



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.



Engineering, Procurement and Construction (EPC)

Agreement

for

“Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excluding) (Chainage 0+350) - Madhubani (Including) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”

**North Eastern Railway
Gorakhpur**

**Ministry of Railways
Government of India**



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.



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Part I

Preliminary



ENGINEERING, PROCUREMENT AND CONSTRUCTION AGREEMENT

THIS AGREEMENT¹ is entered into on this the day of, 20.....

BETWEEN

- 1 The President of India, represented by Chief Engineer/Construction/I, North Eastern Railway, Gorakhpur, and having its principal offices at North Eastern Railway, Gorakhpur, Uttar Pradesh, 273012 (hereinafter referred to as the “**Authority**” which expression shall, unless repugnant to the context or meaning thereof, include its administrators, successors and assigns) of One Part;

AND

- 2 {.....}², means the selected bidder³ 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 has the responsibility to develop, operate and maintain the Indian Railways in the territorial jurisdiction of the *****⁴ Railway zone⁵.
- (B) The Authority had resolved to [undertake the construction of new railway line between **** and**** in the **** Railway zone] on Engineering, Procurement, Construction (“**EPC**”) basis in accordance with the terms and conditions to be set forth in an agreement to be entered into.
- (C) The Authority had prescribed the Technical and Financial terms and conditions, and invited Request for Participation (RFP) No. -----dated -----from the bidders for undertaking the Project.

¹ Serially numbered footnotes in this Agreement are for guidance of the Authority and should be omitted from the draft EPC Agreement forming part of Bid Documents. Footnotes marked \$ shall be retained in the draft Agreement.

² All provisions enclosed in curly parenthesis shall be retained in the Bid Documents and shall be modified as required after the selected bidder has been identified.

³ Refers to the single entity or the lead member of the Consortium/Joint venture, which is the selected bidder

⁴ All asterisks in this Agreement should be substituted by project-specific particulars in the draft Agreement forming part of the Bid Documents.

⁵ All project-specific provisions in this Standard EPC Agreement have been enclosed in square parenthesis and may be modified, as necessary, before issuing the draft EPC Agreement forming part of Bid Documents.



- (D) After evaluation of the bids received, the Authority had accepted the bid of the selected bidder and issued its Letter of Acceptance No. *** dated *** (hereinafter called the “**LOA**”) to the selected bidder for construction of the above railway line at the Contract Price specified hereinafter, requiring the selected bidder to inter alia:
- (i) deliver to the Authority a legal opinion from the legal counsel of the selected bidder with respect to the authority of the selected bidder to enter into this Agreement and the enforceability of the provisions thereof, within 10 (ten) days of the date of issue of LOA; and
 - (ii) execute this Agreement within 60 (Sixty) 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 and agreements 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:



ARTICLE 1

DEFINITIONS AND INTERPRETATION

1.1 Definitions

The words and expressions beginning with capital letters and defined in this Agreement (including those in Article 26) 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.

1.2 Interpretation

1.2.1 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, labour, delivery, transportation, installation, processing, fabrication, testing, and commissioning of the Railway Project, 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) reference to a “**business day**” shall be construed as reference to a day (other than a Sunday) on which banks in the State 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 “reorganisation” 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, reorganisation, 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, licence or document of any description shall be construed as reference to that agreement, deed, instrument, licence or other document as amended, varied, supplemented, modified or suspended at the time of such reference; provided that this Sub-



clause(s) 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 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 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, Provisos or Schedules in this Agreement shall, except where the context otherwise requires, mean references to Recitals, Articles, Clauses, Sub-clauses, Provisos and Schedules of or to this Agreement; reference to an Annex shall, subject to anything to the contrary specified therein, be construed as a reference to an Annex to the Schedule in which such reference occurs; and reference to a Paragraph shall, subject to anything to the contrary specified therein, be construed as a reference to a Paragraph of the Schedule or Annex, as the case may be, 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 (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.
- 1.2.2 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.
- 1.2.3 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.
- 1.2.4 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

1.4.1 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 EPC 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).

1.4.2 Subject to the provisions of Clause 1.4.1, 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 any value written in numerals and that in words, the latter shall prevail.

{1.5 Joint and several liability

1.5.1 If the Contractor has formed a Consortium/Joint Venture of two or more persons for implementing the Project:

- (a) these persons shall, without prejudice to the provisions of this 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 Consortium/Joint Venture is effected without the prior consent of the Authority.

1.5.2 Without prejudice to the joint and several liability of all the members of the Consortium/Joint Venture, the Lead Member shall represent all the members of the Consortium/Joint Venture and shall at all times be liable and responsible for



discharging the functions and obligations of the Contractor. The Contractor shall ensure that each member of the Consortium/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 liable for the *inter se* allocation of payments among members of the {Consortium/Joint Venture}}.



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Part II

Scope of the Project



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 Railway Project 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 Specifications and Standards set forth in Schedule-D, **with Contractor’s own Material Supplies including Mainline Sleepers, Loop Line Sleepers and Other Line Sleepers, Turnout sleepers, Special sleepers (for SEJ/Guard Rails/LXings), Points (switches) & Crossings with all matching fastening components, Glued Joints, H-beam/Composite sleepers over Girder Bridges, SEJs, Guard rails, Check Rails, fishplates, welding portions, all Signalling, Telