rights of subrogation or recovery of the insurers thereunder against, inter alia, the Authority, and its assigns, successors, undertakings and their subsidiaries, Affiliates, employees, insurers and underwriters, and of any right of the insurers to any set-off or counterclaim or any other deduction, whether by attachment or otherwise, in respect of any liability of any such person insured under any such policy or in any way connected with any loss, liability or obligation covered by such policies of insurance.

20.6 Contractor's waiver

The Contractor hereby further releases, assigns and waives any and all rights of subrogation or recovery against, inter alia, the Authority and its assigns, undertakings and their subsidiaries, Affiliates, employees, successors, insurers and underwriters, which the Contractor may otherwise have or acquire in or from or in any way connected with any loss, liability or obligation covered by policies of insurance maintained or required to be maintained by the Contractor pursuant to this Agreement (other than third party liability insurance policies) or because of deductible clauses in or inadequacy of limits of any such policies of insurance.

20.7 Cross liabilities

Any such insurance maintained or effected in pursuance of this Article 20 shall include a cross liability clause such that the insurance shall apply to the Contractor and to the Authority as separately insured.

20.8 Accident or injury to workmen

Notwithstanding anything stated in this Agreement, it is hereby expressly agreed between the Parties that the Authority shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or Sub-contractor, save and except as for death or injury resulting from any act, omission or wilful default of the Authority its agents or servants. The Contractor shall indemnify and keep indemnified the Authority from and against all such claims, proceedings, damages, costs, charges, and expenses whatsoever in respect of the above save and except for those acts, omissions or wilful defaults for which the Authority shall be liable.

20.9 Insurance against accident to workmen

The Contractor shall effect and maintain during the Agreement such insurances as may be required to insure the Contractor's personnel and any other persons employed by it on the Project Highway from and against any liability incurred in pursuance of this Article 20. Provided that for the purposes of this Clause 20.9, the Contractor's personnel/any person employed by the Contractor shall include the Sub-contractor and its personnel. It is further provided that, in respect of any persons employed by any Sub-contractor, the

Contractor's obligations to insure as aforesaid under this Clause 20.9 shall be discharged if the Sub-contractor shall have insured against any liability in respect of such persons in such manner that the Authority is indemnified under the policy. The Contractor shall require such Sub-contractor to produce before the Authority, when required, such policy of insurance and the receipt for payment of the current premium within 10 (ten) days of such demand being made by the Authority.

20.10 Application of insurance proceeds

The proceeds from all insurance claims, except for life and injury, shall be applied for any necessary repair, reconstruction, reinstatement, replacement, improvement, delivery or installation of the Project Highway and the provisions of this Agreement in respect of construction of works shall apply mutatis mutandis to the works undertaken out of the proceeds of insurance.

20.11 Compliance with policy conditions

Each Party hereby expressly agrees to fully indemnify the other Party from and against all losses and claims arising from its failure to comply with conditions imposed by the insurance policies effected in accordance with this Agreement.

20.12 General Requirements of Insurance Policies

The Contractor must:

- (a) immediately deposit copies of the policies or certificates of any insurance which it is required to effect under the Contract, together with receipts for the premiums;
- (b) effect all insurances for which the Contractor is responsible with an insurer approved by the Authority;
- (c) make no material changes to the terms of any insurance without the Authority's approval;
- (d) in all respects comply with any conditions stipulated in the insurance policies which the Contractor is required to effect under the Agreement or which the Authority has effected in relation to the Facility and notified to the Contractor; and shall provide all assistance to the Authority in the application for, and finalization of, such comprehensive insurance package;
- (e) regardless of the extent of settlement of claims by the underwriters or the time taken for settlement of claims, the Contractor shall make good any loss, or damage at its own cost promptly;

- (f) provide all assistance to the Authority in the application for, and finalization of, such comprehensive insurance package;
- (g) pay the Contractor's share of the insurance premiums for insurance premiums allocated under such comprehensive insurance package policy to the insurances directly to the insurance provider promptly on demand. In case the Contractor fails to make such payment in time, the Authority may elect to pay the Contractor's share and adjust it against amounts payable to the Contractor under this Agreement;
- (h) in the case of occurrence of any event leading to an insurance claim, promptly follow the procedures specified by the insurance provider, and provide full cooperation and access to the insurance provider or its representative, to settle the claim expeditiously;
- (i) require all the Sub-Contractors providing equipment and materials or services to the Contractor or the Authority to obtain, maintain and keep in force during the time in which they are involved in the performance of the Works hereunder insurance coverage consistent with the Contractor's insurance obligations, hereunder and the Contractor shall also be responsible for fulfilment of this requirement; and
- (j) the required insurance coverage and the Contractor's obligations referred to shall in no way affect or limit the Contractor's liability with respect to its performance of the Works. Nothing in this Section shall limit or relieve the Contractor of its liabilities and obligations under this Agreement.

Part V

Force Majeure and Termination

Article 21

Force Majeure

21.1 Force Majeure

As used in this Agreement, the expression “**Force Majeure**” or “**Force Majeure Event**” shall mean occurrence in India of any or all of Non-Political Event, Indirect Political Event and Political Event, as defined in Clauses 21.2, 21.3 and 21.4 respectively, if it affects the performance by the Party claiming the benefit of Force Majeure (the “**Affected Party**”) of its obligations under this Agreement and which act or event (i) is beyond the reasonable control of the Affected Party, and (ii) the Affected Party could not have prevented or overcome by exercise of due diligence and following Good Industry Practice, and (iii) has Material Adverse Effect on the Affected Party.

21.2 Non-Political Event

A Non-Political Event shall mean one or more of the following acts or events:

- (a) act of God, epidemic, extremely adverse weather conditions, lightning, earthquake, landslide, cyclone, flood, volcanic eruption, chemical or radioactive contamination or ionising radiation, fire or explosion (to the extent of contamination or radiation or fire or explosion originating from a source external to the Site);
- (b) strikes or boycotts (other than those involving the Contractor, Sub-contractors or their respective employees/ representatives, or attributable to any act or omission of any of them) interrupting supplies and services to the Project Highway for a continuous period of 24 (twenty-four) hours and an aggregate period exceeding 10 (ten) days in an Accounting Year, and not being an Indirect Political Event set forth in Clause 21.3;
- (c) any failure or delay of a Sub-contractor but only to the extent caused by another Non-Political Event;
- (d) any judgment or order of any court of competent jurisdiction or statutory authority made against the Contractor in any proceedings for reasons other than (i) failure of the Contractor to comply with any Applicable Law or Applicable Permit, or (ii) on account of breach of an Applicable Law or Applicable Permit or of any contract, or (iii) enforcement of this Agreement, or (iv) exercise of any of its rights under this Agreement by the Authority;
- (e) the discovery of geological conditions, toxic contamination or archaeological remains on the Site that could not reasonably have been expected to be discovered through a site inspection; or
- (f) any event or circumstances of a nature analogous to any of the foregoing.

21.3 Indirect Political Event

An Indirect Political Event shall mean one or more of the following acts or events:

- (a) an act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, riot, insurrection, terrorist or military action, civil commotion or politically motivated sabotage;
- (b) industry-wide or State-wide strikes or industrial action for a continuous period of 24 (twenty-four) hours and exceeding an aggregate period of 10 (ten) days in an Accounting Year;
- (c) any civil commotion, boycott or political agitation which prevents construction of the Project Highway by the Contractor for an aggregate period exceeding 10 (ten) days in an Accounting Year;
- (d) any failure or delay of a Sub-contractor to the extent caused by any Indirect Political Event;
- (e) any Indirect Political Event that causes a Non-Political Event; or
- (f) any event or circumstances of a nature analogous to any of the foregoing.

21.4 Political Event

A Political Event shall mean one or more of the following acts or events by or on account of any Government Instrumentality:

- (a) Change in Law, only if consequences thereof cannot be dealt with under and in accordance with the provisions of Clause 19.17;
- (b) compulsory acquisition in national interest or expropriation of any Project Assets or rights of the Contractor or of the Sub-Contractors;
- (c) unlawful or unauthorized or without jurisdiction revocation of, or refusal to renew or grant without valid cause, any clearance, license, permit, authorization, no objection certificate, consent, approval or exemption required by the Contractor or any of the Sub-contractors to perform their respective obligations under this Agreement; provided that such delay, modification, denial, refusal or revocation did not result from the Contractor's or any Sub-contractor's inability or failure to comply with any condition relating to grant, maintenance or renewal of such clearance, license, authorization, no objection certificate, exemption, consent, approval or permit;
- (d) any failure or delay of a Sub-contractor but only to the extent caused by another Political Event; or
- (e) any event or circumstances of a nature analogous to any of the foregoing.

21.5 Duty to report Force Majeure Event

- (i) Upon occurrence of a Force Majeure Event, the Affected Party shall by notice report such occurrence to the other Party forthwith. Any notice pursuant hereto shall include full particulars of:
 - (a) the nature and extent of each Force Majeure Event which is the subject of any claim for relief under this Article 21 with evidence in support thereof;
 - (b) the estimated duration and the effect or probable effect which such Force Majeure Event is having or will have on the Affected Party's performance of its obligations under this Agreement;
 - (c) the measures which the Affected Party is taking or proposes to take for alleviating the impact of such Force Majeure Event; and
 - (d) any other information relevant to the Affected Party's claim.
- (ii) The Affected Party shall not be entitled to any relief for or in respect of a Force Majeure Event unless it shall have notified the other Party of the occurrence of the Force Majeure Event as soon as reasonably practicable, and in any event no later than 10 (ten) days after the Affected Party knew, or ought reasonably to have known, of its occurrence, and shall have given particulars of the probable material effect that the Force Majeure Event is likely to have on the performance of its obligations under this Agreement.
- (iii) For so long as the Affected Party continues to claim to be materially affected by such Force Majeure Event, it shall provide the other Party with regular (and not less than weekly) reports containing information as required by Clause 21.5 (i), and such other information as the other Party may reasonably request the Affected Party to provide.

21.6 Effect of Force Majeure Event on the Agreement

- (i) Upon the occurrence of any Force Majeure after the Appointed Date, the costs incurred and attributable to such event and directly relating to this Agreement (the "**Force Majeure costs**") shall be allocated and paid as follows:
 - (a) upon occurrence of a Non-Political Event, the Parties shall bear their respective Force Majeure costs and neither Party shall be required to pay to the other Party any costs thereof;
 - (b) upon occurrence of an Indirect Political Event, all Force Majeure costs attributable to such Indirect Political Event, and not exceeding the Insurance Cover for such Indirect Political Event, shall be borne by the Contractor, and to the extent Force Majeure costs exceed such Insurance Cover, one half of such

- excess amount shall be reimbursed by the Authority to the Contractor for the Force Majeure events; and
- (c) upon occurrence of a Political Event, all Force Majeure costs attributable to such Political Event shall be reimbursed by the Authority to the Contractor.
 - (d) For the avoidance of doubt, Force Majeure costs may include costs directly attributable to the Force Majeure Event, but shall not include debt repayment obligations, if any, of the Contractor.
- (ii) Save and except as expressly provided in this Article 21, neither Party shall be liable in any manner whatsoever to the other Party in respect of any loss, damage, cost, expense, claims, demands and proceedings relating to or arising out of occurrence or existence of any Force Majeure Event or exercise of any right pursuant hereto.
 - (iii) Upon the occurrence of any Force Majeure Event during the Construction Period, the Project Completion Schedule for and in respect of the affected Works shall be extended on a day for day basis for such period as performance of the Contractor's obligations is affected on account of the Force Majeure Event or its subsisting effects.

21.7 Termination Notice for Force Majeure Event

- (i) If a Force Majeure Event subsists for a period of 60 (sixty) days or more within a continuous period of 120 (one hundred and twenty) days, either Party may in its discretion terminate this Agreement by issuing a Termination Notice to the other Party without being liable in any manner whatsoever, save as provided in this Article 21, and upon issue of such Termination Notice, this Agreement shall, notwithstanding anything to the contrary contained herein, stand terminated forthwith; provided that before issuing such Termination Notice, the Party intending to issue the Termination Notice shall inform the other Party of such intention and grant 15 (fifteen) days time to make a representation, and may after the expiry of such 15 (fifteen) days period, whether or not it is in receipt of such representation, in its sole discretion issue the Termination Notice.

21.8 Termination Payment for Force Majeure Event

- (i) In the event of this Agreement being terminated on account of a Non-Political Event, the Termination Payment shall be an amount equal to the sum payable under Clause 23.5. Provided that in the event Termination occurs during the Maintenance Period, the Authority's Engineer shall only determine the value of Works associated with Maintenance.
- (ii) If Termination is on account of an Indirect Political Event, the Termination Payment shall include:
 - (a) any sums due and payable under Clause 23.5; and

- (b) the reasonable cost, as determined by the Authority's Engineer, of the Plant and Materials procured by the Contractor and transferred to the Authority for use in Construction or Maintenance, only if such Plant and Materials are in conformity with the Specifications and Standards;

Provided that in the event Termination occurs during the Maintenance Period, the Authority's Engineer shall only determine the value of Works associated with Maintenance.

- (iii) If Termination is on account of a Political Event, the Authority shall make a Termination Payment to the Contractor in an amount that would be payable under Clause 23.6 (ii) as if it were an Authority Default.

21.9 Dispute resolution

In the event that the Parties are unable to agree in good faith about the occurrence or existence of a Force Majeure Event, such Dispute shall be finally settled in accordance with the Dispute Resolution Procedure; provided that the burden of proof as to the occurrence or existence of such Force Majeure Event shall be upon the Party claiming relief and/ or excuse on account of such Force Majeure Event.

21.10 Excuse from performance of obligations

If the Affected Party is rendered wholly or partially unable to perform its obligations under this Agreement because of a Force Majeure Event, it shall be excused from performance of such of its obligations to the extent it is unable to perform on account of such Force Majeure Event; provided that:

- (a) the suspension of performance shall be of no greater scope and of no longer duration than is reasonably required by the Force Majeure Event;
- (b) the Affected Party shall make all reasonable efforts to mitigate or limit damage to the other Party arising out of or as a result of the existence or occurrence of such Force Majeure Event and to cure the same with due diligence; and
- (c) when the Affected Party is able to resume performance of its obligations under this Agreement, it shall give to the other Party notice to that effect and shall promptly resume performance of its obligations hereunder.

Article 22

Suspension of Contractor's Rights

22.1 Suspension upon Contractor Default

Upon occurrence of a Contractor Default, the Authority shall be entitled, without prejudice to its other rights and remedies under this Agreement including its rights of Termination hereunder, to (i) suspend carrying out of the Works or Maintenance or any part thereof, and (ii) carry out such Works or Maintenance itself or authorise any other person to exercise or perform the same on its behalf during such suspension (the “Suspension”). Suspension hereunder shall be effective forthwith upon issue of notice by the Authority to the Contractor and may extend up to a period not exceeding 90 (ninety) days from the date of issue of such notice.

22.2 Authority to act on behalf of Contractor

During the period of Suspension hereunder, all rights and liabilities vested in the Contractor in accordance with the provisions of this Agreement shall continue to vest therein and all things done or actions taken, including expenditure incurred by the Authority for discharging the obligations of the Contractor under and in accordance with this Agreement shall be deemed to have been done or taken for and on behalf of the Contractor and the Contractor undertakes to indemnify the Authority for all costs incurred during such period. The Contractor hereby licenses and sub-licenses respectively, the Authority or any other person authorised by it under Clause 22.1 to use during Suspension, all Intellectual Property belonging to or licensed to the Contractor with respect to the Project Highway and its design, engineering, construction and maintenance, and which is used or created by the Contractor in performing its obligations under the Agreement.

22.3 Revocation of Suspension

- (i) In the event that the Authority shall have rectified or removed the cause of Suspension within a period not exceeding 60 (sixty) days from the date of Suspension, it shall revoke the Suspension forthwith and restore all rights of the Contractor under this Agreement. For the avoidance of doubt, the Parties expressly agree that the Authority may, in its discretion, revoke the Suspension at any time, whether or not the cause of Suspension has been rectified or removed hereunder.
- (ii) Upon the Contractor having cured the Contractor Default within a period not exceeding 60 (sixty) days from the date of Suspension, the Authority shall revoke the Suspension forthwith and restore all rights of the Contractor under this Agreement.

22.4 Termination

- (i) At any time during the period of Suspension under this Article 22, the Contractor may by notice require the Authority to revoke the Suspension and issue a Termination Notice. The Authority shall, within 15 (fifteen) days of receipt of such notice, terminate this Agreement under and in accordance with Article 23.
- (ii) Notwithstanding anything to the contrary contained in this Agreement, in the event that Suspension is not revoked within 90 (ninety) days from the date of Suspension hereunder, the Agreement shall, upon expiry of the aforesaid period, be deemed to have been terminated by mutual agreement of the Parties and all the provisions of this Agreement shall apply, *mutatis mutandis*, to such Termination as if a Termination Notice had been issued by the Authority upon occurrence of a Contractor Default.

Article 23

Termination

23.1 Termination for Contractor Default

- (i) Save as otherwise provided in this Agreement, in the event that any of the defaults specified below shall have occurred, and the Contractor fails to cure the default within the Cure Period set forth below, or where no Cure Period is specified, then within a Cure Period of 60 (sixty) days, the Contractor shall be deemed to be in default of this Agreement (the “**Contractor Default**”), unless the default has occurred solely as a result of any breach of this Agreement by the Authority or due to Force Majeure. The defaults referred to herein shall include:
- (a) the Contractor fails to provide, extend or replenish, as the case may be, the Performance Security in accordance with this Agreement;
 - (b) after the replenishment or furnishing of fresh Performance Security in accordance with Clause 7.3, the Contractor fails to cure, within a Cure Period of 30 (thirty) days, the Contractor Default for which the whole or part of the Performance Security was appropriated;
 - (c) the Contractor does not achieve the latest outstanding Project Milestone due in accordance with the provisions of Schedule-J, subject to any Time Extension, and continues to be in default for 45 (forty five) days;
 - (d) the Contractor abandons or manifests intention to abandon the construction or Maintenance of the Project Highway without the prior written consent of the Authority;
 - (e) the Contractor fails to proceed with the Works in accordance with the provisions of Clause 10.1 or stops Works and/or the Maintenance for 30 (thirty) days without reflecting the same in the current programme and such stoppage has not been authorised by the Authority’s Engineer;
 - (f) the Project Completion Date does not occur within the period specified in Schedule-J for the Scheduled Completion Date, or any extension thereof;
 - (g) the Contractor fails to rectify any Defect, the non-rectification of which shall have a Material Adverse Effect on the Project, within the time specified in this Agreement or as directed by the Authority’s Engineer;
 - (h) the Contractor subcontracts the Works or any part thereof in violation of this Agreement or assigns any part of the Works or the Maintenance without the prior approval of the Authority;
 - (i) the Contractor creates any Encumbrance in breach of this Agreement;

- (j) an execution levied on any of the assets of the Contractor has caused a Material Adverse Effect;
- (k) the Contractor is adjudged bankrupt or insolvent, or if a trustee or receiver is appointed for the Contractor or for the whole or material part of its assets that has a material bearing on the Project;
- (l) the Contractor has been, or is in the process of being liquidated, dissolved, wound-up, amalgamated or reconstituted in a manner that would cause, in the reasonable opinion of the Authority, a Material Adverse Effect;
- (m) a resolution for winding up or insolvency of the Contractor is passed, or any petition for winding up or insolvency of the Contractor is admitted by a court of competent jurisdiction and a provisional liquidator or receiver or interim resolution professional, as the case may be, is appointed and such order has not been set aside within 90 (ninety) days of the date thereof or the Contractor is ordered to be wound up by court except for the purpose of amalgamation or reconstruction; provided that, as part of such amalgamation or reconstruction, the entire property, assets and undertaking of the Contractor are transferred to the amalgamated or reconstructed entity and that the amalgamated or reconstructed entity has unconditionally assumed the obligations of the Contractor under this Agreement; and provided that:
 - i. the amalgamated or reconstructed entity has the capability and experience necessary for the performance of its obligations under this Agreement; and
 - ii. the amalgamated or reconstructed entity has the financial standing to perform its obligations under this Agreement and has a credit worthiness at least as good as that of the Contractor as at the Appointed Date;
- (n) any representation or warranty of the Contractor herein contained which is, as of the date hereof, found to be false or the Contractor is at any time hereafter found to be in breach or non-compliance thereof;
- (o) the Contractor submits to the Authority any statement, notice or other document, in written or electronic form, which has a material effect on the Authority's rights, obligations or interests and which is false in material particulars;
- (p) the Contractor has failed to fulfill any obligation, for which failure Termination has been specified in this Agreement; or
- (q) the Contractor commits a default in complying with any other provision of this Agreement if such a default causes a Material Adverse Effect on the Project or on the Authority.
- (r) gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an inducement or reward:

- i. for doing or forbearing to do any action in relation to the Contract, or
- ii. for showing or forbearing to show favour or disfavour to any person in relation to the Contract,

or if any of the Contractor's personnel, agents or subcontractors gives or offers to give (directly or indirectly) to any person any such inducement or reward as is described in this sub-paragraph (s). However, lawful inducements and rewards to Contractor's Personnel shall not entitle termination.

- (ii) Without prejudice to any other rights or remedies which the Authority may have under this Agreement, upon occurrence of a Contractor Default, the Authority shall be entitled to terminate this Agreement by issuing a Termination Notice to the Contractor; provided that before issuing the Termination Notice, the Authority shall by a notice inform the Contractor of its intention to issue such Termination Notice and grant 15 (fifteen) days to the Contractor to make a representation, and may after the expiry of such 15 (fifteen) days, whether or not it is in receipt of such representation, issue the Termination Notice.

(iii) The following shall apply in respect of cure of any of the defaults and/ or breaches of the Agreement:

- (a) The Cure Period shall commence from the date of the notice by the Authority to the Contractor asking the latter to cure the breach or default specified in such notice;
- (b) The Cure Period provided in the Agreement shall not relieve the Contractor from liability for Damages caused by its breach or default;
- (c) The Cure Period shall not in any way be extended by any period of suspension under the Agreement;
- (d) If the cure of any breach by the Contractor requires any reasonable action by the Contractor that must be approved by the Authority hereunder the applicable Cure Period (and any liability of the Contractor for damages incurred) shall be extended by the period taken by the Authority to accord its required approval.

- (iv) After termination of this Agreement for Contractor Default, the Authority may complete the Works and/or arrange for any other entities to do so. The Authority and these entities may then use any Materials, Plant and equipment, Contractor's documents and other design documents made by or on behalf of the Contractor.

23.2 Termination for Authority Default

(i) In the event that any of the defaults specified below shall have occurred, and the Authority fails to cure such default within a Cure Period of 90 (ninety) days or such longer period as has been expressly provided in this Agreement, the Authority shall be deemed to be in default of this Agreement (the “**Authority Default**”) unless the default has occurred as a result of any breach of this Agreement by the Contractor or due to Force Majeure. The defaults referred to herein shall include:

- (a) the Authority commits a material default in complying with any of the provisions of this Agreement and such default has a Material Adverse Effect on the Contractor;
 - (b) the Authority has failed to make payment of any amount due and payable to the Contractor within the period specified in this Agreement;
 - (c) the Authority has failed to provide, within a period of 180 (one hundred and eighty) days from the Appointed Date, the environmental clearances required for construction of the Project Highway;
 - (d) the Authority becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with its creditors, or carries on business under a receiver, trustee or manager for the benefit of its creditors, or if any act is done or event occurs which (under Applicable Laws) has a similar effect;
 - (e) the Authority repudiates this Agreement or otherwise takes any action that amounts to or manifests an irrevocable intention not to be bound by this Agreement;
 - (f) the Authority’s Engineer fails to issue the relevant Interim Payment Certificate within 60 (sixty) days after receiving a statement and supporting documents; or
 - (g) the whole work is suspended by Authority beyond 120 (one hundred twenty) days for any reason which is not attributed to the Contractor.
- (ii) Without prejudice to any other right or remedy which the Contractor may have under this Agreement, upon occurrence of an Authority Default, the Contractor shall be entitled to terminate this Agreement by issuing a Termination Notice to the Authority; provided that before issuing the Termination Notice, the Contractor shall by a notice inform the Authority of its intention to issue the Termination Notice and grant 15 (fifteen) days to the Authority to make a representation, and may after the expiry of such 15 (fifteen) days, whether or not it is in receipt of such representation, issue the Termination Notice.

If on the consideration of the Authority’s representation or otherwise, the contractor does not issue the Termination Notice on such 15th (fifteenth) day and prefers to continue with the project, it is deemed that the cause of action of the Termination Notice has been concurred by the Contractor and he would be deemed to have waived any claim and forfeited any right to any other remedy on that count or in relation to such action or omission.

23.3 Termination for Authority's convenience

Notwithstanding anything stated hereinabove, the Authority may terminate this Agreement for convenience. The termination shall take effect 30 (thirty) days from the date of notice provided to the Contractor.

23.4 Requirements after Termination

Upon Termination of this Agreement in accordance with the terms of this Article 23, the Contractor shall comply with and conform to the following:

- (a) Deliver all relevant records, reports, Intellectual Property and other licenses pertaining to the Works, Maintenance, other design documents;
- (b) Transfer and/or deliver all Applicable Permits to the extent permissible under Applicable Laws; and
- (c) vacate the Site within 15 (fifteen) days.

23.5 Valuation of Unpaid Works

(i) Within a period of 45 (forty-five) days after Termination under Clause 23.1, 23.2 or 23.3, as the case may be, has taken effect, the Authority's Engineer shall proceed in accordance with Clause 18.5 to determine as follows the valuation of unpaid Works (the "**Valuation of Unpaid Works**"):

- (a) value of the completed stage of the Works, less payments already made;
 - (b) reasonable value of the partially completed stages of works as on the date of Termination, only if such works conform with the Specifications and Standards; and
 - (c) value of Maintenance, if any, for completed months, less payments already made, and shall adjust from the sum thereof (i) any other amounts payable or recoverable, as the case may be, in accordance with the provisions of this Agreement; and (ii) all taxes due to be deducted at source.
- (ii) The Valuation of Unpaid Works shall be communicated to the Authority, with a copy to the Contractor, within a period of 30 (thirty) days from the date of Termination.

23.6 Termination Payment

(i) Upon Termination on account of Contractor's Default under Clause 23.1, the Authority shall:

- (a) encash and appropriate the Performance Security, Additional Performance Security if any and Retention Money, or in the event the Contractor has failed to replenish or extend the Performance Security and Additional Performance Security if any, claim the amount stipulated in Clause 7.1, as agreed pre- determined compensation to the Authority for any losses, delays and cost of completing the Works and Maintenance, if any;
- (b) encash and appropriate the Bank Guarantee, if any, for and in respect of the outstanding Advance Payment and interest thereon; and
- (c) pay to the Contractor, by way of Termination Payment, an amount equivalent to the Valuation of Unpaid Works after adjusting any other sums payable or recoverable, as the case may be, in accordance with the provisions of this Agreement.
- (ii) Upon Termination on account of an Authority Default under Clause 23.2 or for Authority's convenience under Clause 23.3, the Authority shall:
- (a) return the Performance Security, Additional Performance Security and Retention Money forthwith;
- (b) encash and appropriate the bank guarantee, if any, for and in respect of the outstanding Advance Payment; and
- (c) pay to the Contractor, by way of Termination Payment, an amount equal to:
- i. Valuation of Unpaid Works;
 - ii. the reasonable cost of temporary works, as determined by the Authority's Engineer; and
 - iii. 10% (ten per cent) of the cost of the Works and Maintenance that are not commenced or not completed,
- and shall adjust from the sum thereof (i) any other amounts payable or recoverable, as the case may be, in accordance with the provisions of this Agreement, and (ii) all taxes due to be deducted at source.
- (iii) Termination Payment shall become due and payable to the Contractor within 30 (thirty) days of a demand being made by the Contractor to the Authority with the necessary particulars, and in the event of any delay, the Authority shall pay interest at Bank Rate + 3% per annum, on the amount of Termination Payment remaining unpaid; provided that such delay shall not exceed 90 (ninety) days. For the avoidance of doubt, it is expressly agreed that Termination Payment shall constitute full discharge by the Authority of its payment obligations in respect thereof hereunder.
- (iv) The Contractor expressly agrees that Termination Payment under this Article 23 shall constitute a full and final settlement of all claims of the Contractor on account of

Termination of this Agreement and that it shall not have any further right or claim under any law, treaty, convention, contract or otherwise.

23.7 Other rights and obligations of the Parties

Upon Termination for any reason whatsoever:

- (a) property and ownership in all Materials, Plant and Works and the Project Highway shall, as between the Contractor and the Authority, vest in the Authority in whole; provided that the foregoing shall be without prejudice to Clause 23.6;
- (b) risk of loss or damage to any Materials, Plant or Works and the care and custody thereof shall pass from the Contractor to the Authority; and
- (c) the Authority shall be entitled to restrain the Contractor and any person claiming through or under the Agreement from entering upon the Site or any part of the Project, which have not been vested in the Authority in accordance with the provisions of this Agreement.

23.8 Survival of rights

Notwithstanding anything to the contrary contained in this Agreement any Termination pursuant to the provisions of this Agreement shall be without prejudice to the accrued rights of either Party including its right to claim and recover money damages, insurance proceeds, security deposits, and other rights and remedies which it may have in law or Agreement. All rights and obligations of either Party under this Agreement, including Termination Payments, shall survive the Termination to the extent such survival is necessary for giving effect to such rights and obligations.

23.9 Foreclosure with mutual consent - Deleted

Part VI
Other Provisions

Article 24

Assignment and Charges

24.1 Restrictions on assignment and charges

This Agreement shall not be assigned by the Contractor to any person, save and except with the prior consent in writing of the Authority, which consent the Authority shall be entitled to decline without assigning any reason.

24.2 Hypothecation of Materials or Plant

Notwithstanding the provisions of Clause 24.1, the Contractor may pledge or hypothecate to its lenders, any Materials or Plant prior to their incorporation in the Works. Further, the Contractor may, by written notice to the Authority, assign its right to receive payments under this Agreement either absolutely or by way of charge, to any person providing financing to the Contractor in connection with the performance of the Contractor's obligations under this Agreement. The Contractor acknowledges that any such assignment by the Contractor shall not relieve the Contractor from any obligations, duty or responsibility under this Agreement.

Article 25

Liability and Indemnity

25.1 General indemnity

- (i) The Contractor will indemnify, defend, save and hold harmless the Authority and its officers, servants, agents, Government Instrumentalities and Government owned and/or controlled entities/enterprises, (the “**Authority Indemnified Persons**”) against any and all suits, proceedings, actions, demands and third party claims for any loss, damage, cost and expense of whatever kind and nature, whether arising out of any breach by the Contractor of any of its obligations under this Agreement or from any negligence under the Agreement, including any errors or deficiencies in the design documents, or tort or on any other ground whatsoever, except to the extent that any such suits, proceedings, actions, demands and claims have arisen due to any negligent act or omission, or breach or default of this Agreement on the part of the Authority Indemnified Persons.

25.2 Indemnity by the Contractor

- (i) Without limiting the generality of Clause 25.1, the Contractor shall fully indemnify, hold harmless and defend the Authority and the Authority Indemnified Persons from and against any and all loss and/or damages arising out of or with respect to:
 - (a) failure of the Contractor to comply with Applicable Laws and Applicable Permits;
 - (b) payment of taxes required to be made by the Contractor in respect of the income or other taxes of the Sub-contractors, suppliers and representatives; or
 - (c) non-payment of amounts due because of Materials or services furnished to the Contractor or any of its Sub-contractors, which are payable by the Contractor or any of its Sub-contractors.
- (ii) Without limiting the generality of the provisions of this Article 25, the Contractor shall fully indemnify, hold harmless and defend the Authority Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which the Authority Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by the Contractor or by the Sub-contractors in performing the Contractor’s obligations or in any way incorporated in or related to the Project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, the Contractor shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Project Highway, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, the Contractor shall

promptly make every reasonable effort to secure for the Authority a license, at no cost to the Authority, authorising continued use of the infringing work. If the Contractor is unable to secure such license within a reasonable time, the Contractor shall, at its own expense, and without impairing the Specifications and Standards, either replace the affected work, or part, or process thereof with non-infringing work or part or process or modify the same so that it becomes non-infringing.

25.3 Notice and contest of claims

In the event that either Party receives a claim or demand from a third party in respect of which it is entitled to the benefit of an indemnity under this Article 25 (the “**Indemnified Party**”) it shall notify the other Party (the “**Indemnifying Party**”) within 15 (fifteen) days of receipt of the claim or demand and shall not settle or pay the claim without the prior approval of the Indemnifying Party, which approval shall not be unreasonably withheld or delayed. If the Indemnifying Party wishes to contest or dispute the claim or demand, it may conduct the proceedings in the name of the Indemnified Party, subject to the Indemnified Party being secured against any costs involved, to its reasonable satisfaction.

25.4 Defence of claims

- (i) The Indemnified Party shall have the right, but not the obligation, to contest, defend and litigate any claim, action, suit or proceeding by any third party alleged or asserted against such Party in respect of, resulting from, related to or arising out of any matter for which it is entitled to be indemnified hereunder, and reasonable costs and expenses thereof shall be indemnified by the Indemnifying Party. If the Indemnifying Party acknowledges in writing its obligation to indemnify the Indemnified Party in respect of loss to the full extent provided by this Article 25, the Indemnifying Party shall be entitled, at its option, to assume and control the defense of such claim, action, suit or proceeding, liabilities, payments and obligations at its expense and through the counsel of its choice; provided it gives prompt notice of its intention to do so to the Indemnified Party and reimburses the Indemnified Party for the reasonable cost and expenses incurred by the Indemnified Party prior to the assumption by the Indemnifying Party of such defense. The Indemnifying Party shall not be entitled to settle or compromise any claim, demand, action, suit or proceeding without the prior written consent of the Indemnified Party, unless the Indemnifying Party provides such security to the Indemnified Party as shall be reasonably required by the Indemnified Party to secure the loss to be indemnified hereunder to the extent so compromised or settled.
- (ii) If the Indemnifying Party has exercised its rights under Clause 25.3, the Indemnified Party shall not be entitled to settle or compromise any claim, action, suit or proceeding without the prior written consent of the Indemnifying Party (which consent shall not be unreasonably withheld or delayed).

- (iii) If the Indemnifying Party exercises its rights under Clause 25.3, the Indemnified Party shall nevertheless have the right to employ its own counsel, and such counsel may participate in such action, but the fees and expenses of such counsel shall be at the expense of the Indemnified Party, when and as incurred, unless:
- (a) the employment of counsel by such party has been authorised in writing by the Indemnifying Party; or
 - (b) the Indemnified Party shall have reasonably concluded that there may be a conflict of interest between the Indemnifying Party and the Indemnified Party in the conduct of the defense of such action; or
 - (c) the Indemnifying Party shall not, in fact, have employed independent counsel reasonably satisfactory to the Indemnified Party, to assume the defense of such action and shall have been so notified by the Indemnified Party; or
 - (d) the Indemnified Party shall have reasonably concluded and specifically notified the Indemnifying Party either:
 - i. that there may be specific defenses available to it which are different from or additional to those available to the Indemnifying Party; or
 - ii. that such claim, action, suit or proceeding involves or could have a material adverse effect upon it beyond the scope of this Agreement:

Provided that if Sub-clauses (b), (c) or (d) of this Clause 25.4 (iii) shall be applicable, the counsel for the Indemnified Party shall have the right to direct the defense of such claim, demand, action, suit or proceeding on behalf of the Indemnified Party, and the reasonable fees and disbursements of such counsel shall constitute legal or other expenses hereunder.

25.5 Survival on Termination

The provisions of this Article 25 shall survive Termination.

Article 26

Dispute Resolution

26.1 Dispute Resolution

- (i) Any dispute, difference or controversy of whatever nature howsoever arising under or out of or in relation to this Agreement (including its interpretation) between the Parties, and so notified in writing by either Party to the other Party (the “**Dispute**”) shall, in the first instance, be attempted to be resolved amicably in accordance with the conciliation procedure set forth in Clause 26.2.
- (ii) The Parties agree to use their best efforts for resolving all Disputes arising under or in respect of this Agreement promptly, equitably and in good faith, and further agree to provide each other with reasonable access during normal business hours to all non-privileged records, information and data pertaining to any Dispute.

26.2 Conciliation

In the event of any Dispute between the Parties, either Party may call upon the Authority’s Engineer, or such other person as the Parties may mutually agree upon (the “**Conciliator**”) to mediate and assist the Parties in arriving at an amicable settlement thereof. Failing mediation by the Conciliator or without the intervention of the Conciliator, either Party may require such Dispute to be referred to the Chairman of the Authority and the Chairman of the Board of Directors of the Contractor for amicable settlement, and upon such reference, the said persons shall meet no later than 7 (seven) business days from the date of reference to discuss and attempt to amicably resolve the Dispute. If such meeting does not take place within the 30 (thirty) business day period or the Dispute is not amicably settled within 30 (thirty) days of the meeting or the Dispute is not resolved as evidenced by the signing of written terms of settlement within 30 (thirty) days of the notice in writing referred to in Clause 26.1.1 or such longer period as may be mutually agreed by the Parties, either Party may refer the Dispute to arbitration in accordance with the provisions of Clause 26.3 but before resorting to such arbitration, the parties agree to explore conciliation by the Conciliation Committees of Independent Experts set up by the Authority in accordance with the procedure decided by the panel of such experts and notified by the Authority on its website including its subsequent amendments. In the event of the conciliation proceedings being successful, the parties to the dispute would sign the written settlement agreement and the conciliators would authenticate the same. Such settlement agreement would then be binding on the parties in terms of Section 73 of the Arbitration Act. In case of failure of the conciliation process even at the level of the Conciliation Committee, either party may refer the Dispute to arbitration in accordance with the provisions of Clause 26.3.

26.3 Arbitration

- (i) Any dispute which remains unresolved between the parties through the mechanisms available/ prescribed in the Agreement, irrespective of any claim value, which has not been agreed upon/ reached settlement by the parties, will be referred to the Arbitral Tribunal as per the Arbitration and Conciliation Act.
- (ii) Deleted
- (iii) The Arbitral Tribunal shall make a reasoned award (the “Award”). Any Award made in any arbitration held pursuant to this Article 26 shall be final and binding on the Parties as from the date it is made, and the Contractor and the Authority agree and undertake to carry out such Award without delay.
- (iv) The Contractor and the Authority agree that an Award may be enforced against the Contractor and/or the Authority, as the case may be, and their respective assets wherever situated.
- (v) This Agreement and the rights and obligations of the Parties shall remain in full force and effect, pending the Award in any arbitration proceedings hereunder. Further, the parties unconditionally acknowledge and agree that notwithstanding any dispute between them, each Party shall proceed with the performance of its respective obligations pending resolution of Dispute in accordance with this Article.
- (vi) In the event the Party against whom the Award has been granted challenges the Award for any reason in a court of law, it shall make an interim payment to the other Party for an amount equal to 75% (seventy five per cent) of the Award, pending final settlement of the Dispute. The aforesaid amount shall be paid forthwith upon furnishing an irrevocable Bank Guarantee for a sum equal to 120 % (one hundred and twenty per cent) of the aforesaid amount. Upon final settlement of the Dispute, the aforesaid interim payment shall be adjusted and any balance amount due to be paid or returned, as the case may be, shall be paid or returned with interest calculated at the rate of 10% (ten per cent) per annum from the date of interim payment to the date of final settlement of such balance.

26.4 Adjudication by Regulatory Authority, Tribunal or Commission

In the event of constitution of a statutory regulatory authority, tribunal or commission, as the case may be, with powers to adjudicate upon disputes between the Contractor and the Authority, all Disputes arising after such constitution shall, instead of reference to arbitration under Clause 26.3, be adjudicated upon by such regulatory authority, tribunal or commission in accordance with the Applicable Law and all references to Dispute Resolution Procedure shall be construed accordingly. For the avoidance of doubt, the Parties hereto agree that the adjudication hereunder shall not be final and binding until an appeal against such adjudication has been decided by an appellate tribunal or court of competent jurisdiction, as the case may be, or no such appeal has been preferred within the time specified in the Applicable Law.

Article 27

Miscellaneous

27.1 Governing law and jurisdiction

This Agreement shall be construed and interpreted in accordance with and governed by the laws of India, and the courts at Patna shall have exclusive jurisdiction over matters arising out of or relating to this Agreement.

27.2 Waiver of immunity

Each Party unconditionally and irrevocably:

- (a) agrees that the execution, delivery and performance by it of this Agreement constitute commercial acts done and performed for commercial purpose;
- (b) agrees that, should any proceedings be brought against it or its assets, property or revenues in any jurisdiction in relation to this Agreement or any transaction contemplated by this Agreement, no immunity (whether by reason of sovereignty or otherwise) from such proceedings shall be claimed by or on behalf of the Party with respect to its assets;
- (c) waives any right of immunity which it or its assets, property or revenues now has, may acquire in the future or which may be attributed to it in any jurisdiction; and
- (d) consents generally in respect of the enforcement of any judgement or award against it in any such proceedings to the giving of any relief or the issue of any process in any jurisdiction in connection with such proceedings (including the making, enforcement or execution against it or in respect of any assets, property or revenues whatsoever irrespective of their use or intended use of any order or judgement that may be made or given in connection therewith).

27.3 Delayed payments

The Parties hereto agree that payments due from one Party to the other Party under the provisions of this Agreement shall be made within the period set forth therein, and if no such period is specified, within 30 (thirty) days of receiving a demand along with the necessary particulars. In the event of delay beyond such period, the defaulting Party shall pay interest for the period of delay calculated at a rate equal to Base Rate plus 2 (two) percent, calculated at quarterly rests, and recovery thereof shall be without prejudice to the rights of the Parties under this Agreement including Termination thereof.

27.4 Waiver

- (i) Waiver, including partial or conditional waiver, by either Party of any default by the other Party in the observance and performance of any provision of or obligations under this Agreement:-
 - (a) shall not operate or be construed as a waiver of any other or subsequent default hereof or of other provisions of or obligations under this Agreement;
 - (b) shall not be effective unless it is in writing and executed by a duly authorized representative of the Party; and
 - (c) shall not affect the validity or enforceability of this Agreement in any manner.
- (ii) Neither the failure by either Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or any obligation there under nor time or other indulgence granted by a Party to the other Party shall be treated or deemed as waiver of such breach or acceptance of any variation or the relinquishment of any such right hereunder.

27.5 Liability for review of Documents and Drawings

Except to the extent expressly provided in this Agreement:

- (a) no review, comment or approval by the Authority or the Authority's Engineer of any Document or Drawing submitted by the Contractor nor any observation or inspection of the construction, or maintenance of the Project Highway nor the failure to review, approve, comment, observe or inspect hereunder shall relieve or absolve the Contractor from its obligations, duties and liabilities under this Agreement, the Applicable Laws and Applicable Permits, and
- (b) the Authority shall not be liable to the Contractor by reason of any review, comment, approval, observation or inspection referred to in Sub-clause (a) above.

27.6 Exclusion of implied warranties etc.

This Agreement expressly excludes any warranty, condition or other undertaking implied at law or by custom or otherwise arising out of any other agreement between the Parties or any representation by either Party not contained in a binding legal agreement executed by both Parties.

27.7 Survival

- (i) Termination shall:
 - (a) not relieve the Contractor or the Authority, as the case may be, of any obligations hereunder which expressly or by implication survive Termination hereof; and

- (b) except as otherwise provided in any provision of this Agreement expressly limiting the liability of either Party, not relieve either Party of any obligations or liabilities for loss or damage to the other Party arising out of, or caused by, acts or omissions of such Party prior to the effectiveness of such Termination or arising out of such Termination.
- (ii) All obligations surviving Termination shall only survive for a period of 3 (three) years following the date of such Termination.

27.8 Entire Agreement

This Agreement and the Schedules together constitute a complete and exclusive statement of the terms of the agreement between the Parties on the subject hereof, and no amendment or modification hereto shall be valid and effective unless such modification or amendment is agreed to in writing by the Parties and duly executed by persons especially empowered in this behalf by the respective Parties. All prior written or oral understandings, offers or other communications of every kind pertaining to this Agreement are abrogated and withdrawn. For the avoidance of doubt, the Parties hereto agree that any obligations of the Contractor arising from the Request for Qualification or Request for Proposals, as the case may be, shall be deemed to form part of this Agreement and treated as such.

27.9 Severability

If for any reason whatever, any provision of this Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties will negotiate in good faith with a view to agreeing to one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable to such invalid, illegal or unenforceable provision. Failure to agree upon any such provisions shall not be subject to the Dispute Resolution Procedure set forth under this Agreement or otherwise.

27.10 No partnership

This Agreement shall not be interpreted or construed to create an association, joint venture or partnership between the Parties, or to impose any partnership obligation or liability upon either Party, and neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

27.11 Third parties

This Agreement is intended solely for the benefit of the Parties and their respective successors and permitted assigns, and nothing in this Agreement shall be construed to

create any duty to, standard of care with reference to, or any liability to, any person not a Party to this Agreement.

27.12 Successors and assigns

This Agreement shall be binding upon, and inure to the benefit of the Parties and their respective successors and permitted assigns.

27.13 Notices

Any notice or other communication to be given by any Party to the other Party under or in connection with the matters contemplated by this Agreement shall be in writing and shall:

- (a) in the case of the Contractor, be given by facsimile or e-mail and by letter delivered by hand to the address given and marked for attention of the person set out below or to such other person as the Contractor may from time to time designate by notice to the Authority; provided that notices or other communications to be given to an address outside [Patna] may, if they are subsequently confirmed by sending a copy thereof by registered acknowledgement due, air mail or by courier, be sent by facsimile or e-mail to the person as the Contractor may from time to time designate by notice to the Authority;

[***]

- (b) in the case of the Authority, be given by facsimile or e-mail and by letter delivered by hand and be addressed to the [Chairman] of the Authority with a copy delivered to the Authority Representative or such other person as the Authority may from time to time designate by notice to the Contractor; provided that if the Contractor does not have an office in Patna it may send such notice by facsimile or e-mail and by registered acknowledgement due, air mail or by courier; and
- (c) any notice or communication by a Party to the other Party, given in accordance herewith, shall be deemed to have been delivered when in the normal course of post it ought to have been delivered and in all other cases, it shall be deemed to have been delivered on the actual date and time of delivery; provided that in the case of facsimile or e-mail it shall be deemed to have been delivered on the working day following the date of its delivery.

27.14 Language

All notices required to be given by one Party to the other Party and all other communications, Documentation and proceedings which are in any way relevant to this Agreement shall be in writing and in English language.

27.15 Counterparts

This Agreement may be executed in two counterparts, each of which, when executed and delivered, shall constitute an original of this Agreement.

27.16 Confidentiality

The Parties shall treat the details of this Agreement as private and confidential, except to the extent necessary to carry out obligations under it or to comply with Applicable Laws. The Contractor shall not publish, permit to be published, or disclose any particulars of the Works in any trade or technical paper or elsewhere without the previous agreement of the Authority.

27.17 Copyright and Intellectual Property rights

- (i) As between the Parties, the Contractor shall retain the copyright and other Intellectual Property rights in the Contractor's documents and other design documents made by (or on behalf of) the Contractor. The Contractor shall be deemed (by signing this Agreement) to give to the Authority a non-terminable transferable non-exclusive royalty-free license to copy, use and communicate the Contractor's documents, including making and using modifications of them. This license shall:
 - (a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works;
 - (b) entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works; and
 - (c) in the case of Contractor's documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by this Agreement, including replacements of any computers supplied by the Contractor.
- (ii) The Contractor's documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Authority for purposes other than those permitted under this Clause 27.17.
- (iii) As between the Parties, the Authority shall retain the copyright and other intellectual property rights in this Agreement and other documents made by (or on behalf of) the Authority. The Contractor may, at its cost, copy, use, and obtain communication of these documents for the purposes of this Agreement. They shall not, without the Authority's consent, be copied, used or communicated to a third party by the Contractor, except as necessary for the purposes of the contract.

27.18 Limitation of Liability

- (i) Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with this Agreement, save and except as provided under Articles 23 and 25.
- (ii) The total liability of one Party to the other Party under and in accordance with the provisions of this Agreement, save and except as provided in Articles 23 and 25, shall not exceed the Contract Price. For the avoidance of doubt, this Clause shall not limit the liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.

27.19 Care and Supply of Documents

- (i) Each of the Contractor's documents shall be in the custody and care of the Contractor, unless and until taken over by the Authority. Unless otherwise stated in the Agreement, the Contractor shall supply to the Authority 2 (two) copies of each of the Contractor's documents.
- (ii) The Contractor shall keep, on the Site, a copy of the Agreement, publication named in the Authority's requirements, the Contractor's documents, and variations and other communications given under the Agreement. The Authority's personnel shall have the right of access to all these documents at all reasonable times.
- (iii) If a Party becomes aware of an error or defect of a technical nature in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other party of such error or defect.

27.20 Authority's Use of Contractor's Documents

- (i) As between the Parties, the Contractor shall retain the copyright and other Intellectual Property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor.
- (ii) The Contractor hereby gives to the Authority a non-terminable transferable nonexclusive royalty-free license to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This license shall:
 - (a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works,
 - (b) entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and

- (c) in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contractor, including replacements of any computers supplied by the Contractor.
- (iii) The Contractor's Documents and other design documents made by or on behalf of the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Authority for purposes other than those permitted under this Sub-Clause.

27.21 Contractor's Use of Authority's Documents

As between the Parties, the Authority shall retain the copyright and other intellectual property rights in the Authority's requirements and other Documents made by (or on behalf of) the Authority. The Contractor may, at its cost copy, use, and obtain communication of these documents for the purpose of the Agreement. They shall not without the Authority's consent, be copied, used or communicating to a third party by the Contractor, except as necessary for the purposes of the Agreement.

27.22 Access to the Site by Others

The Contractor shall, at all times, afford access to the Site to the authorized representatives of the Authority, the Authority's Engineer and anyone else authorized by the Authority to access the site and to the persons duly authorized by any Governmental Agency having jurisdiction over the Project, including those concerned with safety, security or environmental protection to inspect the Project Highway and to investigate any matter within their authority and upon reasonable notice, the Contractor shall provide to such persons reasonable assistance necessary to carry out their respective duties and functions with minimum disruption to the construction, operation and maintenance of the Project Highway consistent with the purpose for which such persons have gained such access to the Site.

27.23 Term

This Agreement shall come into force and effect from the date first hereinabove written and shall remain in force and effect till the Termination Date i.e. the Parties perform all their respective obligations or is terminated by any of the Parties for the reasons and in the manner provided for in the Agreement.

27.24 Amendments

The Agreement may not be supplemented, amended, modified or changed except by an instrument in writing signed by the Contractor and the Authority and expressed to be a supplement, modification or change to the Agreement.

27.25 Representation and Bribes

The Contractor represents and warrants to the Authority that:

- (a) No representation or warranty by the Contractor contained herein or in any other document furnished by it to the Authority, or to any Governmental Instrumentality in relation to Applicable Permits contains or will contain any untrue statement of material fact or omits or will omit to state a material fact necessary to make such representation or warranty not misleading; and
- (b) It warrants that no sums, in cash or kind, have been paid or will be paid by or on behalf of the Contractor, to any person by way of fees, commission or otherwise for securing or entering into the Contractor for influencing or attempting to influence any officer or employee of the Authority or GOI in connection therewith.

27.26 No Agency

The Agreement does not constitute either Party as the agent, partner or legal representative of the other for any purposes whatsoever, and neither Party shall have any express or implied right or authority to assume or to create any obligation or responsibility on behalf of or in the name of the other Party.

IFB No-

Patna, Dated-.....



**BIHAR STATE ROAD DEVELOPMENT CORPORATION
LIMITED**

(A Govt. of Bihar Undertaking)

ROAD & HIGHWAY WORKS

SCHEDULES FOR

**Improvement/Upgradation, Widening and Strengthening of Mansi-
Fungo Halt Section of Mansi-Saharsa-Hardi-Claughara Road(SH-95)
from KM 0+000 to KM 14+125 (Length-14.125 KM) on EPC Mode
(Civil Works Contract Package No. BSHI-III (Phase-2)/Pkg-3/SH-95)**

VOLUME II - BID DOCUMENTS

**BIHAR STATE ROAD DEVELOPMENT CORPORATION
LIMITED**

**Bihar State Road Development Corporation Ltd.,
(A Govt. of Bihar Undertaking),
RCM Mech. Workshop Campus, Sheikhpura,**

Patna - 800 014, BIHAR

April 2022

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**Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section of Mansi-Saharsa-Hardi-Chaughara Road(SH-95) from KM 0+000 to KM 14+125 (Length- 14.125 KM) on EPC Mode
(Civil Works Contract Package No. BSHP-III (Phase-2)/Pkg-3/SH-95)**

**Schedules
(A to T)
Mansi to Fungo Halt
(Km 0+000 to Km 14+125)**

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SCHEDULE - A
(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site

- a. Site of the Single / Intermediate lane Project Highway with missing link shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.
- b. The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A.
- c. 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.
- d. The alignment plans of the Project Highways are specified in Annex-III. In the case of section where no modification in the existing alignment of the project highway is contemplated, the alignment plan has not been provided. The alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the project highways shall be followed by the Contractor with minimum FRL as indicated in the alignment plan. The Contractor shall however improve/upgrade the Road Profile as indicated in Annexure-III based on site/design requirement.
- e. The status of the environment clearances obtained or awaited is given in Annex IV.

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**Annex - I
(Schedule-A)**

Site of the Project

[Note: Through suitable drawings and description in words, the land, buildings, structures and road works comprising the site shall be specified briefly but precisely in this Annex-I. All the chainages / location referred to in Annex-I to Schedule-A shall be design chainage.]

1 Site

The Project road starts from the T-junction at km 276+200 of NH-31 at Manasi in Khagaria district and ends at Km.14.125 at Fungo Halt. The proposed road stretch is part of State Highway 95, crosses railway line at 2 locations and four major rivers viz. Bagmati, Katyani, Old Koshi and Koshi. The details of site are described below.

| Sr. No. | Type of Existing segment | Existing Chainage | | Design Chainage | | Length (Km) | Remarks |
|---------|--------------------------|-------------------|--------|-----------------|--------|-------------|--|
| | | Start | End | Start | End | | |
| 1 | Existing Road/Alignment | 0+000 | 7+270 | 0+000 | 7+270 | 7.270 | Starts from Mansi and ends at Badla Bund |
| 2 | New Alignment | 7+270 | 14+125 | 7+270 | 14+125 | 6.855 | Starts from Badla Bund and ends at Fungo Halt (Missing link) |
| | Total | | | | | 14.125 | |

2 Land

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

Project Road:-

| Sr. No. | Chainage | | Width of ROW (in meters) | Remark |
|---------|----------|--------|--------------------------|--------------------------|
| | From | To | | |
| 1 | 0+000 | 7+270 | 24 to 35 | Existing Road |
| 2 | 8+580 | 8+580 | 45 | Major Bridge (River Bed) |
| 3 | 9+600 | 9+950 | 45 | Major Bridge (River Bed) |
| 4 | 11+850 | 12+100 | 45 | Major Bridge (River Bed) |
| 5 | 13+200 | 13+850 | 45 | Major Bridge (River Bed) |

Note: The land already in possession and land to be possessed as per the requirement of TCS.

3 Carriageway

The existing road of the Project stretch is Single / Intermediate lanes. The type of the existing pavement is flexible.

| S. No | Location | Description of Strata | | Total Thickness (mm) |
|-------|----------|-----------------------|-----------|----------------------|
| | | Composition | Thickness | |
| | | Bituminous Layer | 25 | |

| | | | | |
|---|-------------------|--------------|-----|-----|
| 1 | 5+000 Km (L/S) | WBM | 150 | 345 |
| | | Brick Bats | 170 | |
| 2 | 6+200 Km (R/S) | PCC | 200 | 410 |
| | | WBM | 140 | |
| | | Brick Soling | 70 | |

4 Major Bridges

The project site includes following Major Bridges:

| Sr. No. | Chainage | Type of Structure | | | No. of spans with span length (m) | Width (m) |
|---------|----------|-------------------|-------------------|---------------------|---|-----------|
| | | Foundation | Sub- structure | Super- structure | | |
| Nil | | | | | | |

5 Road Over-Bridges (ROB)/ Road Under-Bridges (RUB)

The site includes the following ROB (Road Over Bridge)/RUB (Road under Bridge).

| Sr. No. | Chainage | Type of Structure | | No. of spans with span length (m) | Width (m) | ROB/ RUB |
|---------|----------|-------------------|---------------------|---|-----------|-------------|
| | | Foundation | Super- structure | | | |
| Nil | | | | | | |

6 Grade Separators (VUP/Flyover)

The Site includes the following grade separators:

| Sr. No. | Chainage | Type of Structure | | No. of spans with span length (m) | Width (m) |
|---------|----------|-------------------|---------------------|---|-----------|
| | | Foundation | Super- structure | | |
| Nil | | | | | |

7 Minor Bridges

The Site includes the following minor bridges:

| Sr. No. | Existing Chainage (km) | Type of Structure | | | No. of Spans x Span Length (m) | Over all Width (m) |
|---------|------------------------|-------------------|-------------------|--------------------|-----------------------------------|--------------------|
| | | Foundation | Sub- Structure | Super Structure | | |
| 1. | 2+348 | - | - | RCC T Beam | 4 x 3.60 | 5.00 |
| 2. | 3+302 | - | - | RCC T Beam | 3 x 4.10 | 8.30 |
| 3. | 4+063 | - | - | - | 3 x 6.50 | 12.00 |
| 4. | 4+845 | - | - | - | 5 x 6.50 | 12.00 |

8 Railway Level Crossings

The Site includes following railway level crossings.

| Sr. No. | Location (km) | Remark |
|---------|----------------------|--------------|
| 1 | 0+185 (Mansi) | Single Track |
| 2 | 7+807 (Missing Link) | - |

9 Underpasses/Overpasses (Vehicular, Non Vehicular)

The site includes the following underpasses/overpasses:

| Sr. No. | Chainage (Km.) | Type of Structure | No. of spans with span length (m) | Width (m) |
|---------|----------------|-------------------|-----------------------------------|-----------|
| Nil | | | | |

10 Culverts

The Site has the following culverts:

| Sr. No. | Chainage (Km.) | Type of Culvert (Pipe, Slab, Box, Arch) | Span / opening with span length / pipe dia (m) | Overall Width (m) |
|---------|----------------|---|--|-------------------|
| 1. | 0+242 | Pipe Culvert | 1 × 0.90 | - |
| 2. | 3+779 | Pipe Culvert | 2 × 0.90 | 9.40 |
| 3. | 5+050 | Pipe Culvert | 4 × 0.60 | - |
| 4. | 6+600 | Pipe Culvert | 4 × 0.60 | - |

11 Bus Bays / Bus Shelter

The details of bus bays on the site are as follows:

| Sl. No | Chainage (km) | Length (m) | Left Hand Side | Right Hand Side |
|--------|---------------|------------|----------------|-----------------|
| Nil | | | | |

12 Truck Lay Bys

The details of truck lay byes on the site are as follows:

| No | Chainage (km) | Length (m) | Left Hand Side | Right Hand Side |
|-----|---------------|------------|----------------|-----------------|
| Nil | | | | |

13 Road Side Drains

The details of the roadside drains are as follows:

| Sl. No. | Location | | Length (km) | Side | Type | |
|---------|----------|--------|--------------|------|--------------------|-------------------|
| | From Km. | To Km. | | | Masonry/CC (Pucca) | Earthen (Kutchha) |
| 1 | 0+580 | 0+600 | 0.02 | LHS | Masonry | |
| 2 | 0+980 | 1+060 | 0.08 | LHS | Masonry | |
| Total | | | 100 m | | | |

14 Major Junctions

The details of major junctions are as follows:

| Sl. No | Existing Chainage (Location) | Type of Junction (+,T,Y) | At-Grade | Separated | Category of Cross Road | | | |
|--------|-------------------------------------|--------------------------|----------|-----------|------------------------|----|-----|--------|
| | | | | | NH | SH | MDR | Others |
| 1 | 0+000 KHAGARIA PURNIA (Mansi) | T | At-Grade | | NH-31 | | | |
| 2 | 0+780 MANSI MAIN CHOWK | + | At-Grade | | | | | ODR |

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

15 Minor Junctions

The details of minor junctions are as follows:

| Sl. No | Existing Chainage | Type of Junction (+,T,Y) | Cross-Road |
|--------|-------------------|--------------------------|---------------------|
| 1 | 0+050 | T | MANSI VILLAGE |
| 2 | 0+200 | T | MANSI VILLAGE |
| 3 | 0+250 | T | MANSI VILLAGE |
| 4 | 0+350 | T | MANSI VILLAGE |
| 5 | 0+400 | T | MANSI VILLAGE |
| 6 | 0+500 | T | MANSI VILLAGE |
| 7 | 0+500 | T | MANSI VILLAGE |
| 8 | 0+600 | T | MANSI VILLAGE |
| 9 | 1+000 | T | MANSI VILLAGE |
| | 1+150 | T | MANSI VILLAGE |
| 11 | 3+350 | T | TOWARDS YADAV CHOWK |
| 12 | 5+040 | T | JHAMTA VILLAGE |
| 13 | 5+200 | Y | JHAMTA VILLAGE |

| | | | |
|----|-------|---|----------------|
| 14 | 5+250 | T | JHAMTA VILLAGE |
| 15 | 5+270 | T | JHAMTA VILLAGE |
| 16 | 5+340 | T | JHAMTA VILLAGE |
| 17 | 6+030 | T | BALAHA VILLAGE |
| 18 | 6+160 | T | BALAHA VILLAGE |
| 19 | 7+400 | Y | BALAHA VILLAGE |

16 Bypasses

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

| Sl. No. | Name of bypass (town) | Chainage (km) From km to km | Length (in Km) |
|---------|-----------------------|-----------------------------|----------------|
| Nil | | | |

17 Service / Slip Road

The details of the slip/service roads are as follows:

| S.N. | LHS | | | RHS | | |
|------|----------|----|------------------|----------|----|------------------|
| | Chainage | | | Chainage | | |
| | from | to | length in meters | from | to | length in meters |
| Nil | | | | | | |

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Annex – II
(As per clause 8.3(i))
(Schedule-A)

Dates for providing Right of Way of Construction Zone

The dates on which the Authority shall provide Right of Way of Construction Zone to the Contractor on different stretches of the Site are stated below. The widening shall be accommodated within the available ROW except at locations of Junction Improvements, Re-alignment sections, ROB location, Missing links, Trucklay byes, Toll Plaza/Rest areas for which land shall be acquired within 240 days from the appointed date, as detailed in following tables.

(i) Full Right of Way (full width)

(ROW details for Rural Area Locations)

| Sl. No. | Chainage | | Length | Available ROW (m) | Dates of Providing Right of Way |
|---------|----------|--------|--------|-------------------|--|
| | From | To | | | |
| 1 | 0+000 | 0+400 | 0.400 | 24 to 35 | Available at the time of handing over the site to the Contractor |
| 2 | 1+600 | 4+270 | 2.670 | 24 to 35 | |
| 3 | 4+270 | 4+920 | 0.650 | 24 to 35 | |
| 4 | 4+920 | 5+670 | 0.750 | 24 to 35 | |
| 5 | 5+670 | 5+970 | 0.300 | 24 to 35 | |
| 6 | 6+370 | 7+020 | 0.650 | 24 to 35 | |
| 7 | 7+020 | 7+095 | 0.075 | 24 to 35 | |
| 8 | 7+095 | 7+270 | 0.175 | 24 to 35 | |
| 9 | 8+580 | 8+980 | 0.400 | 45 | |
| 10 | 9+600 | 9+950 | 0.350 | 45 | |
| 11 | 11+850 | 12+100 | 0.250 | 45 | |
| 12 | 13+280 | 13+850 | 0.570 | 45 | |

(ii) Full Right of Way

(ROW details for Urban Area Locations)

| Sl. No. | Chainage | | Length | Available ROW (m) | Dates of Providing Right of Way |
|---------|----------|-------|--------|-------------------|--|
| | From | To | | | |
| 1 | 0+400 | 1+600 | 1.200 | 24 to 35 | Available at the time of handing over the site to the Contractor |
| 2 | 5+970 | 6+370 | 0.400 | 24 to 35 | |

(iii) Balance Right of Way (Width)

(ROW details for ROB Locations)

| Sl. No. | Design Chainage | | Design Length | Proposed ROW | Dates of Providing Right of Way |
|---------|-----------------|-------|---------------|--------------|----------------------------------|
| | From | To | | | |
| 1 | 7+420 | 8+220 | 0.800 | 45 | 240 days from the Appointed date |

(ROW details for Missing Links Locations)

| Sl. No. | Design Chainage | | Design Length | Proposed ROW (m) | Dates of Providing Right of Way |
|---------|-----------------|--------|---------------|------------------|----------------------------------|
| | From | To | | | |
| 1 | 7+270 | 8+580 | 1.31 | 45 | 240 days from the Appointed date |
| 2 | 8+980 | 9+600 | 0.62 | 45 | |
| 3 | 9+950 | 11+850 | 1.90 | 45 | |
| 4 | 12+100 | 13+280 | 1.18 | 45 | |
| 5 | 13+850 | 14+125 | 0.275 | 45 | |

Annex - III

(Schedule-A)

Alignment Plans

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

- (i) The alignment of the Project Highway is enclosed in the alignment plan (Appendix B1-Drawings). Finished road level indicated in the alignment plan/Plan and Profile shall be followed by the contractor as minimum FRL. In any case, the finished road level of the project highway shall not be less than those indicated in alignment plan. The Contractor shall however, improve/ upgrade the Road profile as indicated in Annex-III based on site/ design requirement.

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Annex – IV

(Schedule-A)

Environment Clearances

- As per notification no. S.O.2559 dt. 22.08.2013 of Ministry of Environment and forests, expansion of National Highway projects upto 100 Kms involving additional right of way or land acquisition upto 40 meter on existing alignments and 60 meter on re-alignment or by-passes may be exempted from the preview of the notification. Hence Environment clearance is not required for this project as project road length is less than 100 Km.

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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**. The alignment plans of the Project Highway are specified in **Annex-III of Schedule A**. The proposed profile of the Project road shall be followed by the Contractor with minimum FRL as indicated in the alignment plan. The Contractor however, improve/upgrade the Road Profile as indicated in **Annex-III of Schedule A** based on site/design requirement.

2. Rehabilitation and augmentation

Improvement, Up-gradation, Widening and Strengthening of the road shall include Two-Lane with Paved Shoulder and widening/ reconstruction/new construction of the Project Highway with ROB and Major Bridges as described in **Annex-I of this Schedule-B and Schedule C**.

3. 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** with minimum provisions given in Schedule B and Schedule C w.r.t the crust thickness.

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Annex - I
(Schedule-B)

Description of Two Laning with Paved Shoulder

1 NEW CONSTRUCTION / IMPROVEMENT, UPGRADATION, WIDENING & STRENGTHENING OF EXISTING HIGHWAY WITH ROB AND MAJOR BRIDGES.

1.1 The Project road starts at Ch. 0+000 (Mansi) and ends at Ch. 14+125 (Fungo Halt) and design length of project road is 14.125 km. The project highway shall be constructed as per Schedule B, C and D. The project Highway shall follow the existing alignment 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 proposed horizontal and vertical profiles shall be corrected as per the prescribed standards for plain terrain to the extent land is available.

1.2 Width of Carriageway

1.2.1 Two-Laning with paved shoulders shall be undertaken. The paved carriageway shall be 10 m wide in accordance with the typical cross section drawings provided in the Schedules.

Provided that in the built-up areas the width of the carriageway shall be as specified in the following table:

| Sl. No. | Built-up Stretch (Township) | Location (km) | | Length (Km) | Typical Cross Section |
|--------------|-----------------------------|---------------|-------|---------------|---|
| | | From | To | | |
| 1 | Mansi Village | 0+400 | 1+600 | 1+200 | As per Typical Cross-Section of Schedule indicated in Appendix B-I (TCS-3). |
| 2 | Balaha Village | 5+970 | 6+370 | 0+400 | |
| Total | | | | 1.60km | |

1.2.2 Except as otherwise provided in this Agreement, the width of the paved carriageway and cross sectional features shall conform to Manual.

2 GEOMETRIC DESIGN AND GENERAL FEATURES

2.1 General

Geometric design and general features of the Project Highway including structures, ROB, approaches, slip road & major/minor junction improvement shall be in accordance with the Alignment Plan provided by the Authority and in conformity with Section 2 of the Manual IRC SP: 73-2018 for 2 lanes.

2.2 Design Speed

The design speed shall be the minimum design speed of 80 km/hr for plain terrain except in the stretch specified below:

| Sl. No. | Design Chainage (km) | | Design Length (m) | Design speed | Remarks |
|---------|----------------------|-------|-------------------|--------------|--------------------------|
| | From | To | | | |
| 1 | 0+000 | 0+100 | 100 | 50 | Mansi Village/Urban Area |
| 2 | 0+100 | 0+700 | 100 | 30 | |

2.3 **Improvement of the proposed road geometrics**

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

2.4 **Right of Way**

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

2.5 **Type of Shoulders**

- (a) In built-up sections, footpath/fully paved shoulder shall be provided in the following section:

| Sl. No. | Stretch | | Fully Pavement Quality Concrete/Footpaths | Reference to cross section |
|---------|---------|-------|---|---|
| | From | To | | |
| 1 | 0+400 | 1+600 | Paver Block & Drain-cum-Footpath | Cross-sections attached with the schedule indicated in Appendix B-I will be referred |
| 2 | 5+970 | 6+370 | Paver Block & Drain-cum-Footpath | |

- (b) In open country, earthen shoulder of 1.0 m width shall be provided with 150mm thick compacted layer of granular material.
- (c) Design and specification of paved shoulders and granular material shall conform to the requirement specified in the Section 5 of Manual IRC SP: 73-2018.
- (d) Paver Blocks shall be provided in stretch as per TCS & Designed in conforming to the Manual IRC SP: 63-2004.

2.6 **Lateral and vertical clearances at underpasses**

Lateral and vertical clearances at underpasses and provisions of guard rail/crash barriers shall be as per provisions of relevant manual and General Arrangement Drawings (GAD) given at **Appendix B1** of this schedule.

- 2.6.1 Lateral clearance: The width of the minimum opening at the underpasses shall be as follows:

| Sl. No. | Design Chainage | Span/opening (m) | Remarks |
|---------|-----------------|------------------|---------|
| Nil | | | |

2.7 **Lateral and vertical clearances at overpasses**

- 2.7.1 Lateral and vertical clearances at overpasses shall be as per provision of relevant Manual.

- 2.7.2 Lateral clearance: The width of the opening at the overpasses shall be as follows:

| Sl. No. | Design Chainage | Span/opening (m) | Remarks |
|---------|-----------------|------------------|---------|
| Nil | | | |

2.8 **Bypass**

The bypass shall be constructed and for the length indicated below:

| Sl. No. | Design Chainage (km) | | Design Length (km) | Remarks |
|---------|----------------------|----|--------------------|---------|
| | From | To | | |
| Nil | | | | |

2.9 **Service/Slip Roads**

The service/slip roads of 5.5 m carriageway width shall be constructed at the following locations and for the length indicated below.

| Sl. No. | Location of Service Road | | Length (km) of service road | Remark |
|---------------------|--------------------------|--------|-----------------------------|--------------------------------------|
| | From Km | To km | | |
| 1 | 10+120 | 10+450 | 0.330 | Service road of 2 Lane LVUP location |
| Total Length | | | 0.330 | Both sides 0.660 km |

2.10 **Light Vehicular Underpasses**

2.10.1 Light Vehicular Underpasses shall be provided as follows.

| Sl. No. | Design Chainage | Span/opening (m) | Remarks |
|---------|-----------------|------------------|-------------|
| 1 | 10+120 | 1 x 7 x 4.5 | 2 Lane LVUP |
| 2 | 11+015 | 1 x 7 x 4.5 | 2 Lane LVUP |
| 3 | 11+650 | 1 x 7 x 4.5 | 2 Lane LVUP |
| 4 | 12+368 | 1 x 7 x 4.5 | 2 Lane LVUP |
| 5 | 13+020 | 1 x 7 x 4.5 | 2 Lane LVUP |

2.11 **Grade Separated Structures**

2.11.1 Grade separated structures shall be provided as follows:

| Sl. No. | Location (Chainage) | | Span/opening (m) | Remarks |
|---------|---------------------|---------|------------------|-------------|
| | From (km) | To (km) | | |
| 1 | 10+120 | 10+450 | 1x7x4.5 | 2 Lane LVUP |

Note: Location of Grade Separated Structures may be changed as per the site requirement and will be finalized in consultation with the Authority Engineer/Authority.

2.11.2 In the case of grade separated structures, the type of structure and the level of the Project Highway and the cross roads shall be as per General Arrangement Drawing and the Plan and Profile Drawings attached.

2.12 **Cattle and pedestrian underpass /overpass**

Cattle and pedestrian underpass/ overpass shall be constructed as follows

| Sl. No. | Design Chainage | Type of crossing |
|---------|-----------------|------------------|
| Nil | | |

2.13 **Typical cross-sections of the Project Highway**

The typical cross-sections of the Project Highway are given in **Appendix B-1 (Volume-III Drawings)** of this schedule. The chainage wise applicable typical cross section is provided in table below:

| Sl. No. | Chainage | | Length (km) | TCS Type | Remark |
|---------|----------|--------|-------------|----------|-------------------------------|
| | From Km | To km | | | |
| 1 | 0+000 | 0+400 | 0.400 | 1 | As per Typical Cross Sections |
| 2 | 0+400 | 1+600 | 1.200 | 3 | As per Typical Cross Sections |
| 3 | 1+600 | 4+270 | 2.670 | 1 | As per Typical Cross Sections |
| 4 | 4+270 | 4+920 | 0.650 | 2 | As per Typical Cross Sections |
| 5 | 4+920 | 5+670 | 0.750 | 1 | As per Typical Cross Sections |
| 6 | 5+670 | 5+970 | 0.300 | 2 | As per Typical Cross Sections |
| 7 | 5+970 | 6+370 | 0.400 | 3 | As per Typical Cross Sections |
| 8 | 6+370 | 7+020 | 0.650 | 1 | As per Typical Cross Sections |
| 9 | 7+020 | 7+095 | 0.075 | 2 | As per Typical Cross Sections |
| 10 | 7+095 | 7+270 | 0.175 | 1 | As per Typical Cross Sections |
| 11 | 7+270 | 8+350 | 1.080 | 7 | As per Typical Cross Sections |
| 12 | 8+350 | 8+625 | 0.275 | 4 | As per Typical Cross Sections |
| 13 | 8+625 | 8+970 | 0.345 | 8 | As per Typical Cross Sections |
| 14 | 8+970 | 9+610 | 0.640 | 4 | As per Typical Cross Sections |
| 15 | 9+610 | 9+910 | 0.300 | 8 | As per Typical Cross Sections |
| 16 | 9+910 | 10+120 | 0.210 | 4 | As per Typical Cross Sections |
| 17 | 10+120 | 10+450 | 0.330 | 5 | As per Typical Cross Sections |
| 18 | 10+450 | 10+800 | 0.350 | 4 | As per Typical Cross Sections |
| 19 | 10+800 | 11+200 | 0.400 | 6 | As per Typical Cross Sections |
| 20 | 11+200 | 11+450 | 0.250 | 4 | As per Typical Cross Sections |
| 21 | 11+450 | 11+852 | 0.402 | 6 | As per Typical Cross Sections |
| 22 | 11+852 | 12+080 | 0.228 | 8 | As per Typical Cross Sections |

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| | | | | | |
|----|--------|--------|-------|---|-------------------------------|
| 23 | 12+080 | 12+200 | 0.120 | 4 | As per Typical Cross Sections |
| 24 | 12+200 | 12+600 | 0.400 | 6 | As per Typical Cross Sections |
| 25 | 12+600 | 12+800 | 0.200 | 4 | As per Typical Cross Sections |
| 26 | 12+800 | 13+220 | 0.420 | 6 | As per Typical Cross Sections |
| 27 | 13+220 | 13+295 | 0.075 | 4 | As per Typical Cross Sections |
| 28 | 13+295 | 13+805 | 0.510 | 8 | As per Typical Cross Sections |
| 29 | 13+805 | 14+125 | 0.320 | 4 | As per Typical Cross Sections |

3 INTERSECTIONS AND GRADE SEPARATORS

All intersections and grade separators shall be as per the provision of relevant Manual. Existing intersections which are deficient shall be improved to the prescribed standards.

Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

(a) At-grade intersections

- i) **Major Intersection:** The following major intersection needs to be improved as per manual.

| Sl. No | Location of Intersection | Type of Intersection | Other features | Remarks |
|--------|--------------------------|----------------------|----------------|---|
| 1 | 0+000 | Three Leg | Major | Upgraded as per manual /Within Available ROW & As per Site Conditions |
| 2 | 0+600 | Three Leg | Major | |
| 3 | 0+755 | Four Leg | Major | |
| 4 | 3+355 | Three Leg | Major | |
| 5 | 6+160 | Three Leg | Major | |
| 6 | 7+270 | Three Leg | Major | |
| 7 | 14+125 | Three Leg | Major | |

- ii) **Minor Intersection:** The following minor intersection needs to be improved as per manual.

| Sl. No | Location of Intersection | Type of Intersection | Other features | Remark |
|--------|--------------------------|----------------------|----------------|---|
| 1 | 0+350 | Three Leg | Minor | Upgraded as per manual /Within Available ROW & As per Site Conditions |
| 2 | 1+070 | Three Leg | Minor | |
| 3 | 1+160 | Three Leg | Minor | |
| 4 | 1+220 | Three Leg | Minor | |
| 5 | 1+310 | Three Leg | Minor | |
| 6 | 1+370 | Three Leg | Minor | |
| 7 | 1+440 | Three Leg | Minor | |
| 8 | 1+490 | Three Leg | Minor | |
| 9 | 2+045 | Three Leg | Minor | |
| 10 | 5+025 | Three Leg | Minor | |
| 11 | 5+200 | Three Leg | Minor | |
| 12 | 5+230 | Three Leg | Minor | |
| 13 | 5+270 | Three Leg | Minor | |
| 14 | 5+320 | Three Leg | Minor | |
| 15 | 6+018 | Three Leg | Minor | |
| 16 | 6+295 | Three Leg | Minor | |
| 17 | 6+850 | Three Leg | Minor | |
| 18 | 10+120 | Two Leg (LVUP) | Minor | |
| 19 | 11+015 | Two Leg (LVUP) | Minor | |
| 20 | 11+650 | Two Leg (LVUP) | Minor | |
| 21 | 12+368 | Two Leg (LVUP) | Minor | |
| 22 | 13+020 | Two Leg (LVUP) | Minor | |

- (b) **Grade separated intersection with ramp**

| Sr. No. | Design Chainage | Salient features | Minimum length of viaduct to be provided | Road to be carried over/ under the structures |
|---------|-----------------|------------------|--|---|
| Nil | | | | |

- (c) **Grade separated intersection without ramps**

| Sr. No. | Design Chainage | Salient features | Minimum length of viaduct to be provided | Road to be carried over/ under the structures |
|---------|-----------------|------------------|--|---|
| Nil | | | | |

4 ROAD EMBANKMENT AND CUT SECTION

Improvement, Up-gradation, Widening and Strengthening of the existing road Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95) in the State of Bihar on EPC Mode

embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Manual and the specified cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

Rising of the existing road shall be as per paragraph 4.2.1 of the Manual.

5 PAVEMENT DESIGN

5.1 Pavement design shall be carried out in accordance with Section 5 of the Manual. However minimum thickness and composition of pavement has been shown in typical cross section.

5.2 Type of pavement

Type of Pavement shall be Flexible Pavement at all locations except in urban/habitation area where Rigid pavement is to be provided.

5.3 Design requirements

5.3.1 Design Period and strategy

Rigid pavement shall be designed for a minimum design period of 30 years as per IRC 58: 2015. Stage construction shall not be permitted.

Flexible Pavement shall be designed for a minimum period of 20 years as per IRC 37: 2019. Stage construction shall not be permitted.

5.3.2 Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for a design traffic of minimum 20 million standard axles (MSA) or as per the actual traffic whichever is higher for main carriageway and service/slip road. The minimum crust to be followed shall be as follows.

Minimum Pavement Thickness - Main Carriageway (at all widening/new pavement location)

| Sr. No. | Description | Minimum crust composition of Flexible Pavement |
|---------|--------------|--|
| 1. | BC | 40 mm |
| 2. | DBM | 95 mm |
| 3. | WMM | 250 mm |
| 4. | GSB | 230 mm |
| | Total | 615 mm |

Minimum Pavement Thickness – Main Carriageway (at all urban/habitation locations)

| Sr. No. | Description | Minimum crust composition of Rigid Pavement |
|---------|--------------|---|
| 1. | PQC | 300 mm |
| 2. | DLC | 150 mm |
| 3. | GSB | 150 mm |
| | Total | 600 mm |

Note: 1 :- Excavating and removal of entire loose/garbage/ filled up/ Marshy/mud/soft shale/ peat/unconsolidated soil (to a minimum depth of 300mm or as required as per site condition) in entire width & disposed off beyond inhabitant area. Its disposal shall be the responsibility of

the Contractor for all leads and lift. Excavated earth to be replaced and filled up to subgrade level with Embankment quality earth having minimum CBR of 6.

Note: 2 :- Existing Flexible / Concrete Pavement is to be dismantled and scarified to a depth of suitable strata as decided in consultation with Authority Engineer and its safe disposal beyond inhabitant area. Its disposal shall be the responsibility of the Contractor for all leads and lift.

6 ROADSIDE DRAINAGE

Drain cum Footpath shall be constructed on both sides of the project Highway throughout as per the typical cross sections attached and as per provision of relevant Manual. Roadside drain of RCC Box type capable of bearing load for service road / road connecting to project road shall also be provided in the stretches as shown in the typical cross sections. Best engineering practices shall be observed during excavation and construction of drain along ROW line which co-exists with buildup structure.

7 DESIGN OF STRUCTURES

7.1 General

- 7.1.1 All bridges, culverts and structures shall be designed and constructed in accordance with provision of relevant Manual latest IRC and MORTH standards prevalent, conforming to applicable earth quake zone & shall conform to the cross-sectional features and other details specified therein. The EPC Contractor shall get relevant approval of all bridges including ROB, GADs and detailed from the concerned Department.
- 7.1.2 Width of the carriageway of new bridges and structures shall be as follows and in accordance with the General Arrangement Drawings / Typical Cross Sections given at Appendix-B1 of this schedule:

| Sl. No. | Bridge at km | Width of carriageway and cross section features |
|---------|--------------|---|
| 1 | 2+348 | 18m as per Manual |
| 2 | 3+303 | 18m as per Manual |
| 3 | 4+063 | (Recently New constructed to be retained) |
| 4 | 4+845 | (Recently New constructed to be retained) |
| 5 | 8+798 | 18m as per Manual |
| 6 | 9+765 | 18m as per Manual |
| 7 | 11+178 | 18m as per Manual |
| 8 | 11+967 | 18m as per Manual |
| 9 | 13+551 | 18m as per Manual |

Note: - Span arrangement of bridges and structures shall be designed by Contractor on the basis of detailed surveys & investigations subject to minimum specified in GAD as per **Appendix B1** of this schedule. Founding levels shall be decided after detailed Geo Technical Investigation. Water way, road top level, soffit etc. shall be decided on the basis of land survey conforming to various codal provision applicable.

7.1.3 The following structures shall be provided with footpaths –

| Sl. No. | Location at Km. | Remarks |
|---------|-----------------|-----------------------------|
| 1 | 2+348 | Reconstruction Minor Bridge |
| 2 | 3+303 | Reconstruction Minor Bridge |
| 3 | 7+807 | New ROB Bridge |
| 4 | 8+798 | New Major Bridge |
| 5 | 9+765 | New Major Bridge |
| 6 | 11+176 | New Minor Bridge |
| 7 | 11+967 | New Major Bridge |
| 8 | 13+551 | New Major Bridge |

7.1.4 All bridges shall be high-level bridges.

7.1.5 Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the General Arrangement Drawings given at Appendix B1 of this schedule, Typical Cross Sections given in the Manual and deviations given at Schedule D.

7.2 Culverts

7.2.1 Overall width of all culverts shall be equal to the roadway width of the approach.

7.2.2 Reconstruction of existing Culverts

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

| Sl. No. | Design Ch. | Culverts | Recommendation | Existing Span | Proposed span (m) |
|---------|------------|----------|----------------|---------------|-------------------|
| 1 | 0+242 | HP | Reconstruction | 1*0.90 | 1x1.2 |
| 2 | 3+779 | HP | Reconstruction | 2*0.90 | 2x1.2 |
| 3 | 5+050 | HP | Reconstruction | 4*0.60 | 2x1.2 |
| 4 | 6+600 | HP | Reconstruction | 4*0.60 | 2x1.2 |

7.2.3 Widening of existing culverts:

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the Project as per typical cross section given in the provision of relevant manual. Repairs and strengthening of existing structure where required shall be carried out.

| Sl. No. | Design Ch. | Culverts | Recommendation | Existing Span | Proposed span (m) |
|---------|------------|----------|----------------|---------------|-------------------|
| Nil | | | | | |

7.2.4 New Box Culverts shall be constructed as per particulars given in the table below:-

| Sl. No. | Proposed Design Chainage | Proposed Span Arrangement (size) | Clear Width a (mm) | Clear Ht. b(mm) | Top Slab c (mm) | Bottom Slab d (mm) | Wall e (mm) | Proposed Structure Type | Remark |
|---------|--------------------------|----------------------------------|--------------------|-----------------|-----------------|--------------------|-------------|-------------------------|------------------|
| 1 | 0+050 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 2 | 1+700 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 3 | 2+000 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 4 | 2+810 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 5 | 4+450 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 6 | 5+940 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 7 | 6+100 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 8 | 7+040 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 9 | 8+400 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 10 | 9+300 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 11 | 10+370 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 12 | 10+665 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 13 | 11+600 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 14 | 12+300 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 15 | 12+630 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 16 | 12+871 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 17 | 13+120 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |
| 18 | 14+000 | 1x2 | 2000 | 2000 | 200 | 250 | 200 | Rcc Box | New Construction |

Note: These locations of culverts are tentative, exact number & location may be finalized in consultation with Authority Engineer/ Authority.

7.2.5 Repairs/replacements of railing/parapet, flooring and protection works of the existing culverts shall be undertaken as follows:

| Sl. No. | Proposed Design Chainage | Type of Structure (Pipe, Slab, Box, Arch) | Span Arrangement and Total Vent way (No. x Length) (m) | Existing Width of structure | Type of repair required |
|---------|--------------------------|---|--|-----------------------------|-------------------------|
| Nil | | | | | |

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

7.3 Bridges

7.3.1 The existing bridges at the following locations shall be re-constructed as new structures as per the provisions of relevant Manual:

| Sl. No. | Bridge Location (km) | Salient details of existing bridge | Adequacy or otherwise of the existing waterway, vertical clearance, etc | Remarks |
|---------|----------------------|------------------------------------|---|---|
| 1 | 2+348 | - | 1x20.00 | As per GADs indicated in Appendix B-I. |
| 2 | 3+302 | 3 x 4.0m | 1x20.00 | |

7.3.2 The existing bridges at the following locations shall be widened as per the provisions of relevant Manual

| Sl. No. | Location (km) | Existing width (m) | Extent of widening (m) | Cross section at deck level for widening @ |
|---------|---------------|--------------------|------------------------|--|
| NIL | | | | |

7.3.3 Additional New Bridges:

New bridges at the following locations on the Project Highway shall be constructed. General Arrangement Drawings for the new bridges are given at **Appendix B1** of this schedule.

| Sr. No | Design Chainage (km) | Existing Type | Proposed Type | Existing span arrangement (m) | Proposed Minimum Length & Proposed Minimum span arrangement (m) | Proposed minimum width (m) | Remark |
|--------|----------------------|---------------|---------------|-------------------------------|---|----------------------------|--------------|
| 1 | 8+798 | - | PSC Box | - | 242.3 (7 x 48.9) | 18 | Major Bridge |
| 2 | 9+765 | - | PSC Box | - | 293.4 (6 x 48.9) | 18 | Major Bridge |
| 3 | 11+176 | - | Solid Slab | - | 12 (1 x 12) | 18 | Minor Bridge |
| 4 | 11+967 | - | PSC Box | - | 228.2 (7 x 32.6) | 18 | Major Bridge |
| 5 | 13+551 | - | PSC Box | - | 512 (8 x 64) | 18 | Major Bridge |

- Note : 1)** Where the Existing structures reconstructed as New Bridge at same place, dismantling of Existing Major / Minor Bridge / Pipe culvert and box culvert shall be carried out with all lead and lifts. Temporary diversion works shall be constructed as per Fig. 9.25 of manual IRC SP 73-2018 and as per para 112 of standards and specifications of Indian Roads Congress (MORTH) Fifth Revision-2018 with adequate cross drainage structure and traffic safety and control devices. The diversions shall be maintained in satisfactory condition till such time they are required and as directed by the Authority Engineer and necessary bridge load test be conducted after successful completion of bridge.
- 2)** Length of the bridge / Span arrangement of Major and Minor Bridge are indicative. It shall be designed by contractor on the basis of detailed surveys & investigations subject to minimum specified in General Arrangement Drawings at **Appendix B1** of this schedule.

- 3) Bridges locations are tentative, final locations to be decided as per site conditions/ requirement and in consultation with Authority /Authority Engineer.

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

| Sl. No. | Location at km | Remarks |
|---------|----------------|--|
| 1 | 4+063 | Railings of existing bridges shall be replaced by RCC crash barriers |
| 2 | 4+845 | Railings of existing bridges shall be replaced by RCC crash barriers |

7.3.5 Repairs/replacements of railing/parapets of the existing bridges shall be undertaken as follows:

| Sl. No. | Location at km | Remarks |
|---------|----------------|---------|
| Nil | | |

7.3.6 Drainage system for bridge decks

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

7.4 **Rail-road bridges**

7.4.1 Design, construction and detailing of ROB/RUB shall be as specified in relevant Manual.

7.4.2 Road over-bridges (road over rail)

Road over-bridges (road over rail) shall be provided at the following level crossings, as per GAD, being approved by Railway Authorities, Plan & Profile and TCS given at Appendix B1 of this schedule.

| Sl. No. | Location of Level crossing (chainage km) | Proposed Minimum Length & Proposed Minimum span arrangement (m) | Proposed Type |
|---------|--|---|----------------|
| 1. | 7+807 | 176.844 (51.4+76.044+51.4) | 3 X Bow String |

- Note :**
- 1) Where the new structures to be constructed, a temporary diversion works shall be constructed as per relevant manual and MORTH specification with adequate cross drainage structure and traffic safety and control devices. The diversions shall be maintained in satisfactory condition till such time they are required and as directed by the Authority Engineer.
 - 2) Length of the road over bridge / span arrangement are indicative. It shall be designed by contractor on the basis of detailed surveys & investigations subject to minimum specified in General Arrangement Drawings at Appendix B1 of this schedule.
 - 3) No structure (Foundation & substructure) shall be constructed in the property line of Railway.

7.4.3 Road under-bridges

Road under-bridges (road under railway line) shall be provided at the following level crossings, as per GAD, Plan & Profile and TCS attached and relevant Manual.

| Sl. No. | Location of Level crossing (chainage km) | Length of bridge (m) |
|---------|--|----------------------|
| Nil | | |

7.5 Repairs and strengthening of bridges and structures

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

(i) Bridges

| Sl. No. | Location of bridge (km) | Nature and extent of repairs /strengthening to be carried out |
|---------|-------------------------|---|
| 1 | 4+063 | Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority. |
| 2 | 4+845 | Expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority. |

(ii) ROB/RUB

| Sl. No. | Location of bridge (km) | Nature and extent of repairs /strengthening to be carried out |
|---------|-------------------------|---|
| NIL | | |

(iii) Overpass/underpass and other structure

| Sl. No. | Location of bridge (km) | Nature and extent of repairs /strengthening to be carried out |
|---------|-------------------------|---|
| NIL | | |

Note: -It is clarified that above repairing & strengthening measures are indicative and minimum specified. The condition survey of the existing structure shall be carried out by the contractor as per IRC 35, & Strengthening / repairing shall be carried out as per the requirement of site and as per instruction of Authority Engineer, for pier, abutment sub structure & super structure, replacement of bearings, expansion joints & wearing coat, providing railing on bridge, painting & protection works etc. If any Increase in the specified above shall not constitute a change of scope.

7.6 Grade separated structures – Nil.

8 TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

- 8.1 Traffic control devices and road safety works shall be provided in accordance with Section 9 of the Manual of rectification.
- 8.2 Specifications of the reflective sheeting shall be provided in accordance with the Manual.
- 8.3 The minimum number of blinker signals and minimum length of various types of crash barriers are given below:

| Sl. No. | Description | Length/numbers |
|---------|--------------------------|----------------|
| 1 | New jersey crash barrier | Nil |
| 2 | W beam crash barrier | 16500 m |
| 3 | Blinker Signals | 2 Nos |
| 4 | Road Stud / Cat Eye | 1629 nos |
| 5 | Solar Studs | 240 nos. |

Note: Location and number/length of crash barriers shall be finalized in consultation with Authority/ Authority Engineer.

9 ROADSIDE FURNITURE

- 9.1 Roadside furniture shall be provided in accordance with the provisions of the Manual.
- 9.2 Overhead traffic signs and Informatory signs:

Sizes of overhead traffic signs shall be as per relevant section of the Manual.

The minimum number of various overhead traffic signs and informatory signs are given below:

| Sl. No. | Description | Numbers |
|---------|------------------|---|
| 1 | Informatory sign | 26 |
| 2 | Overhead sign | 4 (Full width: 2 nos. & Cantilever: 2 nos.) |

Note: Site survey done by the Contractor and size, location & Number of gantry/overhead/informatory traffic sign shall be finalized in consultation with Authority/ Authority Engineer.

10 ROAD SAFETY DURING CONSTRUCTION

All precaution shall be taken for road user safety & Safety of works as per manual such as Bollard, tapes, has to be maintained by the contractor compulsory at side.

11 COMPULSORY AFFORESTATION/TRANSLOCATION OF TREES

The number of trees which are required to be cut/ translocated should be as per policy of Government of Bihar and as per Forest Conservation Act and the cutting of trees/translocation of trees shall be included in the Contractor scope,

12 HAZARDOUS LOCATIONS

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

| Sl. No. | Location stretch from (km) to (km) | LHS/RHS |
|-------------------------------|------------------------------------|---------|
| As per typical cross section. | | |

Note – Location of hazards location shall be finalized in Consultation with Authority/Authority Engineer.

13 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. So same shall be provided accordingly.

14 CHANGE OF SCOPE

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

Note: Length of drain $\pm 5\%$ as per Cross Section TCS & TCS will not be considered as change of Scope, Location of wayside amenities may be finalized in consultation with Authority Engineer/Authority.

Not to be used as a Bid Document, Only for Reference

**APPENDIX B 1: TCS, P&P & Structure GADs
(Drawing Volume-III enclosed separately)**

Not to be used as a Bid Document, Only for Reference

Schedule B-1

The shifting of utilities and felling/translocation of trees shall be carried out by the Contractor. The cost of the same shall be borne by the Authority.
The details of structures are as follows: (tentative)

| S/No. | Design Ch. | Type of STR | Road Side | Proposed Center Line distance (M) |
|-------|------------|-------------|-----------|-----------------------------------|
| 1 | 0+480 | Temple | LHS | 2.5 |
| 2 | 0+610 | Temple | RHS | 22.5 |
| 3 | 0+835 | Temple | RHS | 16 |
| 4 | 1+030 | Temple | LHS | 19 |
| 5 | 1+220 | Temple | LHS | 4.25 |
| 6 | 1+240 | Temple | LHS | 4.25 |
| 7 | 1+420 | Temple | LHS | 11.5 |
| 8 | 1+490 | Temple | LHS | 5 |
| 9 | 1+605 | Temple | LHS | 9 |
| 10 | 5+030 | Temple | RHS | 7.5 |
| 11 | 5+330 | School | LHS | 10 |
| 12 | 5+775 | Temple | LHS | 5 |
| 13 | 5+902 | Temple | RHS | 11 |
| 14 | 6+025 | School | RHS | 12.5 |
| 15 | 6+237 | Temple | LHS | 4.2 |
| 16 | 6+278 | Temple | RHS | 4.1 |
| 17 | 6+315 | Temple | LHS | 4 |
| 18 | 6+315 | Temple | RHS | 14 |
| 19 | 8+625 | Temple | RHS | 5 |
| 20 | 10+050 | Temple | LHS | 40 (Bypass) |

SCHEDULE - C

(See Clause 2.1)

PROJECT FACILITIES

1. PROJECT FACILITIES

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

- a) Traffic control devices/ road safety devices/ Roadside furniture;
- b) Pedestrian facilities;
- c) Landscaping & Tree plantation;
- d) Bus Bays with Bus Shelter
- e) Truck lay-byes/ truck terminal/ wayside amenities
- f) Utility Pipe Duct across the road
- g) Street lighting and High Mast Light
- h) Traffic Aid post
- i) Medical Aid Posts
- j) Vehicle Rescue Posts

2. PROJECT FACILITIES FOR TWO LANING

Project Facilities forming part of Two-Laning with Paved Shoulder to be completed on or before the project completion date have been described in **Annex-I** of this **Schedule-C**.

Not to be used as a Bid Document, Only for Reference

**ANNEX-I
(Schedule-C)**

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) Traffic control devices/ road safety devices/ Roadside furniture;
- b) Pedestrian facilities;
- c) Landscaping & Tree plantation;
- d) Bus Bays with Bus Shelter
- e) Truck lay-byes/ truck terminal/ wayside amenities
- f) Utility Pipe Duct across the road
- g) Street lighting and High Mast Light
- h) Traffic Aid post
- i) Medical Aid Posts
- j) Vehicle Rescue Posts

2 Description of Project Facilities

Each of the Project Facilities is described below:

- a) **Traffic control devices/ road safety devices/ Roadside furniture**
The provision of traffic control devices/ road safety devices shall be made as per specifications and standards as specified in Schedule D and in consultation with the Authority Engineer/Authority.

The roadside furniture shall include the provision of the following:

i. Traffic Signs

Traffic Signs includes the Road Side Signs, Overhead signs and Kerb mounted signs along the Project Highway as per Manual and Schedule B.

ii. Pavement Markings

Pavement marking shall cover the road marking for the Project Highway as per Manual.

iii. Road Delineators

Road delineators shall be provided in accordance with the Manual. The minimum numbers of delineators are given below as minimum criteria in line with the manual:

| Sl. No. | Unit (Numbers) |
|-------------|----------------|
| Delineators | 564 |

iv. Reflective Pavement Markers (Road Studs)

Road Studs shall be provided in accordance with the Manual.

v. **Boundary stones**

Boundary Stones shall be provided in accordance with the relevant manual.

vi. **Hectometer/Kilometer Stone**

Hectometer/km Stones shall be provided in accordance with relevant Manual.

vii. **Crash Barrier**

1. W - beam Type Crash Barrier shall be provided for a minimum length of 16200 m in accordance with the Manual and as per consultation by the Authority/Authority Engineer.
2. Metallic Crash Barrier/Concrete Crash Barrier shall be provided for length of approach of ROB in accordance with the Manual and as per consultation by the Authority/Authority Engineer.

b) Pedestrian Facilities

Pedestrian Facilities include the provision of:

- i. Footpath (width as per typical cross section) shall be provided over proposed drains for entire length as per the Manual and as per consultation by the Authority/Authority Engineer.
- ii. Pedestrian Guard Rail (MS Grill) – Pedestrian Guard Rail MS grill shall be provided at each bus stop location and as per consultation by the Authority/Authority Engineer.

c) Landscaping and Tree Plantation

This work will be done by Forest & Environmental Department, Government of Bihar.

d) Bus bays with bus shelters

Bus bays/bus shelters shall be provided as per specifications and standards given in Manual.

The Contractor shall provide minimum 6 nos. Bus Bays along the project highway and the locations as given below:

| Sl. No | Chainage | Side |
|--------|----------|------|
| 1 | 0+930 | RHS |
| 2 | 1+800 | LHS |
| 3 | 5+960 | LHS |
| | 6+375 | RHS |
| 5 | 10+595 | LHS |
| 6 | 10+890 | RHS |

Note: The locations of these bus bays shall be finalized by the Contractor in consultation with the Authority Engineer/Authority.

e) **Truck Terminal/Wayside Amenities/Truck Lay Bys**

The Truck Terminal / Wayside Amenities / Truck Lay-Bys shall be provided as per specifications and standards specified in Manual. However, suitable locations shall be decided in consultation with Authority Engineer/Authority.

f) **Utility pipe ducts**

Provision of accommodating utilities has been made over as well as underground within utility corridor on either side of the Project Highway with 300 mm across the road width at 1000 mm spacing and also at suitable locations as decided in consultation with Authority Engineer/Authority.

g) **Street/highway Lighting and High Mast Light**

107 nos. of Single/Double Arm Street/highway lighting shall be provided in accordance with the Manual. Locations shall be as per requirement of the manual. Apart from the locations specified in the manual, High Mast Lighting shall be provided at the following tentative locations:

| Sl. No. | Major junction Locations | Remarks |
|---------|--------------------------|---------|
| 1 | 0+000 | |
| 2 | 0+780 | |
| 3 | 6+160 | |
| 4 | 14+125 | |
| Sl. No. | ROB | |
| 1 | 0+185 (Manasi) | |
| Sl. No. | Railway Level Crossing | |
| 1 | 7+800 | |

Note: The EPC contractor has to operate and maintain the street lighting (including payment of Electricity bills) during Defect Liability period including Maintenance period. After completion of defect liability period including Maintenance period, the same shall be handed over to local body through BSRDC.

h) **Traffic Aid Posts**

Traffic aid posts shall be provided as per specifications and standards specified in Schedule D.

i) **Medical Aid Posts**

Medical Aid Posts shall be provided as per specifications and standards specified in Schedule D.

j) **Vehicle Rescue Posts**

Vehicle rescue posts shall be provided as per specifications and standards specified in Schedule D.

SCHEDULE - D
(See Clause 2.1)

SPECIFICATIONS AND STANDARDS

1 Construction

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

2 Design Standards

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

- i) Manual of Specifications and Standards for Two Lane Highways IRC:SP:73-2018, referred to herein as the Manual.
- ii) Guidelines for the use of interlocking concrete block pavement IRC: SP:63-2004, referred for paver blocks.
- iii) Guidelines for the Design of Plain Jointed Rigid Pavements for Highways, IRC: 58-2015, referred for rigid pavement.
- iv) Guidelines for the Design of Flexible Pavements, IRC: 37-2019, referred for flexible pavement.
- v) Guidelines for load testing of bridges, IRC: SP: 51-2014, referred for bridge load test.

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Annex - I

(Schedule-D)

Specifications and Standards for Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two Laning of Highways (IRC:SP:73-2018) and MORTH Specifications for Road and Bridge Works (5th Revision issued by Ministry of Surface Transport (Roads wing), Govt. of India and published by Indian Roads Congress.. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

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 “Contractor”, “Authority’s Engineer” 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 as per TCS provided in Schedule B and set forth below:

| Sl. No | Item | Manual Clause Reference | Provision as per Manual | Modified Provision |
|--------|--------------|-------------------------|---|---|
| 1. | Right of Way | 2.3 | 45-60 m | As mentioned in Annex II of Schedule A. |
| 2. | Shoulder | 2.6.1 | Width of shoulder 2.5 m paved and 1.5 m earthen | As per TCS given in the Schedule B, to be followed. |

- 1.3 The provisions given in schedule B and EPC Agreement shall supersede to Schedule D in case of any conflict.

2. Additional Specifications

Appendix D-1 Environmental Management Plan

Appendix D-2 Involuntary Resettlement Safeguard Principles for the Project.

Appendix D-1

Environmental Management Plan

1.1 Introduction

The project specific Environment Management plan has been formulated with an aim to avoid, reduce, mitigate, or compensate for adverse environmental impacts/risks and propose enhancement measures. This includes: (i) mitigation of potentially adverse impacts; (ii) monitoring of impacts and mitigation measures during project implementation and operation; (iii) institutional capacity building and training; (iv) compliance to statutory requirements; and (v) integration of EMP with Project planning, design, construction and operation.

The environmental management plan highlighting potential impacts, mitigation measures, legislative requirements, time frame and institutional responsibility are given in succeeding Table.

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ENVIRONMENTAL MANAGEMENT PLAN

| Environment all Issue/Component | Remedial Measure | Reference laws/guideline | Location/Nodes/Sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|--|---|--|--|--|--|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| A. DESIGN AND PRE-CONSTRUCTION PHASE | | | | | | | | |
| I. PRE-CONSTRUCTION ACTIVITIES BY PIU, BSRDCL | | | | | | | | |
| 1. Alignment/Pavement Design/Road Safety | | | | | | | | |
| 1.1 Alignment Design due to risk of constricted sections, sharp curves, blind spot etc. | <ul style="list-style-type: none"> Proposed design adopted in accordance with the provisions of the IRC Codes Geometrical design standard features as follows Main Carriageway: Carriageway Width = 1x 7.0m or 10m for Urban (2-lane Flexible/ Rigid), Paved Shoulder = 2 X 1.5m Earthen/ Paver Block Shoulder Width = 2 x 1.0m or 2 x 2.5m Footpath cum Drain = 2x 2.5m (built-up sections) Roadway Width= 12.0m | As per applicable IRC standards and guidelines | <ul style="list-style-type: none"> Widening of whole section from Mansi to Fungo Halt with horizontal and vertical alignment improvements. | <p>MI: Design Parameters compliance to Guideline.</p> <p>PT: Designs are in accordance with site needs</p> | Review of detailed design documents & drawings and comparison with site conditions | Covered under costs for DPR consultant | Design Consultant | BSRDCL |
| 1.2 Pavement Design considering traffic load, pavement damage, overtopping etc. | <ul style="list-style-type: none"> Both Flexible and Rigid pavement has been proposed for the sub-project. Rigid pavement design is based on IRC: 58-2012 and design of flexible pavement is based on IRC 37-2012. Pavement Design life for cement concrete pavement has been performed for 30 years and 15 years for flexible pavements. Proposed cement concrete Pavement has been proposed for 1.6km and Flexible Pavement has been proposed for the remaining sections. 40mm BC has been considered as surface course and 110mm DBM with VG-30 has been considered for Base/binder course of Flexible | Design requirement. IRC: 37-2012, IRC: 58-2011, IRC: SP:73-2007, SP:84-2009 | <ul style="list-style-type: none"> Rigid/ cement concrete pavement has been proposed in the heavily built-up stretch for 1.6 km (km 0.400 to km 1.600 and km 5.970 to km 6.370) Remaining section has been proposed with Flexible bituminous pavement. | <p>MI: Design Parameters compliance to Guideline.</p> <p>PT: Designs are in accordance with site needs</p> | Review of detail design documents & drawings and comparison with site conditions | Covered under costs for DPR consultant | Design Consultant | BSRDCL |

| Environment all issue/Component | Remedial Measure | Reference to laws/guideline | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|---|---|--|--|--|--|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | pavement. • Cement concrete pavement in built-up section with 300mm PQC, 150mm DLC, 150mm GSB and 500mm Sub-grade. | | | | | | | |
| 1.3 Drainage provisions considering inundation, water logging, overtopping due to inadequate drainage provisions. | <ul style="list-style-type: none"> • Embankment height raised above HFL. • Roadside footpath cum line drains to avoid water logging in built-up-sections proposed with suitable outfalls. • Prevention of waterlogging and overtopping due to intensive rainfall. • Heavily built-up and geometrically deficit sections have been avoided. • Increased vent size of existing cross drainage structures having inadequate waterways to control flooding. • Provision of additional cross drainage structures like culverts, bridges etc. | Design requirement IRC: SP: 19, IRC: 37-2012 IRC: SP:73 IRC-SP: 0-1999. | <ul style="list-style-type: none"> • Line drain of 3.860 km (km 0.440 to km 1.600, km 5.970 to km 6.37 and km 10.120 to km 10.450). • Culverts-18 Box is additionally proposed, 4 HPC is to be reconstructed and • 5 Light Vehicular Under passes are proposed. • Major Bridges – 4 New Major Bridges are proposed at km 8.798, km 9.963, km 11.176 and km 11.965. • Minor bridge – 2 nos. of minor bridges are to be reconstructed at km 2.348 and km 3.302 • 1 New ROB is proposed at km 7.807 | MI: Design and number of cross and side drains, PT: Design and numbers of CDs are in accordance with site needs and no incidence of overloading | Review of detail design documents & drawings and comparison with site conditions | Covered under costs for DPR consultant | Design Consultant | BSRDCL |
| 1.4 Safety along the proposed alignment | <ul style="list-style-type: none"> • Geometric Improvements of curves • Provision of crash barriers at accident prone areas and bridges • Speed limitations near educational institutes, hospitals and other CPRs. • Provision of retro-reflective warning signboards near curves, school, hospital, religious places and | Design requirement IRC:SP:73- IRC:8, IRC:25, IRC:26, IRC:35, | <ul style="list-style-type: none"> • Speed Regulatory signage, in built-up/ sensitive locations. • Street lighting in built-up sections and at major junctions proposed. • 7 major junctions are to be | MI: number and location of crash barriers, informative and cautionary sign boards, service roads and Street lighting | Review of design documents and drawings and comparison with site | Covered under costs for DPR consultant | Design Consultant | BSRDCL |

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| Environment all Issue/Com ponent | Remedial Measure | Referencetol aws/guidelin e | Location/Nos./ sections | Monitoring indicators (MI/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|---|--|--|---|---|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | other sensitive location • Provision of sidewalks in the built-up sections on covered drains • Signs and marking viz., delineators, object markers, hazard markers, safety barriers at hazardous locations, • Street Lighting in built-up sections and at major Junctions proposed • Major Junctions to be improved as per IRC/MORTH guidelines. | IRC:67, IRC:103 and Section 800 of MORTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: 23- 1993". IRC: SP: 67- 2012 | improved with appropriate signages. • 18 minor junctions are also to be improved at places village roads. DPRs meets the project road. Total 5 Bus-bays proposed for both side of the project road. | as per design PT: numbers and location are in accordance with site needs : | conditions | | | |
| 2. Natural Hazard/Climate Change Risk | | | | | | | | |
| 2.1 Damage to pavement integrity like Rutting, embankment softening and migration of liquid asphalt. Thermal expansion in bridge expansion joints and paved surfaces | • Asphalt binder specifications based on viscosity-grade specifications as per IS 73-2013 guidelines, and IS 15462 2004 for rubber modified binder and polymer modified binders. | IRC 37 2012 for flexible pavement design, IRC 81 1997 for strengthening of flexible pavement | Entire stretch | MI: Pavement Surface and bridge expansion joints during extreme heat PI: No softening, rutting, asphalt migration/therm al expansion of joint | Review of design documents and drawings and comparison with site conditions | Covered under costs for DPR consultant | Contractor | BSRDC |
| 2.2 Earthquake | • Relevant IS codes have been adopted in designing the structures to sustain the magnitude of earthquake | Dislodgement of superstructure | Entire Stretch | MI: Culverts, Bridges, | Review of design documents | Covered under costs for DPR | Contractor | BSRDC |

| Environment all Issue/ Component | Remedial Measure | Reference laws/ guidelines | Location/ Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|--|--|--|---|---|---|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | corresponding to Seismic zone of the project area. | shall be taken as per Clause 222 of IRC: 6. | | PT: Design conforms BIS and IRC guidelines | and drawings and comparison with site conditions | consultant | | |
| 2.3 Local Flooding/Water Logging | <ul style="list-style-type: none"> Roadside footpath cum lined drains to avoid water logging in built-up-sections proposed with suitable outfalls. Prevention of waterlogging and overtopping due to intensive rainfall. Cross drainage structures designed for 50-year return period Waterways of bridges and culverts have been increased. | IRC:34 Recommendations for road construction in waterlogged areas IRC: 75 and MORT&H guidelines for | <ul style="list-style-type: none"> Roadside footpath cum drains (both sides together) = 3.860 km. Culverts- 18 Box is additionally proposed, 4 HPC is to be reconstructed and 5 Light Vehicular Under passes are proposed. Major Bridges – 4 New Major Bridges are proposed at km 8.798, km 9.963, km 11.176 and km 11.965. Minor bridge– 2 nos. of minor bridges are to be reconstructed at km 2.348 and km 3.302 1 New ROB is proposed at km 7.807 | MI: Design and numbers of cross & Side drains, design and number of bridges PT: Design and numbers are in accordance with site needs | Review of design documents and drawings and comparison with site conditions | Covered under costs for DPR consultant | Contractor | BSRDCL |
| 3. Loss of Land and Assets | | | | | | | | |
| 3.1 Livelihood loss to affected persons | <ul style="list-style-type: none"> Road improvement work to be accommodated within available ROW to the extent possible. Social Impact Assessment and Resettlement Plan to be undertaken as per national policy and ADB' guidelines. The acquisition of land and private properties shall be carried out in | The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation | <ul style="list-style-type: none"> Throughout the corridor (Pls. refer RP) | MI: Payment of compensation and assistance to DPs as per entitlement matrix of RP Number of | Check LA records; design drawings vs. land plans; Interview with | Part of administrative and resettlement costs | BSRDCL and implementing NGO | BSRDCL |

| Environment all Issue/ Component | Remedial Measure | Reference laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|---|---|---|---|--|---|---------------------------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>accordance with the RAP and entitlement framework of the Project.</p> <ul style="list-style-type: none"> BSRDCL has to ascertain that acquisition of land in the post design phase are addressed and integrated into relevant contract documents. Complete all necessary land and property acquisition procedures prior to the commencement of civil work. Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. Compensation and assistance as per project Resettlement Plan Implementation of Income restoration plan as per approved RP Preference in employment and settlement contracts during construction to APs Constitute Grievance Redress Committee as per approved RP | <p>And Resettlement Act, 2013 and ADB's involuntary resettlement policy.</p> <p>Contract Clause for preference of local people during employment.</p> | | <p>complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator/court.</p> | <p>affected persons</p> <p>Check status of employment given to local people during construction</p> | | | |
| 4. Division of Forest Land and Cutting of Trees | | | | | | | | |
| 4.1 Loss of forest flora/ Land use change/ deterioration in local climatic condition/ Increase in Green House effect | <ul style="list-style-type: none"> All efforts shall be made to preserve trees including evaluation of minor design adjustments/alternatives (as applicable) to save trees. Specific attention shall be given for protecting oversized trees, green tunnels and locally important trees (religiously important etc.). Only the bare minimum trees to be felled from the total affected trees. All attempts shall be taken to suitably translocate the trees affected during | <p>Forest Conservation Act, 1980</p> <p>MoRTH 201.2 and 301.5</p> | <ul style="list-style-type: none"> Total number of affected trees=1397² Translocation of trees³ = | <p>MI: location of geometric adjustments to minimize tree cutting, budget allocated for compensatory and additional plantation</p> <p>PT: Unnecessary</p> | <p>Review final design. Check budget provision for compensatory and additional plantation.</p> | <p>Covered under costs for DPR consultants</p> | <p>BSRDCL, Design consultants forest department</p> | <p>BSRDCL/Forest department</p> |

²Figure mentioned is based on inventory prepared.

³Translocation of Trees shall be carried out as per Officer Order of Environment, Forest and Climate Change Division, Govt. of Bihar vide No. Forest Land-39/2012-974/E/PVJP, Patna 15 dated 26/07/2019.

| Environment all Issue/ Component | Remedial Measure | Reference laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|------------------------------|-------------------------|---|-----------------------|---------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>construction as per the Tree translocation Plan.</p> <ul style="list-style-type: none"> Obtaining NOC for felling of trees on Forest Land prior to commencement of construction activities¹ No Forest Diversion involved under Forest (Conservation) Act 1980. Tree felling is to proceed only after all the legal requirements including attaining of In-principle and Formal clearances from the Forest Dept. Particular species declared as "protected" by the State Forest Dept. in the private land shall be felled only after due clearance from the Forest Dept. Trees shall be removed from the Corridor of Impact before the actual commencement of the work after obtaining the permission from the state Forest Department. Tree felling shall not commence until the implementation of the project in that particular stretch is confirmed. Stacking, transport and storage of the timber shall be done as per the relevant norms. Compensatory plantation (1:3) as per Bihar Government's Forest Department circular dated 28.01.13 and 29.03.2016 Provision for additional plantation on 1:7 basis to be implemented and guided by Tirhut model (TOR Attached with this EMP) Systematic corridor level documentation for the trees cut and | | | tree felling on forest land avoided. Budget allocation is adequate, | | | | |

¹NOC shall be obtained based on Guidebook on application & inspection procedure for obtaining NOC/Transit Permit for Tree felling/transportation of Environment and Forest Dept, Govt. of Bihar. Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95) in the State of Bihar on EPC Mode

| Environment all Issue/ Component | Remedial Measure | Reference laws/ guidelines | Location/Nos./ sections | Monitoring indicators (MI/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|----------------------------------|--|--|---|-------------------------------|------------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervi sion |
| | those saved shall be maintained by BSRDCL. | | | | | | | |
| 5. Shifting of Utilities | | | | | | | | |
| 5.1 Disruption of utility services to local community | <ul style="list-style-type: none"> Geometric adjustment has been made to minimize shifting need and/or the loss to any such facilities. All community utilities and properties i.e., hand pumps, open wells, water supply lines, sewer lines, telephone cables, buildings and health centers shall not be relocated before construction of sub-project road starts. Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any. Relocation of wells, hand pumps at suitable locations with consent from local community. | Project requirement | Throughout the corridor | <p><u>MI</u>: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities</p> <p><u>PT</u>: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting</p> | Interaction with concerned utility authorities and local public | Included under BSRDCL's costs | Contractor/ BSRDCL/utility company | BSRDCL /CSC |
| 5.2 Relocation of affected Cultural and Religious Properties | <ul style="list-style-type: none"> All religious property resources such as shrines, temples and mosques within the project road shall be relocated. If there is any relocation of the religious structures may happen then it shall be identified in accordance with the choice of the community. BSRDCL in consultation with local people shall finalize those. The entire process (i.e., selection of relocation sites and design) shall be under supervision of Environmental Specialist of CSC during the construction stage by the Contractor. The relocation shall be completed | MoRTH 110.7 | Throughout the stretch especially nearby settlements | <p><u>MI</u>: Number of Religious structures within Col. Finalization of relocation site in consultation with local community.</p> <p><u>PT</u>: No. of complaints should be 0. Relocation of structures in</p> | Consultation with local community | Included under BSRDCL's costs | BSRDCL/ Contractor | CSC/ BSRDCL |

| Environment all Issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|---|--|--|---|-------------------------------|---|-------------|
| | | | | | | | Implementation | Supervision |
| | before the construction starts in these sites. | | | consultation with local community at their preferred locations within shortest possible | | | | |
| II. PRE-CONSTRUCTION ACTIVITIES BY THE CONTRACTOR/ENVIRONMENTAL SPECIALIST OF CSC | | | | | | | | |
| 1. Field Verification and Modification of the Contract Documents | | | | | | | | |
| 1.1 Joint Field Verification | <ul style="list-style-type: none"> Environmental Specialist of CSC and the Contractor shall carry out joint field verification to ascertain any possibilities of saving trees, environmental and community resources, and these activities are to be taken up by the construction contractor. | MoRTH 012 | Throughout the stretch of project | <p><u>MI</u>: Joint verification of features at site</p> <p><u>PT</u> Unnecessary tree felling to be avoided. Possibility of saving community features to be explored.</p> | Physical verification of features | Included under BSRDCL's costs | Contractor/ Environmental Specialist of CSC | BSRDCL |
| 1.2 Assessment of Impacts due to Changes/ Revisions/ additions in the Project Work | <ul style="list-style-type: none"> The Environmental Specialist of CSC shall assess impacts and revise/modify the EMP and other required sections of the project document/s in the event of changes/ revisions (including addition or deletion) in the project's scope of work. | | Where ever changes are applicable | <p><u>MI</u>: Joint verification of features at site.</p> <p><u>PT</u> Updation in impact and mitigation measures due to proposed change</p> | Physical verification at changed location | Included under BSRDCL's costs | Contractor/ Environmental Specialist of CSC | BSRDCL |
| 1.3 Crusher Hot-mix plants and Batching Plants | <ul style="list-style-type: none"> All construction plants shall be sited sufficiently away from settlements and agricultural operations or any commercial establishments. Such plants shall be located at least 1.0 km | MoRTH 111.1, Air (prevention of pollution) Act, | At all Crushers, Hot-mix plants and Batching Plants opened up for the construction of project road | <u>MI</u> : Siting criteria as per statutory provisions of Pollution | Checking of copy of valid NOC obtained from State | Incidental | Contractor/ Environmental Specialist of CSC | BSRDCL |

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Section-6: EMP

| Environment Issue/Component | Remedial Measure | Reference laws/guideline | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|--|---|--|---|--------------------|---|-------------|
| | | | | | | | Implementation | Supervision |
| Location | <p>away from the nearest dwelling preferably in the downwind direction.</p> <ul style="list-style-type: none"> The Contractor shall submit a detailed layout plan for all such sites and approval of Environmental Specialist of CSC shall be necessary prior to the establishment. Arrangements to control dust pollution through provision of windscreens, water sprinklers, and dust extraction systems shall have to be provided at all such sites. Specifications for crushers, hot mix plants and batching plants shall comply with the requirements of the relevant emission control legislations. Consent for the Establishment and Operation from BSPCB shall be obtained before establishment and operation respectively and a copy should be submitted to the CSC and BSRDCL. Wherever there are extremely water scarcity areas exist, the Water sprinkling shall be limited to one time in the morning. To balance this deficient information boards shall be erected at appropriate locations with a message to "Dust prone area take precautions". | 1981 and Noise Rules | | <p>Control Board. The agreement with the land owner for the land where the establishment of plant proposed by the contractor.</p> <p><u>PT:</u> The siting of plants as per norms. Status of obtaining NOC (CtE & CtO) from state Pollution Control Boards</p> | Pollution Control Board and copy of agreement with land owner whose land will be utilized for establishment of plants | | | |
| 1.4 Other Construction Vehicles, Equipment and Machinery | <ul style="list-style-type: none"> All vehicles, equipment and machinery to be procured for construction shall conform to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 and Motor Vehicles Act, 1988 shall be strictly adhered to. The silent/quiet equipment available in the market shall be used in the Project. | Air pollution Control Act, and Noise Rules and Motor Vehicle Act, 1988 | Applicable to all vehicles used in the construction | <p><u>MI:</u> verification of valid PUC</p> <p><u>PT:</u> verification of valid PUC. Zero deviation/ complaints about pollution</p> | Verification of PUC certificate | Part of Civil Cost | Contractor/ Environmental Specialist of CSC | BSRDCL |

| Environment all Issue/ Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|--|--|--|---|------------------------------|--|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | The Contractor shall maintain a record of PUC for all vehicles and machinery used during the contract period which shall be produced to EO, BSRDCL's verification whenever required. | | | | | | | |
| 1.5 Construction Camp Locations - Selection, Design and Layout | <ul style="list-style-type: none"> Siting of the construction camps shall be as per the guidelines and details of layout to be approved by CSC Resident Engineer and environment specialist. Camps to maintain minimum distance from following: <ul style="list-style-type: none"> # 500 m from nearest settlements to avoid conflicts # 500 m from forest areas where possible # 500 m from water bodies where possible # 500 m from through traffic route Construction camps shall not be proposed and stress over the infrastructure facilities with the local community. Location for stockyards for construction materials shall be identified at least 300m away from watercourses. Contractor's camps shall be identified at least 05 km away from the Reserved/Protected Forest. | As per IRC guidelines and contract documents. | Construction camps | <p><u>MI</u>: The agreement with the land owner for the land where the camp site is proposed by the contractor</p> <p><u>PT</u>: The siting of camp as per norms. Status of agreement with the land owner. Zero complains and accidents at camp site. Provision of basic facilities and tier maintenance</p> | Checking of copy of agreement with land owner whose land will be utilized for establishment of camp. Review of basic facilities and their conditions. Complaints of the residents staying in the camp | Part of Civil Cost | Contractor/ Environmental Specialist of CSC | BSRDCL/ CSC |
| 2. Identification and Selection of Material Sources | | | | | | | | |
| 2.1 Borrow area Identification and Approval | <ul style="list-style-type: none"> Finalizing soil borrowing earth and all logistic arrangements as well as compliance to environmental requirements as applicable, shall be the sole responsibility of the Contractor. Contractor shall not start borrowing earth from selected borrow area until the formal agreement is signed | IRC Guidelines on borrow areas and quarries; EPA 1986 and MoRTH 111.2 and 305.2.2 Specifications | Contractor is responsible for identifying the borrow area with all leads and lifts conforming Technical Specification after securing all permits as per Law of the Land. | <p><u>MI</u>: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices.</p> | Review of design documents and site observations Inspection of site for | Included in civil works cost | Contractor | BSRDCL /CSC |

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| Environment all Issue/ Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|--|--|--|---|------------------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>between landowner and Contractor and a copy is submitted to the CSC.</p> <ul style="list-style-type: none"> Locations finalized by the Contractor shall be reported to the Environmental Specialist of CSC and he shall submit the report to BSRDCL. Planning of haul roads for accessing borrows areas shall be undertaken during this stage. The haul roads shall be routed to avoid agricultural areas as far as possible and shall use the existing village roads wherever available. The environmental specialist of the CSC shall be required to inspect every borrow area location prior to its approval. CSC to include the Request for Inspection form for borrow area assessment and approval from the environmental perspective. Non-productive, barren lands to be used for borrowing earth with the necessary permissions/consent. | for Road and Bridgeworks Guidelines for Borrow Areas management | | <p>Number of accidents. Complaints from local people.</p> <p><u>PT</u>: No case of non-compliance to the technical specification and air act. Zero accidents. Zero complaints.</p> | approval on environmental consideration | | | |
| 2.2 Quarry operations | <ul style="list-style-type: none"> Contractor shall finalize the quarry for procurement of construction materials after assessment of the availability of sufficient quantity of materials, quality and other logistic arrangements. Contractor shall also work out haul road network and report to Environmental Specialist of CSC and CSC shall inspect and report to BSRDCL before approval. Copies of consent/ approval/ rehabilitation plan for a new quarry or use of existing source will be submitted to BSRDCL. The contractor will develop a Quarry | Clause No. 111.3 MORT&H Specifications for Road and Bridgeworks Guidelines VI for Quarry Areas Management Environmental Protection Rules | Identified Quarry location. Contractor is responsible for identifying the source conforming Technical Specification after securing all permits as per Law of the Land. | <p>MI: Existence of licenses quarry areas from which materials to be sourced and Existence of a quarry redevelopment plan</p> <p><u>PT</u>: Quarry license is valid.: No case of non-compliance to consent</p> | Review of design documents, contractor documents and site observation Compliance to EC conditions in case of opening new quarries | Included in civil works cost | Contractor | BSRDCL /CSC |

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| Environment all Issue/ Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|---|--|---|---|---|--|---------------------------------|---------------------------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>Redevelopment plan, as per the Mining Rules of the state and submit a copy of the approval to EA.</p> <ul style="list-style-type: none"> Contractor will obtain environmental clearance (EC) from SEIAA/ DEIAA for identified quarry if intended to open new quarry site. Comply to EC conditions of SEIAA/DEIAA. The Contractor will obtain lease license from Department of Geology and Mines | | | conditions and air quality meets the prescribed limit | | | | |
| 2.3 Sand | <ul style="list-style-type: none"> The Sand shall be procured from identified sand mines as far as possible. The Contractor shall obtain copy of the Lease Agreement of the supplier and submit to CSC before procuring the sand. | As per the contract document | Sand quarries being used for the construction. All riverbeds recommended for sand extraction for the project. | <p>MI: Existence of licenses quarry areas from which materials to be sourced and Existence of a quarry redevelopment plan</p> <p>PT: Quarry license is valid.: No case of non-compliance to consent conditions and air quality meets the prescribed limit</p> | Review of design documents, contractor documents and site observation Compliance to EC conditions in case of opening new quarries | Included in civil works cost | Contractor | Environmental Specialist of CSC |
| B. CONSTRUCTION STAGE | | | | | | | | |
| 1. Air Quality | | | | | | | | |
| 1.1 Dust Generation due to construction activities and transport, | Contractor shall take every precaution to reduce the level of dust from construction plants, construction sites involving earthwork by sprinkling of water, encapsulation of dust source. | MORT&H Specifications for Road and Bridge works Air (P and | Throughout project corridor | MI: PM10 level measurements Complaints from locals due to dust | Standards CPCB methods Observations Public | Included in civil works cost/ Incidental to work | Contractor | BSRDCL /CSC |

| Environment all Issue/Component | Remedial Measure | Reference laws/guideline | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|--|---|---|---|---|------------------------------|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| storage and handling of construction materials | <ul style="list-style-type: none"> Contractor to submit location and layout plan for storage areas of construction materials approved by CSC. Contractor shall erect the construction plants and machinery, which shall conform to the pollution control norms specified by MoEF&CC/CPCB Transport, loading and unloading of loose and fine materials through covered vehicles. Paved approach roads. Storage areas to be located downwind of the habitation area. Water spraying on earthworks, unpaved haulage roads and other dust prone areas. Provision of PPEs to workers. | CP) Act 1974 and Central Motor and Vehicle Act 1988 General Conditions of Bid Document | | <p><u>PT</u>: PM10 level < 100 g/m³ Number of complaints should be 0.</p> | <p>consultation</p> <p>Review of monitoring data maintained by contractor</p> | | | |
| 1.2 Emission of air pollutants (HC, SO ₂ , NO _x , CO etc.) from vehicles due to traffic congestion and use of equipment and machinery | <ul style="list-style-type: none"> Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant statutory requirements of CPCB and Motor Vehicles Rules Batching, as well as mixing plants and crushers at downwind (1km) direction from the nearest settlement. Only crushers licensed by the SPCB shall be used. DG sets with stacks of adequate height and use of low Sulphur diesel as fuel. Contractor shall submit PUC certificates for all vehicles/equipment/machinery used for the project. LPG should be used as fuel source in construction camps instead of wood Ambient air quality monitoring is to be conducted as per the monitoring plan | The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982 Annexure 'A' to MoRTH 501 MoRTH:111.10 Contract Agreement | Asphalt mixing plants, crushers, DG set's locations | <p><u>MI</u>: Levels of HC, SO₂, NO₂, and CO. Status of PUC certificates</p> <p><u>PT</u>: SO₂ and NO₂ levels are both less than 80ug/m³. PUC certificate of equipment and machinery is up to date</p> | <p>Standards CPCB methods</p> <p>Review of monitoring data maintained by contractor</p> | Included in civil works cost | Contractor | BSRDCL /CSC |

| Environment all issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|--|---|---|--|---|-------------------------------|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | <ul style="list-style-type: none"> Contractor to prepare traffic management and dust suppression plan duly approved by BSRDCL | | | | | | | |
| 2. Noise | | | | | | | | |
| 2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery | <ul style="list-style-type: none"> All Construction plants and equipment used in construction shall strictly conform to the MoEF&CC/CPCB noise standards. Construction equipment and machinery to be fitted with silencers and maintained properly. All equipment to be timely serviced and properly maintained. The equipment available in the market should be procured, if the Contractor plans to purchase new equipment. For the old equipment, necessary or possible alterations must be carried out to reduce the noise level to the possible extent. At the construction sites within 150 m of the nearest habitation, noisy construction work (such as crushing, operation of Drills, use of high noise generation equipment shall be stopped during the night time between 10.00 pm to 6.00 am. Working hours of the construction activities shall be restricted around educational institutions/Health Centers (silent zones) up to a distance of 100 m from the sensitive receptors i.e., School, Health Centers and Hospitals etc. during off hours only. Implement noisy operations intermittently to reduce the overall noise exposure. Manage existing traffic to avoid traffic jams and accumulation of noise beyond | Legal requirement Noise Pollution (Regulation and Control) rules, 2000 and amendments thereof Clause No 501.8.6. MORT&H Specifications for Road and Bridge works | Throughout project section especially at construction sites, residential and identified sensitive locations. Refer supplementary tables to EMP for information on sensitive receptors. Noise barriers at Schools at km 5+400 (LHS) and km 13+100 (LHS). | MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas | As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site | Included in civil works costs | Contractor | BSRDCL /CSC |

Not to be used as a Bid Document, Only for Reference

| Environment all Issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|--|--|--|--|---|-------------------------------|-----------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | <p>standards.</p> <ul style="list-style-type: none"> Restrict construction near residential, built up and forest areas construction to daylight hours. Honking restrictions near sensitive areas PPEs to workers. Noise monitoring shall be carried out at the locations specified in monitoring plan by the BSRDCL and the Engineer through the approved monitoring agency. | | | | | | | |
| 3. Land and Soil | | | | | | | | |
| 3.1 Land use Change and Loss of productive/top soil | <ul style="list-style-type: none"> Non-agricultural areas to be used as borrow areas to the extent possible. In case agricultural and is used, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use. To prevent any compaction of soil in the adjoining productive agricultural lands, the movement of construction vehicles, machinery and equipment's will be restricted to project corridor as much as possible. | Project requirement | <p>Throughout the project section and borrow areas</p> <p>Land identified for camp, storage areas etc.</p> | <p>MI: Borrow pit locations/Top soil storage area</p> <p>PT: Zero complaints or disputes registered against contractor by land owner</p> | Review borrow area plan, site visits | Included in civil works cost | Contractor | BSRDCL /CSC |
| 3.2 Slope failure and Soil erosion due to Construction activities earthwork, and cut and fill stockpiles etc. | <ul style="list-style-type: none"> After construction of road embankment, the side slopes shall be covered with grass and shrubs as per design specifications. Slope protection by providing Grass turving, stone pitching, masonry retaining walls, at high embankments Side slopes of all cut and fill areas will be graded and covered with stone | IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 | At bridge approaches; high embankment sections (Low lying areas) and borrow pits. | <p>MI: Occurrence of slope failure or erosion issues</p> <p>PT: No slope failures. Minimal erosion issues</p> | Review of design documents and site observation | Included in civil works cost/ | Design consultant and Contractor, | BSRDCL /CSC |

| Environment all issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---------------------------------|--|---|--|--|---|------------------------------|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | <p>pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1.</p> <ul style="list-style-type: none"> The earth stock piles to be provided with gentle slopes to soil erosion. In borrow pits, the depth shall be so regulated that the sides of the excavation shall have a slope no steeper than 1 vertical to 2 horizontal, from the edge of the final section of the bank. Along sections abutting water bodies, pitching as per design specification shall protect slopes. | MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion | | | | | | |
| 3.3 Borrow area management | <ul style="list-style-type: none"> No borrow area shall be opened without permission of the Environmental Specialist of CSC. The location, shape and size of the designated borrow areas shall be as approved by the Environmental Specialist of CSC and in accordance to the IRC recommended practice for borrow pits for road embankments (IRC:1961). Non-productive barren lands, to be used for borrowing earth with the necessary permissions/consents. The borrowing operations shall be carried out as specified in the guidelines for siting and operation of borrow areas. The unpaved surfaces used for the haulage of borrow materials, if passing through the settlement areas or habitations; shall be maintained dust free by the Contractor. Sprinkling of water shall be carried out twice a day to control dust along such roads during | CSC Guidelines on borrow areas and for quarries (Environmental protection Act and Rules, 1986; Water Act, Air Act) + Clause 305.2.2 MORTH Specifications for Road and Bridge works Guidelines for Borrow Areas management | Contractor is responsible for identifying the borrow area with all leads and lifts conforming Technical Specification after securing all permits as per Law of the Land. | <p><u>MI</u>: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people.</p> <p><u>PT</u>: No case of non-compliance to statutory norms and technical specification Zero accidents. Zero</p> | <p>Review of design documents and site observations</p> <p>Compare site conditions with Land owner's agreement and statutory/ environmental approvals</p> | Included in civil works cost | Contractor | BSRDCL /CSC |

| Environment all Issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---------------------------------|---|--|--|--|---|------------------------------|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | <p>their period of use.</p> <ul style="list-style-type: none"> During dry seasons (winter and summer) frequency of water sprinkling shall be increased in the settlement areas and Environmental Specialist of CSC shall decide the sprinkling time depending on the local requirements. Depths of borrow pits to be regulated and sides not steeper than 25%. Topsoil to be stockpiled and protected for use at the rehabilitation stage. Transportation of earth materials through covered vehicles. Borrow areas not to be dug continuously. Contractor shall rehabilitate the borrow areas as soon as borrowing of soil is over from a particular borrow area in accordance with the approved Borrow Area Redevelopment Plan. | | | complaints. | | | | |
| 3.4 Quarry Operations | <ul style="list-style-type: none"> Aggregates will be sourced from existing licensed quarries. The Contractor shall obtain materials from quarries only after consent of the Department of Mines & Geology and District Administration. Copies of consent/ approval / rehabilitation plan for a new quarry or use of existing source will be submitted to BSRDCL. Contractor will extract the materials as per approved mining plan. Contractor will develop a Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the approval to EA. The Contractor will comply with the conditions stipulated in the | Clause No. 111.3 MoRT&H Specifications for Road and Bridgeworks Guidelines VI for Quarry Areas Management Environmental Protection Rules | Contractor is responsible for identifying the source conforming Technical Specification after securing all permits as per Law of the Land. | <p>MI: Existence of licenses quarry areas from which materials to be sourced and Existence of a quarry redevelopment plan</p> <p>PT: Quarry license is valid.: No case of non-compliance to consent conditions and air quality meets the</p> | Review of design documents, contractor documents and site observation Compliance to EC conditions in case of opening new quarries | Included in civil works cost | Contractor | BSRDCL /CSC |

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| Environment all Issue/ Component | Remedial Measure | Reference laws/ guidelines | Location/ Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|----------------------------------|--------------------------------|--|-----------------------|---------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>Environmental clearances and mining lease.</p> <ul style="list-style-type: none"> In case blasting is required for extraction of stone from quarry, the contractor will follow the following guidelines: Except as may be provided in the contract or ordered or authorized by the Engineer, the Contractor shall not use explosives. Where the use of explosives is so provided or ordered or authorized, the Contractor shall comply with the requirements of the following Sub-Clauses of MoRTH 302 besides the law of the land as applicable. Contractor shall at all times take every possible precaution and shall comply with appropriate laws and regulations relating to the importation, handling, transportation, storage and use of explosives. The contractor shall at all times when engaged in blasting operations, post sufficient warning flagmen, to the satisfaction of the Engineer. Contractor shall at all times make full liaison with and inform well in advance and obtain such permission as is required from all Government authorities, public bodies and private parties whomsoever concerned or affected or likely to be concerned or affected by blasting operations. Blasting shall be carried out only with permission of the Engineer. All the statutory laws, regulations, rules etc., pertaining to acquisition, transport, | | | prescribed limit | | | | |

Not to be used as a Bid Document, Only for Reference

Section-6: EMP

| Environment all Issue/Com ponent | Remedial Measure | Reference to laws/guidelin e | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|------------------------------------|---|---|-----------------------|------------------------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>storage, handling and use of explosives shall be strictly followed.</p> <ul style="list-style-type: none"> Blasting shall be carried out during fixed hours (preferably during mid-day) or as permitted by the Engineer. The timing should be made known to all the people within 1000 m (200 m for pre-splitting) from the blasting site in all directions. | | | | | | | |
| 3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment | <ul style="list-style-type: none"> Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. Land taken for construction camp and other temporary facility shall be restored to its original conditions. | Design requirement | Parking areas, Haulage roads and construction yards. | <p>MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not been restored to its original condition</p> <p>PT: Zero occurrence of destroyed/compacted land and undestroyed land</p> | Site observation | Included in civil works cost | Contractor | BSRDCL /CSC |

| Environment all Issue/ Component | Remedial Measure | Reference laws/ guidelines | Location/ Nos./ sections | Monitoring indicators (MI/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|----------------------------------|--|--|---|------------------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| 3.6 Contaminati on of soil due to leakage/ spillage of oil, bituminous and non- bituminous debris generated from demolition and road construction | <ul style="list-style-type: none"> Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. Fuel storage and refueling sites to be kept away from drainage channels. Unusable debris shall be dumped in ditches and low-lying areas. To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. Waste oil and oil-soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF&CC/SPCB authorized vendors Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. Bituminous wastes will be disposed off in an identified dumping site approved by the SPCB. | Design requirement | Fueling station, construction sites, and construction camps and disposal station. | MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no – contamination. No sighting of spilled oil or bitumen in construction site or camp site | Site observation | Included in civil work cost. | Contractor | BSRDCL /CSC |
| 4. Water Resources | | | | | | | | |
| 4.1 Sourcing of water during Construction | <ul style="list-style-type: none"> Water availability and supply to nearby communities unaffected. Requisite permission shall be obtained for abstraction of groundwater from Central Groundwater Authority in view of National Green Tribunal. Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. Water intensive activities not to be undertaken during summer season. Groundwater Augmentation by converting borrow areas into ponds | CGWA Guidelines | Throughout the Project section and enhancement of existing roadside water harvesting structures being used by local peoples. | MI: Approval from competent authority. Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people. | Checking of documentation Talk to local people | Included in civil works cost | Contractor | BSRDCL /CSC |

Section-6: EMP

| Environment Issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|---|---|--|---|---|------------------------------|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | <ul style="list-style-type: none"> Enhancement of community ponds. | | | | | | | |
| 4.2 Disposal of water during construction | <ul style="list-style-type: none"> Provisions shall be made to connect roads side drains with existing nearby natural drains. | Clause No. 101 of EP Act 1986 or MORTH Specifications for Road and Bridge works | Throughout the Project section | <p><u>MI</u>: Condition of drainage system in construction site. Presence/absence of water logging in project area.</p> <p><u>PT</u>: Existence of proper drainage system. No water logging in project area</p> | Standards methods Site observation and review of documents | Included in civil works cost | Contractor | BSRDCL /CSC |
| 4.3 Alteration in surface water hydrology | <ul style="list-style-type: none"> Existing drainage system to be maintained and further enhanced. Provision shall be made for adequate size and number of cross drainage structures especially in the areas where land is sloping towards road alignment. Road level shall be raised above HFL level wherever road level is lesser than HFL. Culverts reconstruction shall be done during lean flow period. In some cases, these minor channels may be diverted for a very short period (15-30 days) and will be bring back to its original course immediately after construction. Temporary water diversions after approval of CSC shall be provided on requirement at bridge and culverts construction locations to maintain the natural flow unobstructed. | Design requirement, Clause No 501.8.6. MORTH Specifications for Road and Bridge | Rivers, canal, streams and nallah passing through the proposed road. | <p><u>MI</u>: Proper flow of water in existing streams and rivers</p> <p><u>PT</u>: No complain of water shortage by downstream communities. No record of overtopping/ water logging</p> | Review of design documents Site observation | Included in civil works cost | Contractor | BSRDCL /CSC |

| Environment all Issue/ Component | Remedial Measure | Reference to laws/ guidelines | Location/ Nos./ sections | Monitoring indicators (MI/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|---|--|---|---|------------------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| 4.4 Siltation in water bodies due to construction activities/earthwork | <ul style="list-style-type: none"> Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. Provision of Silt fencing shall be made at water bodies. Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. Earthworks and stone work to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. Retaining walls at water bodies /ponds to avoid siltation near ponds. | Design requirement, Clause No 501. 8.6.MORT&H Specifications for Road and Bridgeworks Worldwide best practices | Rivers, canal, stream and nallah passing through the proposed road. Pond at km 0+300 (LHS), Chamar Tohiya Pond at km 1+700 (LHS), Pond at km 1+900 (LHS), Laxminya Jalkat at km 6+200 (LHS), Baghmata River (Maa Katyani Mandir) at km 9+700 (LHS), Pond at km 11+000 (LHS), Pond at km 11+100 (LHS), Kath Puliya (Part Koshi river) at km 12+000 (LHS), Koshi River at km 13+700 (LHS), Pond at km 0+300 (RHS), Baghmata River at km 6+600 (RHS), Khar Bitta at km 7+700 (RHS) and Baghmata River at km 8+900 (RHS). | MI: Presence /absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit | Field observation | Included in civil works cost | Contractor | BSRDCL /CSC |
| 4.5 Deterioration in Surface water quality due to leakage from vehicles and equipment's and waste from construction camps. | <ul style="list-style-type: none"> Parking and refueling away from water bodies/waterways Oil/ grease trap and refueling platforms to be provided at refueling locations. Chemicals and fuel shall be stored away from water on concrete platform with catchment for spills collection. All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand, written in the local language emergency response procedure, including reporting, will be provided by the contractors. Construction camp to be sited away from water bodies. | The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof. | Pond at km 0+300 (LHS), Chamar Tohiya Pond at km 1+700 (LHS), Pond at km 1+900 (LHS), Laxminya Jalkat at km 6+200 (LHS), Baghmata River (Maa Katyani Mandir) at km 9+700 (LHS), Pond at km 11+000 (LHS), Pond at km 11+100 (LHS), Kath Puliya (Part Koshi river) at km 12+000 (LHS), Koshi River at km 13+700 (LHS), Pond at km 0+300 (RHS), Baghmata River at km 6+600 (RHS), Khar Bitta at km 7+700 (RHS) and Baghmata River at km 8+900 (RHS). | MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards | Conduction of water quality tests as per the monitoring plan Field observation | Included in civil works cost | Contractor | BSRDCL /CSC |

| Environment all Issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|--|---|--|---|---|------------------------------|---|
| | | | | | | | Implementation | Supervision |
| | <ul style="list-style-type: none"> Wastes must be collected, stored and taken to approved disposal site only. Water quality shall be monitored | | | prescribed by CPCB | | | | |
| 5. Flora and Fauna | | | | | | | | |
| 5.1 Road side Plantation Strategy | <ul style="list-style-type: none"> The Contractor shall do turfing on embankment slopes, plantation of shrubs as specified in the Contract. The compensatory plantation shall be carried out by the State Forest Department. Minimum 80 percent survival rate of the saplings shall be acceptable otherwise the Contractor/Forest Department shall replace dead plants at his own cost. The Environmental Specialist of CSC shall inspect regularly the survival rate of the trees planted by the Contractor in accordance with the plantation strategy suggested. | As per the contract document and MoRTH 301.3.3 | Throughout the length of project corridor | <p><u>MI</u>: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted.</p> <p><u>PT</u>: Survival of Compensatory Plantation @ 80% and Additional plantation @ 80% done on Tirhut model</p> | Review of relevant documents – tree cutting permit, compensatory plantation plan and key informants on Tirhut model of plantation Field observations | Additional plantation and compensatory plantation cost is included in project costs under BSRDCL. | Contractor | Environmental Specialist of CSC, BSRDCL |
| 5.2 Damage to Flora and chance found Fauna | <ul style="list-style-type: none"> The Contractor shall take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal. If any animal is found near the construction site at any point of time, the contractor shall immediately upon discovery thereof acquaint in the Environmental Specialist of CSC and carry out his instructions for dealing with the same. Environmental Specialist of CSC shall report to the nearby forest office | Wildlife Protection, Act and EMP and Bid | Throughout project corridor especially near forest stretches including surface water bodies | <p><u>MI</u>: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted.</p> <p><u>PT</u>: Survival of Compensatory Plantation @ 80% and Additional plantation @ 80% done on</p> | Visual observation and record checking | Included in civil works cost | Contractor | Environmental Specialist of CSC, BSRDCL |

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| Environment all Issue/ Component | Remedial Measure | Referencetol aws/guidelin e | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|--|--------------------------------|--|--|------------------------------|---------------------------------|---|
| | | | | | | | Implementa tion | Supervisi on |
| | (Range office or Divisional office) and shall take appropriate steps/measures, if required in consultation with the forest officials. | | | Tirhut model | | | | |
| 6. Construction Camps/sites Management and Occupational Health and Safety | | | | | | | | |
| 6.1 Impact associated with location | <ul style="list-style-type: none"> Contractor shall follow all relevant provisions of the Building and the other Construction Workers (Regulations of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp. The location, layout and basic facility provision of each labour camp shall be submitted to CSC and BSRDCL prior to their construction. The Construction shall commence only upon the written approval of the Environmental Specialist of CSC. The Contractor shall maintain necessary living accommodation and ancillary facilities in functional and hygienic manner and as approved by the CSC. | The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996 | All construction camps | MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is less than 500m from listed locations | On site observation Interaction with workers and local community | Included in civil works cost | Contractor and EO | BSRDCL /CSC |
| 6.2 Potable Water | <ul style="list-style-type: none"> The Contractor shall construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. The Contractor shall also provide potable water facilities within the premises of every camp at an accessible place, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. The Contractor shall also guarantee the following: <ul style="list-style-type: none"> Supply of sufficient quantity of Potable Water (as per IS) in every | The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996 | Construction site, Labour camp | MI: Provision of potable water PT: Storage of water having sufficient capacity. Complaints of bad water quality by workers | Visual observation of maintenance of the facilities. Water quality test report | Included in civil works cost | Contractor | Environmental Specialist of CSC, BSRDCL |

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| Environment all Issue/ Component | Remedial Measure | Reference laws/ guideline | Location/ Nos./ sections | Monitoring indicators (MI/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|---|--------------------------------|--|-----------------------------|------------------------------|---------------------------------|---|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>workplace/labour camp (Site at suitable and easily accessible places and regular maintenance of such facilities.</p> <ul style="list-style-type: none"> If any water storage tank is provided that shall be kept such that the bottom of the tank at least 1 m above the surrounding ground level. If water is drawn from any existing well, which is within 30 m proximity of any toilet, drain or other source of pollution, the well shall be disinfected before water is used for drinking. All such wells shall be entirely covered and provided with a trap door, which shall be dust proof and water proof. A reliable pump shall be fitted to each covered well. The trap door shall be kept locked and opened only for cleaning or inspection, which shall be done at least once in a month. Analysis of water shall be done every month as per parameters prescribed in IS 10500-1991. Environmental Specialist of CSC shall be required to inspect the labour camp once in a week to ensure the compliance of the EMP. | | | | | | | |
| 6.3 Sanitation and Sewage System | <p>The Contractor shall ensure that –</p> <ul style="list-style-type: none"> The sewage system for the camp is designed, built and operated in such a manner that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place Separate toilets/ bathrooms, wherever required, screened from those form men (marked in vernacular) are to be provided for women Adequate water supply is to be | <p>The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996 MoRTH:114.1</p> | Labour camps | <p>MI: Provision toilets and bathroom units and septic tank with soak pits and drainage networks PT: No discharge outside the camp area.</p> | Visual observation of site. | Included in civil works cost | Contractor | Environmental Specialist of CSC, BSRDCL |

| Environment all issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|---|---|-------------------------|---|---|-------------------------------|------------------------------|---|
| | | | | | | | Implementation | Supervision |
| | <p>provided in all toilets and urinals</p> <ul style="list-style-type: none"> Night soil can be disposed of with the help of local municipal extractor or disposed of by putting layer of it at the bottom of a permanent tank prepared for the purpose and covered with 15 cm layer of waste or refuse and then covered with a layer of earth for fortnight. | 4 | | Zero complaints from surrounding population. Zero water borne diseases in camp site | | | | |
| 6.4 Waste Disposal | <ul style="list-style-type: none"> The Contractor shall provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Environmental Specialist of CSC. | Annexure to M.O.R.H Clause 101 and The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996 | Camp site | MI: Number and capacity of Dust bins PT: No disposal outside the camp area. Zero complaints from surrounding population. | Visual observation at site. | Included in civil works cost | Contractor | Environmental Specialist of CSC, BSRDCL |
| 6.5 Worker's Health in construction camp/construction sites | <ul style="list-style-type: none"> The Contractor will provide preventive medical facilities in camp Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste. The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. No liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. Awareness raising to immigrant workers/local community on | The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act, 1974 and | All construction camps | MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero | Camp records Site observation Consultation with contractor workers and local people living nearby | Part of the civil works costs | Contractor | BSRDCL /CSC |

| Environment all Issue/ Component | Remedial Measure | Reference laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|--|--|---------------------------------|--|---|-------------------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>communicable and sexually transmitted diseases.</p> <ul style="list-style-type: none"> All necessary fencing and lights will be provided to protect the public in construction zones. All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the „Engineer“. Readily available First Aid Kits will all the essential first aid items will be maintained at camp site, construction site, plant site and other site of activities. | <p>ements thereof</p> | | <p>cases of STD. Clean and tidy camp site conditions.</p> | | | | |
| 7. Management of Construction Waste/Debris | | | | | | | | |
| 7.1 Selection of Dumping Sites | <ul style="list-style-type: none"> Contractor to submit a waste/spoil disposal plan and get it approved by CSC and EA. Create controlled dumping sites with a non-permeable lining incorporated in the pit design to avoid leachate seepage into the soil, which may later affect ground water quality Unproductive wastelands shall be selected for dumping sites away from residential areas and water bodies Dumping sites must be having adequate capacity equal to the amount of debris generated. <p>Public perception and consent from the village Panchayats has to be obtained before finalizing the location.</p> | <p>Design Requirement, MORT&H guidelines and General Conditions of Contract Document</p> | At all Dumping/Disposal Sites | <p>MI: Location of dumping sites Number of public complaints.</p> <p>PT: No public complaints. Consent letters for all dumping sites available with contractor</p> | Field survey and interaction with local people. Review of consent letter | Included in civil works cost. | Contractor. | BSRDCL /CSC |
| 7.2 Reuse and Disposal of | <ul style="list-style-type: none"> The existing bitumen surface shall be utilized for paving of cross roads, | <p>Design Requirement, MORT&H</p> | Throughout the project corridor | <p>MI: Percentage of reuse of existing surface</p> | Contractor records | Included in civil works cost. | Contractor. | BSRDCL /CSC |

| Environment all Issue/ Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|--|-------------------------|--|---|---------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| construction and dismantled waste | <p>access roads, and paving works in construction sites and camps temporary traffic diversions, and haulage routes.</p> <ul style="list-style-type: none"> All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. The removal of debris, wastes and its disposal, MORTH guidelines should be followed. Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site. The disposable debris may be utilized for following purposes: <ul style="list-style-type: none"> For filling and leveling of School grounds and proposed parking areas. The sub-grade of the existing pavement shall be used as embankment fill material. Existing base and sub-base material shall be recycled as sub-base of the haul road or access roads. The existing bitumen surface may be utilized for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage | guidelines and General Conditions of Contract Document | | <p>material</p> <p>Method and location of disposal site of construction debris</p> <p>PT: No public complaint and consent letters for all dumping sites available with contractor or CSC</p> | <p>Field observation</p> <p>Interaction with local people</p> | | | |

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| Environment all Issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---------------------------------|---|------------------------------|-------------------------|---|--------------------|------------------|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | <p>routes etc.</p> <ul style="list-style-type: none"> The Contractor shall suitably dispose off unutilized debris materials either through filling up of borrows areas located in wasteland or at pre-designated disposal locations, subject to the approval of the Environmental Expert of CSC. At locations identified for disposal of bituminous wastes, the disposal shall be carried out over a 30 mm thick layer of rammed clay so as to eliminate the possibility of scarified percolation of leachate into the ground water. The Contractor shall ensure that the surface area of such disposal pits is covered with a layer of soil and subsequently turfing. All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, shall be considered incidental to the work and shall be planned and implemented by the Contractor as approved and directed by the Environmental Expert of CSC. The pre-designed disposal locations shall be a part of Waste Disposal Plan in consultation and with approval of Environmental Expert of CSC. Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or for mud puddles in the area. All waste materials shall be completely disposed and the site shall be completely cleaned and certified by | | | | | | | |

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| Environment all Issue/ Component | Remedial Measure | Reference laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|---|---|--|--|---|-------------------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | Environmental Specialist of CSC before handing over. <ul style="list-style-type: none"> The Contractor at his cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise on account of lack of action on his part. | | | | | | | |
| 8. Traffic Management and Safety | | | | | | | | |
| 8.1 Management of existing traffic and safety | <ul style="list-style-type: none"> Traffic Management Plan shall be submitted by the contractor and approved by the CSC. The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Timing and scheduling to be done so that transportation of dangerous goods is done during least number of people and other vehicles on the road. The Contractor shall take all necessary measures for the safety of traffic during construction and provide erect and maintain such barricades, including signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan Drawings and as required by the Environmental Expert of CSC for the information and protection on traffic approaching or passing through the section of any existing cross roads. The Contractor shall ensure that all signs, barricades, pavement markings are provided as per the MoRTH specifications. The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during | Design requirement and IRC: SP 27 - MoRTH: 112.1 IRC: SP:55-2014 Bid Document | Throughout the project corridor especially at intersections and settlements. | <u>MI</u> : Traffic management plan. Presence/absence of safety signs, traffic demarcations, flag men etc. on site. Complaints from road users. <u>PT</u> : No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site | Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road | Included in civil works cost. | Contractor | BSRDCL /CSC |

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Section-6: EMP

| Environment all Issue/Com ponent | Remedial Measure | Referencetol aws/guidelin e | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|-----------------------------------|---|--|--|-------------------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>the monsoon to avoid disruption to traffic flow.</p> <ul style="list-style-type: none"> On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. Restriction of construction activity to only one side of the existing road The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". Use of adequate signage's to ensure traffic management and safety. Conduct of regular safety audit on safety measures. | | | | | | | |
| 8.2 Pedestrian , animal movement | <ul style="list-style-type: none"> Temporary access and diversion, in proper drainage facilities. Access to the schools, temples and other public places must be maintained when construction takes place near them. Fencing wherever cattle movement is expected. Large number of box and slab culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals | Same as above | Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites. | <p><u>MI</u>: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people</p> <p><u>PT</u>: Easy access to schools, temples and public places. Zero complaints</p> | Field observation Interaction with local people | Included in civil works cost. | Contractor | BSRDCL /CSC |
| 8.3 Safety of Workers and accident risk from construction activities | <ul style="list-style-type: none"> Contractors to adopt and maintain safe working practices. Contractor shall provide: Protective footwear, protective goggles and nose masks to the workers employed in asphalt works, concrete works, crusher etc. | Same as above | Construction sites | <p><u>MI</u>: Availability of Safety gears to workers</p> <p>Safety signage Training records on</p> | <p>Site observation</p> <p>Review records on safety training and</p> | Included in civil works cost | Obligation of Contractor | BSRDCL /CSC |

| Environment all Issue/Com ponent | Remedial Measure | Referencetol aws/guidelin e | Location/Nos./ sections | Monitoring indicators (MI/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|-----------------------------------|-------------------------|--|---|---------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <ul style="list-style-type: none"> Welder's protective eye-shields to workers who are engaged in welding works Earplugs to workers exposed to loud noise, and workers working in crushing or compaction The Contractor shall comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. The Contractor shall comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organization (ILO) Convention No. 62 as far as those are applicable to this contract. The Contractor shall make sure that during the construction work all relevant provisions of Building and other Construction Workers Regulation of Employment and Conditions of Services) Act, 1996 are adhered to. The Contractor shall not employ any person below the age of 18 years for any work and no woman shall be employed in the work of painting with products containing lead in any form The contractor shall also ensure that paint containing lead or lead products is used except in the form of paste or readymade paint. Usage of fluorescent and retro refractory signage, in local language at the construction sites Training to workers on safety procedures and precautions. Appointment of a safety officer. | | | safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents. | accidents Interact with construction workers | | | |

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| Environment all Issue/Component | Remedial Measure | Referencetolaws/guideline | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--------------------------------------|--|---|---|--|--|------------------------------|------------------------------|---|
| | | | | | | | Implementa tion | Supervisi on |
| | <ul style="list-style-type: none"> All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. Provision of readily available first aid unit including an adequate supply of dressing materials. Use of hazardous material should be minimized and/or restricted. Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or emergencies. Accident Prevention Officer must be appointed by the contractor. | | | | | | | |
| 8.4 Risk from electrical equipment's | <ul style="list-style-type: none"> The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that: No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public. All necessary fencing and lights shall be provided to protect the public in construction zones. All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Environmental Expert of CSC. | Contract Agreement and Annexure 'A' to MoRTH Clause 501, The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996 and Factories Act, 1948 | Throughout construction zones, plant sites and camp site and storage areas, DG sets | MI: Electric connections/ wiring system Number of safety related accidents PT: Zero accidents. | Visual observation of electric connections | Included in civil works cost | Contractor | Environmental Specialist of CSC, BSRDCL |
| 8.5 Accident in local community | <ul style="list-style-type: none"> Restrict access to construction sites only to authorized personnel. Physical separation must be provided | Same as above | Construction sites and Accident-Prone Area | MI: Safety signs and their location | Site inspection | Included in civil works cost | Contractor | BSRDCL /CSC |

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| Environment all issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|--|---|---|---|--|-------------------------------|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | for movement of vehicular and human traffic. <ul style="list-style-type: none"> All measures for the safety of traffic during construction viz. signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan/Drawings shall be taken. Provision of temporary diversions and awareness to locals before opening new construction fronts. Alternate access facility to common properties near construction zones Fencing and speed limitation wherever cattle movement is anticipated. | | | Incidents of accidents Complaints from local people PT: Zero incident of accidents. Zero complaints. | Consultation with local people | | | |
| 8.6 Risk force measure | <ul style="list-style-type: none"> Contractor shall take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities. Contractor shall make required arrangements so that in case of any mishap all necessary steps can be taken for prompt first aid treatment. Construction Safety Plan prepared by the Contractor shall identify necessary actions in the event of an emergency. | Contract Agreement and Annexure 'A' to MoRTH Clause 501 | At all activities areas Throughout the construction phase | MI: Development of Emergency Response system and emergency preparedness Complaints from local people PT: Zero incidents | Documents on Emergency Response System/ Record of Mock Drilling record of regular checking's | Included in civil works cost | Contractor | CSC/ BSRDCL |
| 9. 9. Site Restoration and Rehabilitation | | | | | | | | |
| 9.1 Clean-up Operations, Restoration and Rehabilitation | <ul style="list-style-type: none"> Contractor shall prepare site restoration plans, which shall be approved by the Environmental Specialist of CSC. The clean-up and restoration operations are to be implemented by the Contractor prior to demobilization. The Contractor shall clear all temporary structures; dispose all garbage, night soils and POL (Petroleum, Oil and Lubricants) wastes as per | Project requirement | Throughout the project corridor, construction camp sites and borrow areas | MI: camp, Condition borrows areas and construction sites, Presence/absence of construction debris after | Site observation Interaction with locals Issue completion certificate after | Included in civil works cost. | Contractor | BSRDCL /CSC |

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| Environment all Issue/ Component | Remedial Measure | Reference laws/guideline | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|---|--|--|-----------------------------|---|---|-------------------------------|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | <p>Comprehensive Waste Management Plan and as approved by CSC.</p> <ul style="list-style-type: none"> All disposal pits or trenches shall be filled in and effectively sealed off. Residual topsoil, if any shall be distributed on adjoining/proximate barren land or areas identified by the Contractor and approved by the Environmental Specialist of CSC in a layer of thickness of 75 mm – 150 mm. All construction zones and facilities including culverts, road side areas, camps, Hot Mix plant sites, Crushers, batching plant sites and any other area used/affected due to the project operations shall be left clean and tidy at the Contractor's expense, to the entire satisfaction to the Environmental Specialist of CSC. | | | <p>construction works is over</p> <p>PT: Clean and tidy sites. No trash or debris left on site. Site restored/leveled</p> | <p>restoration of all sites is found satisfactory</p> | | | |
| 10. Impact on Cultural and Archaeological Features | | | | | | | | |
| 10.1 Chance Found Archaeological Property | <ul style="list-style-type: none"> All fossils, coins, articles of value of antiquity, structures and other remains of archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. The Contractor shall take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He shall, immediately upon discovery thereof and before removal acquaint the Environmental Specialist of CSC of such discovery and carry out the CSC's instructions for dealing with the same, waiting which all work shall be stopped. The CSC shall seek direction from the | The Ancient Monuments and Archaeological Sites and Remains Act, 1958 | Throughout project corridor | <p>MI: Identification of Archaeological features during excavation activities</p> <p>PT: Intimation to CSC and Respective Department.</p> | Photographic records and visual observation at site | Included in civil works cost. | Contractor | BSRDCL /CSC |

Section-6: EMP

| Environment all Issue/Com ponent | Remedial Measure | Referencetol aws/guidelin e | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|---|--|--|---|---|---------------------------------|-----------------|
| | | | | | | | Implementa tion | Supervisi on |
| | Archaeological Survey of India (ASI) before instructing the Contractor to recommence the work in the site. The Archaeological structures identified along the road sides should be protected/ preserved or enhanced as per the law. | | | | | | | |
| C. OPERATION AND MAINTENANCE STAGE | | | | | | | | |
| 1. Performance Monitoring of Proposed Development | | | | | | | | |
| 1.1 Monitoring Operation Performance | <ul style="list-style-type: none"> The BSRDCL shall monitor the operational performance of the various mitigation/enhancement measures carried out as a part of the project. The indicators selected for monitoring include the survival rate of trees; utility of enhancement provision made under the project; status of rehabilitation of borrow areas and effectiveness of noise barriers. | As per the contract document | Throughout the project corridor | | | | BSRDCL | BSRDCL |
| 2. Pollution Monitoring | | | | | | | | |
| 2.1 Pollution Monitoring | <ul style="list-style-type: none"> The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil quality in the selected locations as suggested in pollution monitoring plan through the BSPCB or its approved monitoring agency. | Environmental Protection Act, 1986 and The noise pollution (regulation and control) rules, 2000 | At representative locations as per the instructions of Env. Engineer | <u>MI</u> : Test results of environmental attributes of air, water, noise and soil <u>PT</u> : No parameters exceed the standard limits and levels are equal or below the baseline data | Environmental monitoring and test reports | As per Environmental Monitoring Cost Included in Operation/Maintenance cost | Pollution Monitoring Agency | BSRDCL |
| 3. Air Quality | | | | | | | | |
| 3.1 Air | <ul style="list-style-type: none"> Compensatory tree plantations shall be | Environmental | Throughout the Corridor | <u>MI</u> : Ambient air | As per | Included in | BSRDCL | |

| Environment Issue/Component | Remedial Measure | Reference laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--------------------------------------|--|---|---|--|--|--|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| pollution due to vehicular movement | <p>maintained as prescribed by forest department.80% survival rate for additional plantation shall be maintained as per Tirhut model</p> <ul style="list-style-type: none"> Regular maintenance of the road will be done to ensure good surface condition Ambient air quality monitoring. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. Signages shall be provided reminding the drivers/road users to properly maintain their vehicles to economize on fuel consumption. Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipment's | Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 | | <p>quality (PM₁₀, CO,SO₂ NO₂)</p> <p><u>PT</u>: Levels are equal to or below baseline levels (Air Quality Standard, CPCB)</p> | <p>CPCB requirements</p> <p>Site inspection</p> | Operation/Maintenance cost | | |
| 2. 4. Noise Pollution | | | | | | | | |
| 4.1 Noise due to movement of traffic | <ul style="list-style-type: none"> Effective traffic management and good riding conditions shall be maintained Speed limitation and honking restrictions near sensitive receptors. Construction of noise barriers near sensitive receptors with consent of local community The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road. | Noise Pollution (Regulation and Control) Rules,2000and amendments thereof | <p>Sensitive receptors as given in supplementary table to EMP.</p> <p>Noise barriers at Schoolsat km 5+400 (LHS) and km 13+100 (LHS).</p> | <p><u>MI</u>: Noise levels</p> <p><u>PT</u>: Levels are equal to or below baseline levels (Noise Quality Standard, CPCB)</p> | <p>Noise monitoring as per noise rules ,2000</p> <p>Discussion with people at sensitive receptor sites</p> | Included in Operation/Maintenance cost | | BSRDCL |

| Environment Issue/Component | Remedial Measure | Reference laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|---|--|--|--|---|---|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| 5. Land and Soil | | | | | | | | |
| 5.1 Soil Erosion and Monitoring of Borrow Areas | <ul style="list-style-type: none"> Visual Monitoring and inspection of soil erosion at borrow areas, quarries (if closed and rehabilitated), embankments and other places expected to be affected, shall be carried out once in every three months as suggested in monitoring plan. to assess the effectiveness of the stabilization measures viz. turbing, stone pitching, river training structures etc. Necessary measures to be followed wherever there are failures Necessary measures to be followed wherever there are failures | MoRTH 305.2.2.2 and 306. Project requirement | Borrow areas and embankment slopes | <p><u>MI</u>: observed Erosion</p> <p><u>PT</u>: No erosion. suitable erosion control measures to be provided immediately once it is noticed</p> | <p>Visual observation especially after monsoon</p> <p><u>MI</u>: Existence of soil erosion sites Number of soil erosion sites</p> <p><u>PT</u>: Zero or minimal occurrences of soil erosion</p> | As per Environmental Monitoring Cost Included in Operation/Maintenance cost | BSRDCL | BSRDCL |
| 6. Siltation/Water-logging | | | | | | | | |
| 6.1 Siltation/Contamination | <ul style="list-style-type: none"> Regular visual checks shall be made to observe any incidence of blockage of drains. Regular checks shall be made for soil erosion Monitoring of surface water bodies | Project requirement | Near surface Water bodies | <p><u>MI</u>: Water quality</p> <p><u>PT</u>: No turbidity of surface water bodies due to the road</p> | Site observation | Included in Operation/Maintenance cost | BSRDCL | BSRDCL |
| 6.2 Water logging due to blockage of drains, culverts or streams | <ul style="list-style-type: none"> BSRDCL shall ensure that all drains (side drains, median drain and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding Regular visual checks and cleaning (at least once before monsoon) of drains to ensure that flow of water is maintained through cross drains and other channels/streams. | Project requirement IRC: SP:21-2009 | All the CD structures near surface Water bodies/cross drains/side drains | <p><u>MI</u>: Presence/absence of water logging along the road</p> <p><u>PT</u>: No record of overtopping/Water logging</p> | Site observation | Included in Operation/Maintenance cost | BSRDCL | BSRDCL |

| Environment all Issue/Component | Remedial Measure | Reference laws/guideline | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|--|--|--|-------------------------------|--|--|--|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | <ul style="list-style-type: none"> Monitoring of waterborne diseases due to stagnant water bodies | | | | | | | |
| 7. Flora | | | | | | | | |
| 7.1 Vegetation | <ul style="list-style-type: none"> Planted trees, shrubs, and grasses to be properly maintained. The tree survival audit to be conducted at least once in a year to assess the effectiveness | Forest Conservation Act 1980 | Project tree plantation sites | <p><u>MI</u>: Tree/plants survival rate</p> <p><u>T</u>: Minimum rate of 80% tree survival</p> | Records and field observations. Information from Forestry Department | Included in Operation/Maintenance cost | BSRDCL/NGO/ADB | BSRDCL |
| 8. Maintenance of Right of Way and Safety | | | | | | | | |
| 8.1 Accident Risk due to uncontrolled growth of vegetation | <ul style="list-style-type: none"> Maintain shoulder completely clear of vegetation. Minimum offset as prescribed in IRC:SP:21-2009 to be maintained Regular maintenance/trimming of plantation along the roadside No invasive plantation near the road. | Prote... requirement IRC: SP:21-2009 | Throughout the Project route | <p><u>MI</u>: Presence and extent of vegetation growth on either side of road. Number of accidents.</p> <p><u>PT</u>: No accidents due to vegetation growth</p> | Visual inspection Check accident records | Included in Operation/Maintenance cost | BSRDCL | BSRDCL |
| 8.2 Accident risks associated with traffic movement. | <ul style="list-style-type: none"> Traffic control measures, including speed limits, will be enforced strictly. Further encroachment of squatters within the ROW will be prevented. No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law Monitor/ensure that all safety provisions included in design and construction phase are properly maintained Highway patrol unit(s) for round the clock patrolling. Phone booth for accidental reporting and ambulance services with minimum response time | IRC:SP:55-2014. IRC:67-2010 Project Design | Accident Prone Areas | <p><u>MI</u>: Number of accidents</p> <p>Conditions and existence of safety signs, rumble strips etc. on the road</p> <p>Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant</p> | Review accident records Site observations | Included in Operation/Maintenance cost | BSRDCL | BSRDCL |

Section-6: EMP

| Environment all Issue/Component | Remedial Measure | Reference to laws/guidelines | Location/Nos./ sections | Monitoring indicators (MI)/ Performance Target (PT) | Monitoring Methods | Mitigation Costs | Institutional Responsibility | |
|-----------------------------------|--|------------------------------|--------------------------------|--|--|--|------------------------------|-------------|
| | | | | | | | Implementation | Supervision |
| | for rescue of any accident victims, if possible. <ul style="list-style-type: none"> Tow-way facility for the breakdown vehicles if possible. | | | local law PT: Fatal and non-fatal accident rate is reduced after improvement | | | | |
| 8.3. Transport of Dangerous Goods | <ul style="list-style-type: none"> Existence of spill prevention and control and emergency responsive system Emergency plan for vehicles carrying hazardous material | - | Throughout the project stretch | MI: Status of emergency system – whether operational or not PT: Fully functional emergency system | Review of spill prevention and emergency response plan Spill accident records | Included in Operation/Maintenance cost | BSRDCL | BSRDCL |

ADB: Asian Development Bank, BSRDCL: Bihar State Road Development Corporation Ltd., EA: Executing Agency, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, CGWA: Central Groundwater Authority, CBR: California Bearing Ratio, DEIAA: District Environmental Impact Assessment Authority, EMP: Environmental Management Plan, EMOP: Environmental Monitoring Plan. EO: Environmental Officer, IRC: Indian Road Congress, MOEFCC: Ministry of Environment, Forests and Climate Change, MORTH: Ministry of Road Transport and Highways, NGO: Non-Governmental Organization, RP: Resettlement Plan

The “Project engineer” or “the engineer” is the team of Construction Supervision Consultants (CSC) responsible for approving the plans, engineering drawing, release of payments to contractor etc. on behalf of the employer (BSRDCL). It is usually the team leader of the CSC that takes the responsibility of signing approval documents on behalf of the CSC team. The “environmental officer” is the environmental specialist under the CSC who is responsible for providing recommendations to the CSC team leader for approving activities specific to environment safeguards on behalf of “the engineer”.

Supplementary Tables to EMP

Noise Sensitive Receptors and Proposed Noise Barriers

| S. No | Chainage (km) | Name of Noise Sensitive Receptors | Side | Dist. of Boundary wall from PCL (m) | Dist. of Main structure from PCL (m) | Proposed Noise Barrier (m) |
|--|---------------|-----------------------------------|------|-------------------------------------|--------------------------------------|----------------------------|
| 1. | 1+100 | Primary Health Centre Sub Center | LHS | No wall | 40 | N/A |
| 2. | 5+400 | Middle School, Jhamta | LHS | No wall | 11 | 12 |
| 3. | 13+100 | Middle School, Srinagar Dhamhara | LHS | 6 | 9 | 65 |
| 4. | 6+100 | Middle School, Balha Shedpur | RHS | 10.8 | 13 | N/A |
| Total proposed Noise Barrier (Running Meter) | | | | | | 77 |

Water Bodies likely to be Affected along Project Road

| S. No. | From Ch. | To Ch. | Dist. from PCL (m) | Name of water bodies | Type | Side | Nature | Usage |
|--------|----------|--------|--------------------|-------------------------------------|-------|------|---------------|--|
| 1. | 0+200 | 0+300 | 4 | Pond | Pond | LHS | Non perennial | Domestic, Cattle bathing, fishing, agriculture |
| 2. | 1+600 | 1+700 | 9.5 | Chamar Tohiya Pond | Pond | LHS | Non perennial | Domestic, fishing, Agriculture |
| 3. | 1+800 | 1+900 | 2 | Pond | Pond | LHS | Non perennial | Fishing |
| 4. | 6+100 | 6+200 | 8 | Laxminya Jalkat | River | LHS | Perennial | Domestic, Cattle bathing, fishing, agriculture |
| 5. | 9+600 | 9+700 | 0 | Baghmati River (Maa Katyani Mandir) | River | LHS | Perennial | Domestic, Cattle bathing, fishing, agriculture |
| 6. | 10+900 | 11+000 | 25 | Pond | Pond | LHS | Non perennial | Cattle bathing, Agriculture |
| 7. | 11+000 | 11+100 | 5 | Pond | Pond | LHS | Non perennial | Domestic, Cattle bathing, fishing, agriculture |
| 8. | 11+900 | 12+000 | 0 | Kath Puliya (Part of Koshi river) | River | LHS | Non perennial | Domestic, Cattle bathing, fishing, agriculture |
| 9. | 13+300 | 13+700 | 0 | Koshi River | River | LHS | Perennial | Domestic, Cattle bathing, fishing, agriculture |
| 10. | 0+200 | 0+300 | 5 | Pond | Pond | RHS | Non perennial | Domestic, Cattle bathing, fishing, agriculture |
| 11. | 6+100 | 6+600 | 6 | Baghmati | River | RHS | Perennial | Domestic, Cattle bathing, fishing, agriculture |
| 12. | 7+600 | 7+700 | 0 | Khar Bitta | Canal | RHS | Non perennial | Domestic, Cattle bathing, fishing, agriculture |
| 13. | 8+700 | 8+900 | 0 | Baghmati | River | RHS | Perennial | Domestic, Cattle bathing, fishing, agriculture |

1.1 Performance Indicators

Environmental components identified of a particular significance in affecting the environment at critical locations have been suggested as performance indicators (PIs) and is given in **following Table:**

Performance Indicators and Monitoring Plan

| S. No | Monitoring plan/ Performance Indicators | Description of Item | Indicator | Stage | Responsibility |
|-------|--|---|--------------------------------------|--|------------------------------|
| 1 | Monitoring plan | <ul style="list-style-type: none"> No. of trees planted (Total) No. of trees under Compensatory Afforestation No. of Trees planted along Road sides | Road side and other plantation areas | Post construction stage | Forest Department and BSRDCL |
| 3 | Performance indicators | <ul style="list-style-type: none"> No. of Borrow Areas identified and verified No. of sites for which restoration plans have been prepared No. of sites restored and rehabilitated No. of sites handed over | Borrow Area | Pre -Construction and Post- Construction | Contractor & BSRDCL |
| 4 | Performance indicators | <ul style="list-style-type: none"> No. of Quarry Areas identified and verified No. of sites for which restoration plans have been prepared No. of sites restored and rehabilitated No. of sites handed over | Quarry | Pre -Construction and Post Construction | Contractor & BSRDCL |
| 5 | Performance indicators | <ul style="list-style-type: none"> Quantity of Debris and spoils to be disposed off No. of locations finalized for Debris disposal Quantity of Debris and spoils disposed off No. of locations for which Rehabilitation works have been completed | Disposal sites | Construction and Post Construction | Contractor & BSRDCL |
| 6 | Performance indicators | <ul style="list-style-type: none"> No. of locations identified for the construction camp and construction plant sites No. of locations approved | Construction camps and plant sites | Pre- construction and Post Construction | Contractor & BSRDCL |

Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95) in the State of Bihar on EPC Mode

Section-6: EMP

| S. No | Monitoring plan/ Performance Indicators | Description of Item | Indicators | Stage | Responsibility |
|-------|--|---|--|------------------------------------|--|
| | | <ul style="list-style-type: none"> • Lay-outs approved • No. of sites for which site Restoration and Rehabilitation has been completed | | | |
| 7 | Performance indicators | <ul style="list-style-type: none"> • No. of Trees to be cut • No. of Trees cut • % Progress on the tree removal | Tree-cutting | Pre construction | BSRDCL |
| 8 | Performance indicators | <ul style="list-style-type: none"> • No. of locations identified for temporary storage of the excavated materials to be used in embankment and sub grade | Storage of excavated materials | Pre construction and construction | Contractor |
| 9 | Monitoring plan | <ul style="list-style-type: none"> • Statutory environmental monitoring as per the conditions stipulated in the consents/ permission issued by PCB | Environmental status at construction Sites | Construction | Contractor |
| 10 | Monitoring plan | <ul style="list-style-type: none"> • Environmental parameter monitoring in accordance with the frequency and duration of monitoring as well as the location as per the Monitoring plan. | Air, Noise, Soil and Water quality | Construction and Operation | Contractor/ BSRDCL through external agency |
| 11 | Monitoring plan | <ul style="list-style-type: none"> • Before the onset of monsoon all the debris excavated materials shall be removed from the work sites and disposed of at the pre-identified approved locations | Silting of water bodies | Construction | Contractor supervised by the Environmental specialist of CSC |
| 12 | Performance indicators | <ul style="list-style-type: none"> • Implementation of enhancement measures for • Parking areas • Cultural properties • Religious properties | Enhancements | Construction | Contractor |
| 13 | Performance indicators | <ul style="list-style-type: none"> • No. of Training sessions organized for • Department staff • Contractors • Combined • No. of people trained • Department staff • Contractors | Training Imparted | Construction and Operational Phase | BSRDCL |

Section-6: EMP

| S. No | Monitoring plan/ Performance Indicators | Description of Item | Indicators | Stage | Responsibility |
|-------|--|---|---|--------------------|----------------|
| 14 | Performance indicators | Slope protection measures • Length (by type) • No. of Locations | Work sites | Construction | Contractor |
| 15 | Performance indicators | Drainage • Length • No. of Locations | Work sites | Construction | Contractor |
| 16 | Performance indicators | Safety provisions • Signage (by type and No.) • Guard Rails • Guide Rails | Work sites | Construction | Contractor |
| 17 | Performance indicators | No. of chute drains provided | Work sites | Construction | Contractor |
| 18 | Performance indicators | Soil erosion prevention measures • Silt fencing (No. of locations and quantity) • Stone pitching (No. of locations and quantity) • Any other (grass seeding etc.) | Work sites | Construction | Contractor |
| 19 | Performance indicators | Utility ducts • Length provided • No. of Locations | Utility ducts | Construction | Contractor |
| 20 | Performance indicators | Water sources • No. of sources protected • No. of sources relocated | Work sites | Construction | Contractor |
| 21 | Performance indicators | No. of HIV awareness sessions conducted | Labours | Construction Stage | BSRDCL |
| 22 | Performance indicators | No. Safety awareness sessions conducted | Labours | Construction Stage | BSRDCL |
| 23 | Monitoring plan | No. of awareness sessions for educating the public about road safety and other environmental aspects (such as waste dumping, preservation of enhanced sites, pollution and health impacts etc.) | Public in the vicinity of project road. | Construction Stage | BSRDCL |

ENVIRONNEMENTAL MONITORING PLAN

Environmental Monitoring of Ambient Air, Water, Noise and Soil along the Project Road

| Environment Component | Project Stage | Regular Monitoring Parameters | | | | Institutional Responsibilities | | | | |
|-----------------------|---------------|--|--|--|--|--|---------------------|---|--|----------------------|
| | | Parameters | Standards | Method/ Guidelines | Locations | Frequency | Duration | Action Plan in case criteria exceeds | Implementation | Supervision |
| Ambient Air | Construction | PM ₁₀ µg/m ³ , PM _{2.5} µg/m ³ , SO ₂ , NO _x , CO | National Ambient Air Quality Standard (CPCB, 18 th Nov, 2009) | High volume sampler to be located 50 m from the selected locations in the downwind direction. Use method specified by CPCB | Plant site/ HMP/Stone Crusher/ (construction site)-Total 2 locations | Once in 3 month for 2 years excluding monsoon period) (No. of Samples = 3x2x2 =12) | Continuous 24 hours | Check and modify control device like bag filter/cyclones of hot mix plant | Contractor through approved NABL monitoring agency | EO of CSC and BSRDCL |
| | | PM ₁₀ µg/m ³ , PM _{2.5} µg/m ³ , SO ₂ , NO _x , CO | | High volume sampler to be located 50 m from the selected locations in the downwind direction. Use method specified by CPCB | Along the project roads at 2 locations in consultation with CSC. | Once in a season excluding the monsoon for 2 years (No. of Samples = 3x2x2 =12) | Continuous 24 hours | - | Contractor through approved NABL monitoring agency | EO of CSC and BSRDCL |
| | Operation | PM ₁₀ µg/m ³ , PM _{2.5} µg/m ³ , SO ₂ , NO _x , CO | | High volume sampler to be located 50 m from the selected locations in the downwind direction. Use method specified by CPCB | Along the project road at 2 locations in consultation with BSRDCL | In the interval of 4 months for 1 Year (No. of Samples = 3x2x1= 6) | Continuous 24 hours | - | BSRDCL through approved NABL monitoring agency | BSRDCL |

Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95) in the State of Bihar on EPC Mode

Section-6: EMP

| Environment Component | Project Stage | Regular Monitoring Parameters | | | | | Institutional Responsibilities | | | |
|-----------------------|---------------|---|--|---|--|--|--------------------------------|--|--|----------------------|
| | | Parameters | Standards | Method/ Guidelines | Locations | Frequency | Duration | Action Plan in case criteria exceeds | Implementation | Supervision |
| Surface Water Quality | Construction | pH, Temperature, DO, BOD, COD, Oil & Grease, Total Suspended Solid, turbidity, Total Hardness, Chlorine, Iron, Total Coliform | Freshwater Classification Criteria by CPCB for Propagation of Aquatic life | Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater | 2 locations along the project road | Once in 3 month for 2 years excluding monsoon period) (No. of Samples = 3x2x2 = 12) | Grab Sampling | Check and modify petrol interceptors, silt fencing devices | Contractor through approved NABL monitoring agency | EO of CSC and BSRDCL |
| | Operation | pH, Temperature, DO, BOD, COD, Oil & Grease, Total Suspended Solid, turbidity, Total Hardness, Chlorine, Iron, Total Coliform | | Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater | 2 locations identified by BSRDCL along the project roads | In the interval of 4 months for 1 Year (No. of Samples = 3x2x1 = 6) | Grab Sampling | Check and modify petrol interceptors, silt fencing devices | BSRDCL through approved NABL monitoring agency | BSRDCL |

| Environment Component | Project Stage | Regular Monitoring Parameters | | | | | Institutional Responsibilities | | | |
|------------------------|---------------|---|--|---|--|---|--------------------------------|--|--|----------------------|
| | | Parameters | Standards | Method/ Guidelines | Locations | Frequency | Duration | Action Plan in case criteria exceeds | Implementation | Supervision |
| Ground Water Quality | Construction | pH, Temperature, TSS, Total hardness, Suspended Solid, Chlorine, Iron, Sulphate, Nitrate | Ground Water Quality Standard as per IS: 10500, 1991 | Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater | Plant, Camp site & Contractor site (2 location) | Once in 3 month for 2 years excluding monsoon period) (No. of Samples = 3x2x2 = 12) | Grab Sampling | Check and modify petrol interceptors, silt fencing devices | Contractor through approved NABL monitoring agency | EO of CSC and BSRDCL |
| | Operation | pH, Temperature, TSS, Total hardness, Suspended Solid, Chlorine, Iron, Sulphate, Nitrate | | Grab sample collected from source and analyze as per standard Methods for Examination of Water and Wastewater | 1 location identified by BSRDCL along the roads (1 location) | In the interval of 4 months for 1 Year (No. of Samples = 3x1x1 = 3) | Grab Sampling | Check and modify petrol interceptors, silt fencing devices | BSRDCL through approved NABL monitoring agency | BSRDCL |
| Drinking water Quality | Construction | pH, Temperature, TSS, Total hardness, Suspended Solid, Chlorine, Sulphate, Nitrate, Total coliform, Faecal coliform | Drinking Water Quality standard by CPCB/IS:10500 | Grab sample collected from drinking water source at camp site and construction site | 2 location camp site and construction site | In the interval of 3 months for 2 Year (No. of Samples = 2x4x2 = 16) | Grab Sampling | Treatment of water/identification of alternate source | Contractor through approved NABL monitoring agency | BSRDCL |

Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95) in the State of Bihar on EPC Mode

| Environment Component | Project Stage | Regular Monitoring Parameters | | | | | Institutional Responsibilities | | | |
|-----------------------|---------------|--|-------------------------------------|---|---|--|---|--|--|----------------------|
| | | Parameters | Standards | Method/ Guidelines | Locations | Frequency | Duration | Action Plan in case criteria exceeds | Implementation | Supervision |
| Noise Level | Construction | Leq dB (A) (Day and Night) Average and Peak values | Ambient Noise Standard (CPCB, 2000) | IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968 Using Noise level meter | 1 location at plant site and 3 sensitive locations (school/ college/ hospital along the project road) during construction stage of the project road | Once in 3 month for 2 years excluding monsoon period) (No. of Samples = 4x3x2= 24) | Readings to be taken at 60 seconds interval for every hour and then Leq are to be obtained for Day time and Night time. | Check and modify equipment and devices used to attenuate noise level | Contractor through approved NABL monitoring agency | EO of CSC and BSRDCL |
| | Operation | Leq dB (A) (Day and Night) Average and Peak values | | IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968 Using Noise level meter | 2 Location as identified by BSRDCL | In the interval of 4 months for 1 Year (No. of Samples = 2x3x1= 6) | Readings to be taken at 60 seconds interval for every hour and then Leq are to be obtained for Day time and Night time. | - | BSRDCL through approved NABL monitoring agency | BSRDCL |

Section-6: EMP

| Environment Component | Project Stage | Regular Monitoring Parameters | | | | | | Institutional Responsibilities | | |
|---|---------------|---|------------------------|---|--|---|---------------|---|--|----------------------|
| | | Parameters | Standards | Method/ Guidelines | Locations | Frequency | Duration | Action Plan in case criteria exceeds | Implementation | Supervision |
| Soil | Construction | Physical Parameter: Texture, Grain Size, Gravel, Sand, Silt, Clay; Chemical Parameter: pH, Conductivity, Calcium, Magnesium, Sodium, Nitrogen, Absorption Ratio | - | As specified by the site engineer BSRDC / CSC | Near Construction sites along the road as identified by the EO, CSC (Location) | Once in 3 month for 2 years excluding monsoon period) (No. of Samples = 2x3x2= 12) | Grab sampling | - | Contractor through approved NABL monitoring agency | EO of CSC and BSRDCL |
| Tree Plantation/ Green belt Development | Construction | Tree Survival rate | 90% Tree Survival Rate | Visual checks and tree enumeration | Throughout the Project in substantially completed section | Once in a month | 2 Years | Replacement of Dead tree with healthy saplings of same species, repairing of tree guards, fencing | Contractor/Forest Department | EO of CSC and BSRDCL |
| | Operation | Tree Survival rate | 90% Tree Survival Rate | Visual checks and tree enumeration | Throughout the Project stretch | Once in three months | 3 years | Replacement of Dead tree with healthy saplings of same species | BSRDCL | BSRDCL |

Section-6: EMP

| Environment Component | Project Stage | Regular Monitoring Parameters | | | | | Institutional Responsibilities | | | |
|-----------------------|---------------|---|--|--------------------|---|--|--------------------------------|--|----------------|----------------------|
| | | Parameters | Standards | Method/ Guidelines | Locations | Frequency | Duration | Action Plan in case criteria exceeds | Implementation | Supervision |
| Water Bodies | Construction | Turbidity in Storm water Silt load in ponds/Rivers | As specified by the engineer Water quality standards | Visual Checks | At the drains, Ponds, water reservoir and River along the project road | Pre-monsoon and post monsoon seasons for 2 years | 2 years | Inspection and modification of silt fencing/ any leakage of drains to these surface water bodies | Contractor | EO of CSC and BSRDCL |
| | Operation | Turbidity in Storm water Silt load in ponds | As specified by the engineer/ Water quality standards | Visual Checks | At major water bodies (Pond, within the Proposed ROW and those located at immediate vicinity of the Proposed ROW. | 1 Years before onset of monsoon | 2 Years | Check and repair catch drains, storm water drains and silt trap | BSRDCL | BSRDCL |

**Accidental spillage of hazardous and non-hazardous substances needs to be dealt with as special cases largely depends on the circumstances including state of the substance (liquid or solid). Monitoring shall be carried out at all locations used for collection of primary data in the study.*

| ENVIRONMENTAL MANAGEMENT PLAN (MANSI – SAHARSA–HARDI - CHUGHARAOF SH-95 PACKAGE-3) Km 0.000 to km 14.125(Section – I) | | | | |
|---|--|-------|----------|--|
| | Description | Unit | Quantity | Remarks |
| A. | Environmental Pollution Monitoring | | | |
| | Environmental Monitoring for air, water, noise and soil attributes | | | |
| 1 | Ambient air quality monitoring along the project road for particulate matter (PM _{2.5} and PM ₁₀), sulphur dioxide (SO ₂), oxides of nitrogen (NO _x); and carbon monoxides (CO) using standard analysis technique in accordance with the National Ambient Air Quality Standards formulated by MoEF&CC and the World Bank (IFC) Air Quality Standards | Nos. | 30 | These items shall be treated as incidental to the work and no separate payment shall be made for the same |
| 2 | Sound Pressure Level (SPL) measurements along the project road using standard analysis technique in accordance with the National Ambient Air Quality Standards in respect of noise formulated by MoEF&CC and the World Bank (IFC) Air Quality Standards | Nos. | 30 | |
| 3 | Soil Quality Testing along the project road in accordance with CPCB norms | Nos. | 12 | |
| 4 | Water Quality Testing for parameters as per IS: 10500-2012 along the road in accordance with CPCB norms (ground water and surface water samples) | Nos. | 49 | |
| B. | Environmental Mitigation Measures | | | |
| 1 | Dust suppression in haul roads, material storage location and all active locations @ 3 tanker per day for 200 days | Nos. | 600 | These items shall be treated as incidental to the work and no separate payment shall be made for the same |
| 2 | Bio Toilets in Construction Camp | | | |
| | Supply of D.R.D.O Technology Bio-Digester tanks Rota-molded double wall manufactured in automatic Rota-molding machines using superior grade Virgin LLDPE (Polymer) with 2.5% Carbon Black, UV Resistant Polymer leading to highest density consistency. Thickness of the outer shell of minimum 6mm, partitions made from HDPE Polymer of 8mm thick. Immobilization Matrices of Heavy Duty Poly Grass PVC Matting lining along the partitions on both sides. Heavy duty pipes & fitting shall be used in these tanks of Finolex or equivalent make. Fasteners made of Brass shall be used inside the tank with manufacturer's test certificate and including AMI (Bacteria) of 600 liters per tank. Size of Tank: 2000 Litres capacity upto 20-30 users per day; Tank Diameter of 1425mm; Tank Height of 1600mm; Outlet pipe diameter 75mm; inlet pipe diameter 110mm. | Nos. | 2 | |
| | FRP Toilet Cabin IWC (Ceramic Pan) type of size 1250mm X 915mm X 2400mm with ± 5% tolerance. | Nos. | 4 | |
| | Installation Charges | | | |
| | i) Plumber (Skilled) | Nos. | 1 | |
| | ii) Plumber (Unskilled) | Nos. | 1 | |
| 3 | Providing solid waste management facility at construction camp, HDPE Garbage Container, Size: 940 X 480 X 550mm (L x W x D) | Nos. | 6 | |
| 5 | Oil trap/ interceptor at parking/ servicing of construction vehicles | Nos. | 2 | |
| 6 | Occupational safety appliances and PPEs for Covid-19 | Month | 24 | |
| 7 | Silt Fencing near water bodies adjacent to road | Rm | 1288 | |
| 8 | Rainwater Harvesting structures complete in all respect and confirming to the relevant specifications | Nos. | 46 | |
| 9 | Noise Barrier in hollow brick compound wall to 3.5m height using mortar, plastering and intermediate brick pillars viz; School at km 5+400 (LHS) and km 13+100 (LHS).. | Rm | 77 | |
| 13 | Information signage for safety near noise sensitive locations and all built-up sections | Nos. | - | |
| 14 | Slope/ embankment protection with Turfing of embankment and Stone pitching | Sqm | - | |

| | | | |
|----------|---|------|----|
| | Sub-Total B | | |
| C | Environmental Enhancement Measures | | |
| 1 | Provision for Solar Lighting in important major Junctions and bus bays. | Nos. | 20 |

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Appendix D-2
Involuntary Resettlement Safeguard Principles for the Project

Based on the analysis of government provisions and ADB policy, the following resettlement principles are adopted for this Project :

Commencement of Civil Works

Wherever private land is involved, compensation for land should be paid to the land owner or into court deposit, in case of ownership/appointment issues exist, prior to commencement of civil works. In stretches where there is no land acquisition and all improvements are proposed within the right-of-way, all assistances should be paid to the DP prior to giving clearance for civil works. However, any long term rehabilitation measures like training for skill development and pension for life will continue for a longer period and such rehabilitation measures will not be a bar to commence civil works.

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Appendix D-3
Resettlement Plan

April, 2022

IND: Bihar State Highways III Project (Phase-2)

Mansi to Fungo Halt Section of SH-95(Mansi-Sahrsa-Hardi Chughara Road)

Prepared by Bihar State Roads Development Corporation Limited (BSRDCL), Government of Bihar

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CURRENCY EQUIVALENTS

(As of 31 December 2021)

| | | |
|---------------|---|--------------------|
| Currency Unit | – | Indian Rupee (INR) |
| INR 1.00 | = | 0.013 USD |
| USD 1.00 | = | INR 74.35 |

ABBREVIATIONS

| | | |
|-----------------------|---|--|
| ADB | – | Asian Development Bank |
| BSR | – | Basic Schedule of Rates |
| DC | – | District Collector |
| DP | – | Displaced person |
| EA | – | Executing Agency |
| GOI | – | Government of India |
| GRC | – | Grievance Redressal Committee |
| IA | – | Implementing Agency |
| IAY | – | Indira Aawas Yojana |
| IPP | – | Indigenous Peoples Plan |
| LA | – | Land Acquisition |
| DLAO | – | District Land Acquisition Officer |
| RFCT in LARR Act-2013 | – | The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 |
| LVC | – | Land Valuation Committee |
| MORTH | – | Ministry of Road Transport and Highways |

| | | |
|------|---|---|
| NGO | – | Nongovernment organization |
| NRRP | – | National Rehabilitation and Resettlement Policy, 2007 |
| PD | – | Project Director |
| PIU | – | Project implementation unit |
| R&R | – | Resettlement and rehabilitation |
| RO | – | Resettlement Officer |
| ROW | – | Right-of-way |
| RP | – | Resettlement plan |
| SC | – | Scheduled caste |
| SH | – | State highway |
| SPS | – | Safeguard Policy Statement |
| ST | – | Scheduled tribe |

This Resettlement Plan (RP) is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

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Glossary

Cut-off Date: For titleholders in case of land acquisition, the date of publication of preliminary notification for acquisition under section 11 of the RFCT in LARR Act – 2013, is treated as the cut-off date. In case of non-titleholders, the date of start of census survey is the cut-off date.

Displaced Persons: In the context of involuntary resettlement, displaced persons are those who are physically displaced (relocation, loss of residential land, or loss of shelter) and/or economically displaced (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.

Economic Displacement: Loss of land, assets, access to assets, income sources, or means of livelihoods as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.

Insignificant Impact: Where the impact on land is less than 10 percent of the total area or impact on structure is partial and does not require relocation.

Meaningful Consultation: A process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

Physical Displacement: Relocation, loss of residential land, or loss of shelter as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.

Vulnerable groups: include those below the poverty line, the landless, the elderly, women and children, and Indigenous Peoples, and those without legal title to land.

Significant Impact: Landowners losing shelter and required relocation or losing more than 10% of their productive assets.

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EXECUTIVE SUMMARY

1. Project Description

1. The Bihar State Road Development Corporation Limited (BSRDCL), Government of Bihar is planning to upgrade State Highway number 95 (Mansi-Saharsa-Hardi Chughara Road) from existing single/intermediate lane to double lane with total road length of 28.08 km in Khagaria and Saharsa districts and requested ADB for financing of the project. This RP for two-lane road project is prepared based on the detailed design report prepared by BSRDCL. The RP complies with the applicable State Government, Government of India, and ADB policy and legal framework. This project is considered as Category A⁴ for Involuntary Resettlement (IR) per ADB's Safeguard Policy Statement (SPS 2009).

2. The proposed 2-lane road, predominantly traverses through plain terrain, starts from the T-junction with NH-31 at km 276+200 of NH-31 at Manasi in Khagaria district and ends at Km.28.08 near Bharara village in Saharsa district. The land use along the project road includes agriculture land, residential use, and commercial areas. The project aims to provide smooth traffic movement for the escalating traffic and enhance capacity and improved services to alleviate the likely capacity constraints to be generated after the future development in the region. The project on its implementation would increase the physical infrastructure and boost the economic growth in the region.

3. Scope of Land Acquisition and Resettlement

4. As per the technical design, the roadway width proposed for 2-lane carriageway with paved shoulder is 12.00 mtr. The existing Right of Way, as per the government records, is 0 to 35 mtr. The road has a bypass/missing link where government land is not available and hence, private land will be acquired with proposed RoW of 45 mtr. The proposed centerline is designed such that minimal land acquisition is required. The project impact assessed through project census survey includes loss of land and non-land assets and loss of livelihoods. It was found that 67.77 acre of private land and 570 structures owned by 665 households will be affected. The affected households are both titleholders and non-titleholders i.e encroachers and squatters. A full census survey was carried out to identify the persons who would be displaced by the project and the summary findings are presented in the following Table 1.

Table 1: Summary Project Impacts

| Sl. No. | Impacts | Number |
|---------|--|--------|
| 1 | Area of private land to be acquired (in Acres) | 67.77 |

⁴ ADB Safeguard Policy Statement Operations Manual Section F1: Involuntary Resettlement Category A: Significant means 200 or more affected people will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating). Involuntary Resettlement Category B: Not Significant include involuntary resettlement impacts that are not deemed significant as per the ADB Operational manual Involuntary Resettlement Category C: No involuntary resettlement impacts. A resettlement plan is required in case of both category A and B project.

| Sl. No. | Impacts | Number |
|---------|---|--------|
| 2 | Total number of private structures affected | 570 |
| 3 | Total number of displaced households | 665 |
| 4 | Total number of displaced persons | 4563 |
| 5 | Total number of economically displaced households | 429 |
| 6 | Total number of physically displaced households | 223 |
| 7 | Total number of economically and physically displaced household | 13 |
| 8 | Total number of vulnerable households displaced | 553 |
| 9 | Total number of CPR (structure) affected | 29 |

5. Socioeconomic Information and Profile

6. The social stratification of the project area shows the dominance of other backward caste (OBC) population with 514 (79.2%) households. There are 4563 displaced persons in total, which includes 2619 (57%) males and 1944 (43%) females. The average household size is 6.9 and the sex ratio among DPs is 742. According to project census survey there are 553 vulnerable households affected by the project. The educational status of DPs reveals that 45.26% DPs are still illiterate in the project area. Not a single scheduled tribe (ST) household is found to be affected under this subproject.

7. Stakeholders Consultation and Participation

8. Public consultations were conducted at 5 locations attended by 175 persons (77 male and 98 female) in the project to ensure peoples participation during the project census survey. The male and females were consulted in separate consultation meetings. Aiming at promotion of public understanding and fruitful solutions of developmental problems such as local needs and problem and prospects of resettlement, various sections of DPs and other stakeholders were consulted through focus group discussions and individual interviews. Several additional rounds of consultations with DPs and communities will form part of the further stages of project preparation and implementation. The RP implementing agency will be entrusted with the task of conducting these consultations during RP implementation, which will involve disclosure on compensation, assistance options, and entitlement package and income restoration measures suggested for the project.

9. To keep more transparency in planning and for further active involvement of DPs and other stakeholders the project information will be disseminated through disclosure of resettlement planning documents. The EA will provide relevant resettlement information, including information from the Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95) in the State of Bihar on EPC Mode

above-mentioned documents in a timely manner, in an accessible place and in a form and language(s) understandable to displaced persons and other stakeholders.

10. Legal Framework

11. The legal framework and principles adopted for addressing resettlement issues in the Project have been guided by the existing legislation and policies of the GOI, the Government of Bihar and Asian Development Bank. Prior to the preparation of the RP, a detailed analysis of the existing national and state policies was undertaken and an entitlement matrix has been prepared for the project. This RP is prepared based on the review and analysis of all applicable legal and policy frameworks of the country and ADB policy requirements. The gaps between the policies have been identified and addressed to ensure that the RP adheres to the SPS (2009) requirements.

12. All compensation and other assistances will be paid to all DPs prior to commencement of civil works. After payment of compensation, DPs would be allowed to take away the materials salvaged from their dismantled houses and shops and no charges will be levied upon them for the same. The value of salvaged materials will not be deducted from the overall compensation amount due to the DPs. A notice to that effect will be issued intimating that DPs can take away the materials.

13. Entitlements, Assistance and Benefits

14. For titleholders in case of land acquisition, the date of publication of preliminary notification for acquisition under section 11 of the RFCT in LARR Act – 2013 will be treated as the cut-off date. For non-titleholders, the cut-off date will be the start of the census survey which is 17 November 2021 in case of SH-95. The structures affected under the project will be compensated at replacement cost. DPs who settle in the affected areas after the cut-off date will not be eligible for compensation. They, however, will be given sufficient advance notice, requested to vacate premises and dismantle affected structures prior to project implementation. Their dismantled structures materials will not be confiscated and they will not pay any fine or suffer any sanction.

15. Relocation of Housing and Settlements

16. There are 226 households will be losing their shelter and therefore, require relocation. The IA will provide adequate and appropriate cash compensation at full replacement cost to the titleholders for their lost land and structures including eligible relocation assistance. The IA will compensate to the non-titleholders for the loss of assets other than land, such as dwellings, and also for other improvements to the land at full replacement cost with eligible assistance. The entitlements to the non-titleholders will be given only if they occupied the land or structures in the project area prior to the cut-off date.

17. Income Restoration and Rehabilitation

18. The project impact reveals that due to loss of land and commercial structures, 371 households are losing their livelihood under the project. The entitlement proposed for the project has adequate provisions for restoration of livelihood of the affected communities. The focus of restoration of livelihoods is to ensure that the DPs are able to at least achieve national minimum standards. To restore and enhance the economic conditions of the DPs, certain income generation and income restoration programs are incorporated in the RP. To begin with providing employment to the local people during the construction phase will enable them to benefit from the project, reduce the size of intrusive work forces and keep more of the resources spent on the project in the local economy. It will also give the local communities a greater stake and sense of ownership in the project.

19. Resettlement Budget and Financing Plan

20. The resettlement cost estimate for this project includes eligible compensation, resettlement assistance and support cost for RP implementation. The support cost, which includes staffing requirement, monitoring and reporting, involvement of RP implementing agency in project implementation and other administrative expenses are part of the overall project cost. Contingency provisions have also been made to take into account variations from this estimate. The total budget for the proposed project RP is Rs 714.3 million.

21. Grievance Redressal Mechanism

22. A Grievance Redressal Committee (GRC) will be established at the district level with the primary objective of providing a mechanism to mediate conflict and cut down on lengthy litigation. It will also provide people, who might have objections or concerns about their assistance, a public forum to raise their objections and through conflict resolution, address these issues adequately. The GRC will be headed by the District Collector (DC) or his designated representative. The GRC will have representative from the PIU, representative of APs, particularly of vulnerable DPs, local government representative, representative of local NGOs and other interest groups as felt necessary. All Grievances will be routed through the RP implementing agency to the GRC. The RP implementing agency will act as an in-built grievance redress body. The RP implementing agency will first of all register the grievances and take up with VLC for redress and any grievances not redressed at VLC level will be dealt in by the GRC. Grievances will be redressed within two to four weeks from the date of lodging the complaints, depending on severity of problem. However, an aggrieved person will have access to the country's judiciary at any stage of the project level grievance redress process. Taking grievances to Judiciary will be avoided as far possible and the RP implementing agency will make utmost efforts at reconciliation at the level of GRC.

23. Institutional Arrangement

Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95) in the State of Bihar on EPC Mode

24. The Executing Agency (EA) for the Project is BSRDC, Government of Bihar. The existing BSRDC has already set up a Project Implementation Unit (PIU) headed by a Deputy General Manager (DGM) assisted by Managers. This office will be functional for the whole Project duration. The PIU will hire an RP implementing agency for supporting it in implementation of R&R activities. The staffs at the PIU level will be provided with the training by the social/ resettlement specialist of the supervision consultant for implementation of the RP. Many of the BSRDC staffs are already having prior experience of implementing RP under previous projects and further to enhance their capacity, a training/workshop will be conducted under the project involving other implementing support agencies.

25. Implementation Schedule

26. Implementation of RP mainly consists of compensation to be paid for affected structures and rehabilitation and resettlement activities. The time for implementation of resettlement plan will be scheduled as per the overall project implementation. The civil works contract for each project will only be awarded after all compensation and relocation has been completed for project and rehabilitation measures are in place. The proposed project R&R activities are divided in to three broad categories based on the stages of work and process of implementation such as Project Preparation phase, RP Implementation phase and Monitoring and Reporting phase.

27. Monitoring and Reporting

28. RP implementation for the project by the RP implementing agency will be closely monitored by the EA. Keeping in view the significance of resettlement impacts of the overall project, the monitoring mechanism for this project will have both internal monitoring by PIU and external monitoring by an external expert. PIU responsible for supervision and implementation of the RP will prepare monthly progress reports on resettlement activities and submit to PIU. PIU will submit semi-annual RP monitoring reports to ADB. The external monitoring expert responsible for monitoring of the RP implementation will submit a semi-annual review report to EA and ADB to determine whether resettlement goals have been achieved, more importantly whether livelihoods and living standards have been restored/ enhanced and suggest suitable recommendations for improvement.

1. PROJECT DESCRIPTION

Introduction

29. Bihar has experienced consistent socio-economic development over the last decade with an economic growth rate of 15.01 % at current prices in year 2018-19 which is higher than the growth rate for the Indian economy.⁵ Significant improvement in road infrastructure has led to a cumulative growth in all sectors like agriculture, labor, employment, trade and manufacturing resulting in an increased per capita income from Rs. 21,750 in 2011-12 to Rs 30,617 in 2018-19. However, Bihar remains as 5th low-income state of India along with 34% of population living below poverty line⁶

30. The aim of Sustainable Development Goal-9 (SDG 9) is to develop quality and resilient infrastructure at the regional and transborder levels. The available and accessible infrastructure is an important driver for economic development. Infrastructure complements economic growth and vice versa. For instance, the development of transport infrastructure expands the scope and size of the market and also improves productivity significantly; on the other hand, economic growth enables the state to create more infrastructure. Apart from ensuring better economic growth prospect, integration of local markets with the global market, technological innovation, and the progress in infrastructure also help in reducing poverty.

31. The economy of Bihar is mainly based on agricultural and trading activities. The industrial and agricultural developments have led to higher transport demand. With the higher transport demand and the expansion of the existing business, there is a growing mismatch between the vehicular population and availability of road infrastructure, which has resulted in traffic congestions, deteriorated level of traffic efficiency and road safety. As a result of the aforementioned growth and need to fulfill the mismatch, various new infrastructure development projects have been planned across the state. The Government of Bihar acting through Bihar State Road Development Corporation Limited (BSRDCL) has taken the needful action.

32. The road master plan⁷ prepared by State Government of Bihar under ADB-supported TA-8170 estimates that \$15.8 billion is required in capital expenditure for road improvements by 2035. Following this plan, BSRDC through the Government of Bihar, posed a proposal to ADB to take up a set of state roads for upgrading into two-lanes with paved shoulders. For the proposed sub project road, State Government of Bihar will be the Executing Agency (EA) and the Implementing Agency (IA) will be the BSRDCL. A Project Implementation Units (PIU) is established for the project and they are responsible for conducting the social assessment and formulating Resettlement Plan (RP) for the project.

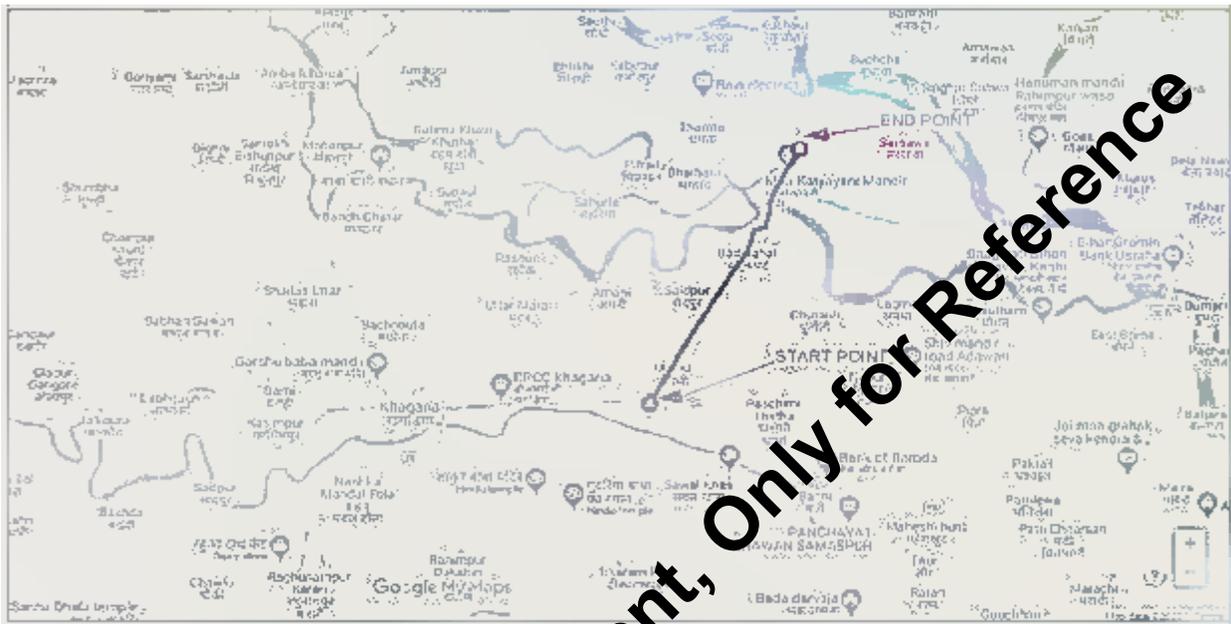
⁵ Bihar Economic Survey, 2019 – 20, Finance Department, Government of Bihar

⁶ Bihar: Poverty, Growth & Inequality, World Bank Group, May 2016

⁷ Road Master Plan for Bihar's State Highway Development (2015-2035). Prepared under TA-8170 with Loan 2894- IND "India: Bihar State Highways II Project — Additional Financing."

Project Description

33. The SH-95 (Mansi-Sahrsa-Hardi Chughara) Road Project proposed under Phase-II of BSHP-III is located in the Khagaria and Saharsa districts of Bihar. The Project Road predominantly traverses through plain terrain, starts from the T-junction with NH-31 at km 276+200 of NH-31 at Mansi in Khagaria district and ends at Km.28.08 near Bharara village in Saharsa district. There is no clear physical demarcation of the existing right of way at site. As per information provided by BSRDC, RoW is 35 mtr. in existing alignment and 45 mtr. in the greenfield. The project location map is presented in **Figure 1**.
Figure 1: Location Map of Project Road



34. The total road length is 28.080 kms with single lane (width-3.75 mtr) specification. The sub project road starts at km 0.000 from NH-31 at Mansi village in Khagaria district and ends near Bharara village. The land use along the project road is predominantly agricultural and residential except the 6.81km which runs through the basin of Bagmati, Katyani and Koshi rivers. Project road passes through 14 settlement/villages as presented in following **Table 2**.

Table 2: List of Project Affected Villages

| S.No | Project Villages/ Settlements | Name of District | Name of Block | Chainage (km) | |
|------|----------------------------------|------------------|---------------|---------------|-------|
| | | | | From | To |
| 1 | Mansi (Khutia) | Khagaria | Mansi | 0+300 | 2+000 |

| S.No | Project Villages/ Settlements | Name of District | Name of Block | Chainage (km) | |
|------|----------------------------------|------------------|--------------------|---------------|--------|
| | | | | From | To |
| 2 | Saidpur | Khagaria | Mansi | 3+300 | 3+400 |
| 3 | Balha | Khagaria | Mansi | 5+000 | 6+400 |
| 4 | Khirnia | Khagaria | Chautham | 6+500 | 7+700 |
| 5 | Hardiya | Khagaria | Chautham | 7+700 | 8+600 |
| 6 | Dighari | Khagaria | Chautham | 8+600 | 10+700 |
| 7 | Dhamahara | Khagaria | Chautham | 10+700 | 13+200 |
| 8 | Buchcha (Dhanchhar) | Khagaria | Chautham | 13+600 | 14+500 |
| 9 | Kopadiya | Saharsa | Salakhua | 17+300 | 18+200 |
| 10 | Mobarakpur | Saharsa | Salakhua | 22+000 | 22+300 |
| 11 | Gurgawan | Saharsa | Salakhua | 23+100 | 24+100 |
| 12 | Gouspur | Saharsa | Salakhua | 24+000 | 24+900 |
| 13 | Simri Bakhtiyarpur | Saharsa | Simri Bakhtiyarpur | 25+000 | 27+400 |
| 14 | Bharara | Saharsa | Simri Bakhtiyarpur | 27+400 | 27+600 |

Source: Census Survey, September- December, 2021

35. The proposed road alignment provides a direct connectivity to the traffic plying between Khagaria to Saharsa, Supaul and Madhepura and surrounding area and vice versa, in turn saving travel time, relieving congestion on NH-31 and NH-107 and acting as a catalyst for Rapid development of Manasi, Simri Bakhtiyarpur, Saharsa, Hardi and Chaugarha and other areas of the Khagaria, Saharsa and Supaul districts of state of Bihar. The road aims to provide smooth traffic movement for the escalating traffic and enhance capacity and improved services to alleviate the likely capacity constraints to be generated after the future development in the region. The project on its implementation would increase the physical infrastructure and boost the economic growth in the region.

36. This RP for 95 (Mansi-Saharsa-Hardi Chughara) Road subproject is prepared based on the detailed design report prepared by BSRDCL. The RP complies with the applicable State Government, Government

of India and ADB policy and legal framework. This project is considered as Category A⁸ for Involuntary Resettlement (IR) as per the ADB Safeguard Policy Statement (SPS 2009).

General Profile of the Project Area

37. The project area consists of two districts of Bihar i.e., Khagaria and Saharsa. Brief profile of the districts is narrated below.

38. **Khagaria** district in Bihar was previously a subdivision of Munger district and created as a separate district in 1981. The district occupies the area of 1485.8sq.km and is surrounded by seven rivers namely Ganges, Kamla balan, Koshi, Budhi Gandak, Karch, Kali Koshi and Bagmati. Administratively, the district is divided into two subdivisions- Khagaria and Gogri and 7 development blocks. There are total 306 revenue villages and 129 panchayats. The district is economically poor and receiving funds from the Backward Regions Grant Fund Program (BRGF).

39. As per the Census 2011, Khagaria district had total population of 1,666,886 persons. Out of which 883,786 are males while 783,100 are females. In 2011 there were total 328,823 families residing in Khagaria district. The Average Sex Ratio of Khagaria district is 886. Out of total population, 5.2% people live in urban areas while 94.8% lives in the rural areas. The literacy rate of the district is found to be 57.92%. The male literacy rate is 52.18% and the female literacy rate is 59.29%. The literacy rate in urban areas and rural areas is 76.7% and 56.8% respectively.

40. Wheat is the prominent rabi crop in alluvial soil of the district. Due to floods and water logging, the paddy production is very low, except in the southern part of the district. Maize is grown abundantly almost throughout the district, while banana cultivation as a cash crop, has grown into prominence in last two decades. Banana cultivation is done mostly in Choutham, Gogari and Parvatta blocks. Apart from these mango and litchi orchards are abundant in the district and are found almost throughout the entire area. Trade and commerce are the only non-agricultural economic activity in the district. Khagaria and Gogri Jamalpur are the two important trade centers. Main trading item is food grains. Apart from food grains there are small number of traders in other items, as, textiles, hardware, jewelry and other commonly used items.

41. **Saharsa** is located in the Mitthila region, one of the earliest centres of Brahminical civilization in India. Earlier, the Saharsa district was part of the Munger and Bhagalpur districts. Saharsa district occupies an area of 1,687 square kilometers. Saharsa district is surrounded on the west by the river Kosi, an abundance of fish and makhana. Saharsa district is divided into two Sub-Divisions namely Saharasa

⁸ According to ADB Safeguard Policy Statement (SPS-2009), Involuntary Resettlement Category A: Significant means 200 or more affected people will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating). Involuntary Resettlement Category B: Not Significant include involuntary resettlement impacts that are not deemed significant as per the ADB Operational manual Involuntary Resettlement Category C: No involuntary resettlement impacts. A resettlement plan is required in case of both category A and B project.

Sadar and Simri Bakhtiyarpur, 10 development blocks comprising total 151 village panchayats. Saharsa town is the administrative headquarters of this district.

42. According to census 2011, Saharsa district had total population of 1,900,661, out of which 997,174 are males while 903,487 are females. In 2011 there were total 368,979 families residing in Saharsa district. The average Sex Ratio of Saharsa district is 906. The population density of the district is found to be 1,127 people per square kilometer. The urban and rural composition of the population is 8.2% and 91.8% respectively. The total literacy rate of Saharsa district is 53.2%. The male literacy rate is 50.78% and the female literacy rate is 33.05%.

43. Saharsa and its surrounding areas occupy a flat alluvial plain forming part of the Kosi river basin. The city lies in the Kosi alluvial megafan, one of the largest alluvial fans in the world. The land is very fertile but frequent changes in the course of the Kosi, one of the largest tributaries of the Ganges have led to the problems associated with soil erosion. Flooding is a major reason for the poor connectivity of the area; bridges are often washed away. Major flooding occurs almost annually, causing a significant loss of life and property. It is a major producer of best quality of Corn and Makhana in India. Every year 2 lakhs tones of each corn and Makhana are exported to different countries. The other crops grown in the region are rice, mangoes, litchi, bamboo, mustard, wheat and sugarcane.

Table 3: Demographic Indicators of Project Districts and State

| Indicators | Bihar | Khagaria | Saharsa |
|------------------------------------|-------------|----------|-----------|
| Total Population | 104,099,452 | 1,55,886 | 1,900,661 |
| Rural Population | 88.7% | 94.8% | 91.8% |
| Urban Population | 11.3% | 5.2% | 8.2% |
| Area (Sq.Km.) | 94,163 | 1,486 | 1,687 |
| Population Density/Km ² | 1,106 | 1,122 | 1,127 |
| Sex Ratio | 918 | 886 | 906 |
| Literacy % | 61.8 | 57.92 | 53.2% |
| Schedule Tribe | 1.28% | 0.04% | 0.3% |

Source: Census of India, 2011

Project Impact and Benefits

44. The proposed project can be viewed as boosting economic growth and poverty reduction which will bring substantial social and economic development to the region. The social benefits arising due to the project will be triggered due to improved accessibility to various services such as to markets, health

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facilities, schools, and workplace, which in turn increases the income of the local residents, and ultimately elevating their standard of living. The possible direct and indirect positive impacts of the project are listed below.

45. The immediate benefits of road construction and improvement will come in the form of direct employment opportunities for the roadside communities and specially those who are engaged as wage laborers, petty contractors and suppliers of raw materials.
46. Improved road network will provide for improved linkages between the village communities and urban center, which provides wider marketing facilities.
47. Road network will not only link the village communities to better markets, but also open up wider work opportunities in distant places. People can shuttle to distant work sites and towns and engage in construction, factories, business as well as domestic works.
48. Improved road network will encourage urban entrepreneurs to invest in far and remote areas in commercial farming and industrial activities.
49. Improved road will also help people building strong institutional network with outside agencies. Essential and emergency services like schools, health center, public distribution system etc. can be availed faster.
50. Increased frequency of interaction with outsiders will increase the awareness level of the people in the village with regard to their health and nutrition, living standards, value of education and proper utilization of available resources.
51. Interaction with the government, non-government and other development agents will help people gain new knowledge on improved farming, land development, development and maintenance of natural resources through the formation of various economic and social development groups.

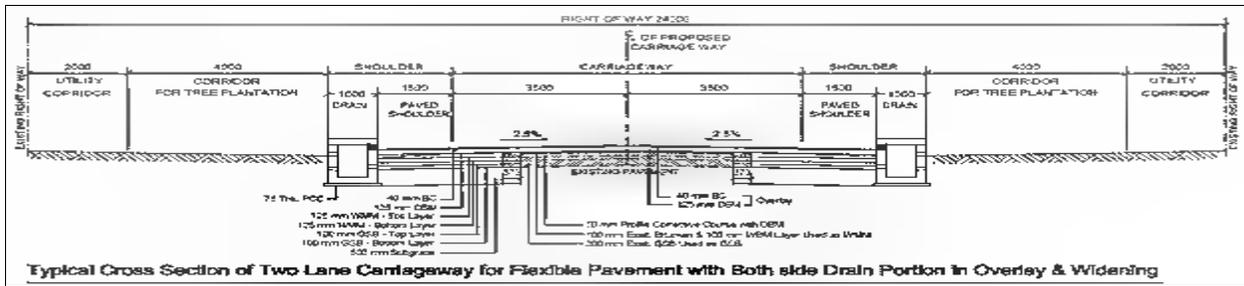
Minimizing Resettlement

52. Adequate attention has been given during the feasibility and detailed design phases of the project preparation to minimize the adverse impact on land acquisition and resettlement. However, technical and engineering constraints were one of the major concerns during exploration of various alternatives, especially in relations to road safety and decreasing congestion in key sections.

53. The inventory data and typical cross-sections formed the basis of determining the widening requirement. Based on this information along with presence of buildings, trees, utility services along the project road, the centerline of the alignment is designed so as to cause minimum disturbance to existing features. The existing RoW as per the government records is 35 mts in existing alignment. The PRoW required in greenfield is 45 mts. Having green field alignment land acquisition is envisaged under the subproject.

54. The pictorial view of the proposed 2-lane typical cross section is given in **Figure 2**. The carriage way width of 7m is proposed with 2×1.5m paved shoulder and 2×1m earthen shoulder. Lined drain of RCC is proposed in urban areas.

Figure 2 Typical Cross Section of The Road



Scope and Objective of Resettlement Plan (RP)

55. The aim of this Resettlement Plan (RP) is to mitigate all such unavoidable negative impacts caused due to the project and resettle the displaced persons and restore their livelihoods. This RP has been prepared on the basis of project census survey findings and consultation with various stakeholders. The plan complies with ADB Safeguard Policy Statement, 2009 designed by ADB to protect the interests of the displaced persons and communities. The issues identified and addressed in this document are as follows:

56. Type and extent of loss of land and non-land assets, loss of livelihood, loss of common property resources and social infrastructure;
57. Impacts on indigenous people, vulnerable groups like poor, women and other disadvantaged sections of society
58. Public consultation and peoples' participation in the project;
59. Existing legal and administrative framework and formulation of resettlement policy for the project;
60. Preparation of entitlement matrix, formulation of relocation strategy and restoration of businesses/income;
61. R&R cost estimate including provision for final land;
62. Institutional framework for the implementation of the plan, including grievance redress mechanism and monitoring & reporting.

Methodology for Resettlement Plan

63. For preparation of this RP, a detailed social impact assessment of the project road was carried out including resettlement screening, and acquisition planning, project census survey of affected assets and households and public consultation meetings. The details of methodology adopted for the social impact assessment is discussed in the following section.

64. Resettlement Screening

65. A social screening exercise was performed through a reconnaissance survey to gather firsthand information on impact on land acquisition and resettlement with specific attention on land use, presence of legal and/or illegal housing, traffic patterns, cultural resources, urban settlements and other sensitive areas. The aim of reconnaissance survey was to assess the scope of land acquisition and

resettlement study and accordingly the detailed plan of action was prepared for the preparation of resettlement plan.

66. Resettlement Planning

67. The alignment was finalized as per the detailed engineering design. Initially, the numbers of affected villages were identified as per the alignment and availability of government land was confirmed from the revenue department. Following finalization of the road alignment, cross-sections design and land acquisition requirements, census of all displaced persons (DPs) was carried out in the project. The objective of the project census survey was to identify the persons who would be displaced by the project and to make an inventory of their assets that would be lost to the project, which would be the basis of calculation of compensation.

68. A structured census questionnaire (**Appendix 1**) was used to collect detailed information on affected households/ properties for a full understanding of impacts in order to develop mitigation measures and resettlement plan for the DPs. The survey team was selected locally including some female familiar with local languages and the team was trained by the resettlement specialist and the survey was closely monitored on a regular basis. Additionally, socio-economic data was also collected from the affected households. The census survey includes the following:

- 69. Inventory of the 100% non-land assets
- 70. Categorization and measurements of potential loss
- 71. Physical measurements of the affected assets/structures
- 72. Identification of trees and crops
- 73. Collection of information on social, economic and demographic profile
- 74. Identification of non-titleholders
- 75. Assessment of potential economic and livelihood impact

76. Public Consultation

77. To ensure peoples' participation in the planning phase and aiming at promotion of public understanding and fruitful solutions of developmental problems such as local needs of road users and problem and prospects of resettlement, various sections of displaced persons (DPs) and other stakeholders were consulted through focus group discussions, individual interviews and formal and informal consultation. The vulnerable sections of DPs and women were also included in this consultation process.

2. SCOPE OF LAND ACQUISITION AND RESETTLEMENT

78. Land Acquisition Requirement

79. It is proposed to develop the existing single lane with missing link road to 2-lane carriageway with paved shoulders. The road formation width proposed for 2-lane carriageway with paved shoulder is only 12.00 m. The existing Right of Way, as verified from the government records is 35 mts. Due to construction of a bypass/missing link in greenfield the PRoW required is 45 mts. Due to having greenfield alignment a LAP has been prepared by BSRDCL to acquire private land and therefore the acquisition of private land will impact both titleholder (TH) in addition to non-titleholder (NTH) under this road subproject.

80. As per the LAP prepared for the proposed Project and R&R survey conducted, 79.17 acre of land need to be acquired under this project. The analysis of land acquisition requirement for the project shows that out of total land required for the project 67.77 acre (85.6%) of land is private land, 10.59 acre (13.38%) is government land and 0.81 acre (1.02%) is religious land. Acquisition of land will affect a total of 242 households. The land acquisition requirement for the project is presented in the **Table 4**.

Table 4: Land Acquisition Requirements under the Project

| Sl. No. | Type of Ownership | DH | Area (in Acre) | % |
|--------------|-------------------|------------|----------------|---------------|
| 1 | Private Revenue | 242 | 67.77 | 85.60 |
| 3 | Government | 0 | 10.59 | 13.38 |
| 4 | Religious | | 0.81 | 1.02 |
| 5 | Community | | 0.00 | 0.00 |
| Total | | 242 | 79.17 | 100.00 |

81. Resettlement Impacts

82. Based on the above requirements, the project impact assessed through project census survey includes loss of land, loss of non-land assets and loss of livelihoods. Other than this, non-land assets known as common properties resources (CPR) including religious, and community ownership are also assessed to be affected by the proposed project.

83. A project census survey was carried out to identify the persons who would be displaced by the project and to make an inventory of their assets that would be lost due to the project, which would be the basis of calculation of compensation. The census survey of proposed SH-95 was carried out in between 17 November 2021 and 5 January 2022. Before start of census survey, a videography was also done on the entire stretch to cover the existing road conditions and structures/buildings within the RoW. For titleholders, the date of publication of preliminary notification for acquisition of land under section 21 of the RFCT in LARR Act – 2013 will be treated as the cut-off date. The start day of project

census survey is the cut-off date for non-titleholders eligible for compensation and assistance under the project. It was found that a total 665 households (649 losing land, structure or both and 16 tenants losing their livelihood) would be displaced by this sub project. The details are being provided in the **Table 5 and 6.**

Table 5: Loss of Property and Number of Displaced Households

| Sl. No. | Category of Loss | No. of Household | % |
|--------------|---------------------|------------------|---------------|
| 1 | Land with Structure | 53 | 7.97 |
| 2 | Only Structure | 407 | 61.20 |
| 3 | Only Land | 189 | 28.42 |
| 4 | Other DPs (Tenant) | 16 | 2.41 |
| Total | | 665 | 100.00 |

84. It was found that a total of 223 households will be physically displaced due to loss of residential structure. Among them 44 are TH and 179 are NTH. Similarly, 429 households will be economically displaced due to loss of land parcel or commercial structures. These include 217 TH and 212 NTH. There are a total 13 household who will be displaced physically and economically include 5 TH and 8 NTH. A summary on category wise displacement of households is given in **Table 6.** The list of DPs is attached as **Appendix-2**, and photo identification of DPs is given in **Appendix 3.** The findings and magnitude of impacts are discussed in the following sections.

Table 6: Category wise Displacement of Households

| Sl. No. | Category of Impact | No. of Household | % | TH | NTH |
|--|---------------------------------|------------------|------------|-----------|------------|
| Physically Displaced Households | | | | | |
| 1 | Owners of Residential Structure | 223 | 100 | 44 | 179 |
| 2 | Residential Tenant | 0 | 0 | 0 | 0 |
| Total | | 223 | 100 | 44 | 179 |
| Economically Displaced Households | | | | | |
| 1 | Owners of Agricultural Land | 189 | 44.06 | 189 | 0 |
| 2 | Agricultural Labourer | 0 | 0.00 | 0 | 0 |

| | | | | | |
|---|---|------------|---------------|------------|------------|
| 3 | Agricultural Tenants/ Leaseholders | 0 | 0.00 | 0 | 0 |
| 4 | Sharecropper | 0 | 0.00 | 0 | 0 |
| 5 | Loss of Commercial Structure | 153 | 35.66 | 3 | 150 |
| 6 | Commercial Tenants | 16 | 3.73 | 0 | 16 |
| 7 | Employees in Structures | 0 | 0.00 | 0 | 0 |
| 8 | Other Private | 71 | 16.55 | 25 | 46 |
| Total | | 429 | 100.00 | 217 | 212 |
| Physically and Economically Displaced Households | | | | | |
| 1 | Owners of Resi+ Commerical Structure | 13 | 100 | 5 | 8 |
| Total | | 13 | 100 | 5 | 8 |
| Grand Total | | 665 | 100 | 266 | 399 |

85. Loss of Private Land in the Project

86. The land acquisition for the project will affect 242 titleholder households and the area of acquisition will be a total of 67.77 acre. Out of total affected land 92.16% is agriculture land affecting a total 221 households as shown in the **Table 7**.

Table 7: Type of Affected Private Land

| Sl. No. | Type of Land | DH | Area (in Acre) | % |
|--------------|--------------|------------|----------------|---------------|
| 1 | Irrigated | 221 | 62.46 | 92.16 |
| 2 | Residential | 21 | 5.31 | 7.84 |
| Total | | 242 | 67.77 | 100.00 |

87. The land to be acquired under the Project is under various use. It includes 50.58 acre of land being used by 171 households for agriculture, 0.42 acre for orchard by 2 households, 16.76 acre of land being used by 65 households for residential purpose and 0.03 acre of land by only one household for not any specific purpose as shown in the **Table 8**.

Table 8: Use of Affected Private Land

| Sl. No. | Land Use Type | DH | Area (in Acre) | % |
|--------------|---------------|------------|----------------|---------------|
| 1 | Cultivation | 171 | 50.58 | 74.63 |
| 2 | Orchard | 2 | 0.42 | 0.62 |
| 3 | Residential | 68 | 16.76 | 24.72 |
| 4 | Commercial | 0 | 0.00 | 0.00 |
| 5 | Forestation | 0 | 0.00 | 0.00 |
| 6 | No Use/Barren | 0 | 0.00 | 0.00 |
| 7 | Other | 1 | 0.02 | 0.02 |
| Total | | 242 | 67.77 | 100.00 |

88. The total land (67.77 acre) under acquisition belong to titleholders only. The ownership is of both single and joint type. It was found that to a maximum 76.45% displaced households have single ownership on the affected plot. The details of private land ownership are provided below in **Table 9**.

Table 9: Type of Private Land Ownership

| Sl. No. | Type of Ownership | No. of Household | % |
|--------------|-------------------|------------------|---------------|
| 1 | Single | 185 | 76.45 |
| 2 | Joint | 57 | 23.55 |
| 3 | Other | 0 | 0.00 |
| Total | | 242 | 100.00 |

89. Magnitude of Impact on Land in the Project

90. The survey revealed that 90 (37%) households are losing less than 10 % of their land parcel and therefore, the impact is not significant as per ADB's SPS. The other 152 (63%) households are losing more than 10% of their productive asset and hence, the impact is significant. The proportion of significantly impacted DPs is high mainly due to acquisition of private land in greenfield area of proposed alignment. The details are provided in **Table 10**.

Table 10: Magnitude of Impact and Displaced Households

| Sl. No. | Scale of Impact | No. of Household | % |
|---------|-----------------|------------------|-------|
| 1 | Up to 10% | 90 | 37.19 |

| | | | |
|--------------|-------------------------|------------|---------------|
| 2 | Above 10% and Below 25% | 76 | 31.40 |
| 3 | Above 25% and Below 50% | 59 | 24.38 |
| 4 | Above 50% and Below 75% | 15 | 6.20 |
| 5 | Above 75% | 2 | 0.83 |
| Total | | 242 | 100.00 |

91. Loss of Private Structures in the Project

92. Due to the proposed project work, 570 structures, owned by 460 displaced households will be affected. Among these, 129 structures belong to 53 legal titleholders, 95 structures are owned by 83 encroachers and rest 346 structures are owned by 324 squatter households. The details of loss of structures are presented in the **Table 11**.

Table 11: Loss of Private Structures in the Project

| Sl. No. | Ownership Status | No. of Structure | No. of DHs | No. of PAs | % |
|--------------|-------------------|------------------|------------|-------------|---------------|
| 1 | Legal Titleholder | 129 | 53 | 265 | 15.05 |
| 2 | Encroacher | 95 | 83 | 461 | 16.52 |
| 3 | Squatter | 346 | 324 | 1909 | 68.42 |
| 4 | Other | 0 | 0 | 0 | 0.00 |
| Total | | 570 | 460 | 2790 | 100.00 |

93. The magnitude of impacts on private structures shows that out of 570 affected structures, 43 (8.9%) structures are affected up to 25%, 76 (14.1%) structures are affected up to 50%, 84 (17.2%) structures affected up to 75% and 367 (51.8%) structures are affected fully. The site condition suggests that most of the structures getting affected more than 50% will not be viable for living and need relocation. The details of magnitude of impacts on structures are summarized in the **Table 12**. Provisions are also included in the Entitlement Matrix that structures will be compensated at replacement cost fully, and partially if it is viable. Engineer from Building Department will assess the viability of structure during verification and valuation in consultation with the affected households.

Table 12: Magnitude of Impacts on Structures

| Sl. No. | Scale of Impact | No. Structure | HH | % |
|---------|-----------------|---------------|----|-----|
| 1 | Below 25% | 43 | 41 | 8.9 |

| | | | | |
|--------------|-----------|------------|------------|--------------|
| 2 | Up to 50% | 76 | 65 | 14.1 |
| 3 | Up to 75% | 84 | 79 | 17.2 |
| 4 | 100% | 367 | 275 | 59.8 |
| Total | | 570 | 460 | 100.0 |

94. Type of Private Structure in the Project

95. As per census survey, out of 460 households losing their structures in the project, 223 household are losing residential structures, 153 households are losing commercial structures, 13 are losing their residential-cum-commercial structures and 71 are losing other types of structures such as cattle shed, boundary wall, toilet, etc. The details of structures and number of displaced households are given in the **Table 13**.

Table 13: Type of Private Structure affected by the Project

| Sl. No. | Type of Structure | No. of Structure | DHs | % |
|--------------|---------------------------|------------------|------------|--------------|
| 1 | Residential Structure | 292 | 223 | 25.84 |
| 2 | Commercial Structure | 168 | 153 | 17.73 |
| 3 | Resi+Commercial Structure | 15 | 13 | 1.51 |
| 4 | Other Private Structure | 45 | 71 | 8.23 |
| Total | | 570 | 460 | 100.0 |

96. Use of Private Structures affected by the Project

97. The structures being affected in the project are of various usages and the details are presented in the **Table 14**.

Table 14: Use of Private Structure affected by the Project

| S. No. | Type of Structure | No. of Structure | % | HH | % |
|--------------------|-------------------|------------------|-------|-----|-------|
| Residential | | | | | |
| 1 | House | 200 | 68.49 | 160 | 71.75 |
| 2 | Shed | 78 | 26.71 | 53 | 23.77 |
| 3 | Other Residential | 14 | 4.79 | 10 | 4.48 |

| | | | | | |
|-----------------------------------|---|------------|---------------|------------|--------------|
| Total | | 292 | 100.00 | 223 | 100.0 |
| Commercial | | | | | |
| 1 | Shops | 109 | 64.88 | 96 | 62.75 |
| 2 | Hotel | 2 | 1.19 | 2 | 1.31 |
| 3 | Small Eatery | 8 | 4.76 | 8 | 5.23 |
| 4 | Kiosk | 43 | 25.60 | 42 | 27.45 |
| 5 | Farm House | 0 | 0.00 | 0 | 0.00 |
| 6 | Clinic | 1 | 0.60 | 0 | 0.00 |
| 7 | Private Office | 1 | 0.60 | 1 | 0.65 |
| 8 | Other Commercial | 4 | 2.38 | 4 | 2.61 |
| Total | | 168 | 100.00 | 153 | 100.0 |
| Residential cum Commercial | | | | | |
| 1 | Resi+Com | 15 | 100.00 | 13 | 100 |
| Total | | 15 | 100.00 | 13 | 100.0 |
| Other Private | | | | | |
| 1 | Boundary Wall | 18 | 18.95 | 18 | 25.35 |
| 2 | Foundation | 0 | 0.00 | 0 | 0.00 |
| 3 | Cattle Shed | 27 | 28.42 | 23 | 32.39 |
| 4 | Other Temporary (Bathroom, toilet etc.) | 50 | 52.63 | 30 | 42.25 |
| Total | | 95 | 100.00 | 71 | 100.0 |
| Grand Total | | 570 | | 460 | |

98. Type of Construction of Affected Structures

99. The structures being affected in the project are of various types by construction such as temporary, semi-permanent and permanent nature. Out of 552 main structures, 274 (49.6%) structures are of temporary in nature, 222 (40.2%) structures are of semi-permanent nature and 56 (10.1%) are of

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permanent nature. Similarly, there are 18 affected boundary walls and all of them are semi-permanent in nature of construction. The details of type of constructions of the affected structures are summarized in the **Table15**.

Table 15: Type of Construction of Affected Structure

| Sl. No. | Construction Type | No. of Structure | % |
|-----------------------|-------------------|------------------|--------------|
| Main Structure | | | |
| 1 | Temporary | 274 | 49.6 |
| 2 | Semi-Permanent | 222 | 40.2 |
| 3 | Permanent | 56 | 10.2 |
| Total | | 552 | 100.0 |
| Boundary Wall | | | |
| 1 | Semi-Permanent | 18 | 100.0 |
| Total | | | 100.0 |
| Grand Total | | 570 | 100.0 |

100. Age of the Affected Structures

101. As shown in Table 16 below out of total affected structures maximum (79.12 %) were constructed within last 5 years.

Table 16: Age of Affected Structure

| Sl. No. | Age of Structure | No. of Structure | % |
|---------|-----------------------------------|------------------|-------|
| 1 | Up to 5 Years | 451 | 79.12 |
| 2 | Above 5 Years and below 10 Years | 82 | 14.39 |
| 3 | Above 10 Years and below 15 years | 16 | 2.81 |
| 4 | Above 15 Years and below 25 years | 17 | 2.98 |
| 5 | Above 25 Years and below 35 Years | 3 | 0.53 |
| 6 | Above 35 Years | 1 | 0.18 |

| | | |
|--------------|------------|--------------|
| Total | 570 | 100,0 |
|--------------|------------|--------------|

102. Loss of Livelihoods in the Project

103. The census survey revealed that out of total 665 displaced DPs 371 are also losing their livelihood due to loss of productive assets. It was found that 371 DPs losing livelihoods includes 189 owners of agriculture land, 153 owners of commercial structures, 13 owners of residential cum commercial structures and 16 tenants in commercial establishment doing business activity in commercial structures. The details of impact on livelihoods in the project are presented in the **Table 17**.

Table 17: Loss of Livelihoods in the Project

| Sl. No. | Loss | Households | % |
|--------------|--|------------|--------------|
| 1 | Owners of Agricultural Land | 189 | 50.9 |
| 2 | Agricultural Labourer | 0 | 0.00 |
| 3 | Agricultural Tenants/ Leaseholders | 0 | 0.00 |
| 4 | Sharecropper | 0 | 0.00 |
| 5 | Loss of Commercial Structure | 17 | 41.24 |
| 6 | Loss of Residential cum Commercial Structure | 13 | 3.50 |
| 7 | Commercial Tenants | 16 | 4.31 |
| 8 | Employees in Structures | 0 | 0.00 |
| Total | | 371 | 100.0 |

104. Loss of Community Property Resources

105. In terms of community property resources (CPR), 29 structures were reported to be affected. Out of 29 structures, 12 are religious structures (11 temples, and 1 otherlike sacred *chabutra*) and 17 government structures like school, bus stop, amenities and govt. offices. The types of affected CPRs are presented in the **Table 18**, and the list of CPR affected in the project is presented in **Appendix: 3**. CPRs will be compensated either by cash compensation at replacement cost to the community (registered trust, society or village committee as appropriate) or reconstruction of the community structure in consultation with the affected community.

106. CPR repairing and reconstruction will be undertaken by civil works contractors, and the associated costs are incorporated in their contract document.

Table 18 :Type of affected CPR

| Sl. No. | Type of Structure | No. of Structure | % |
|--------------|--|------------------|--------------|
| 1 | Community Structure (Sitting Place etc.) | 0 | 0.00 |
| 2 | Religious Structure (Temple, Shrine, Mosque, etc.) | 12 | 41.38 |
| 3 | Government Structure (School and govt. offices etc.) | 17 | 58.62 |
| Total | | 29 | 100.0 |

107. Loss of Private Trees

108. During census survey 343 trees belong to private owners were also reported to be affected. These include 119 fruit-bearing and 224 non-fruit bearing trees. The details are given in Table 19. The estimation of loss and compensation of private trees will be done by approved valuers from Horticulture Department.

Table 19 :Type of affected Trees

| Sl. No. | Type of Tree | No. of Trees | % |
|--------------|-------------------|--------------|--------------|
| 1 | Fruit Bearing | 119 | 34.69 |
| 2 | Non-fruit Bearing | 224 | 65.31 |
| Total | | 343 | 100.0 |

109. SOCIOECONOMIC INFORMATION AND PROFILE

110. General Socio-economic Profile of DPs

111. There are 665 household (649 owners and 16 tenant households) who will be affected under the subproject. The socio-economic information and findings of 649 households collected through the census survey are presented in the following sections.

112. Number of DPs

113. There are 4563 DPs in total being affected by the project which includes 2619 (57.4%) males and 1944 (42.6%) females. The average household size is 7 and the sex ratio among the DPs is 742. The average household size is quite large because of many joint families and joint ownership. The details of DPs being affected in the project are presented in the Table 20.

Table 20: Number of Displaced Persons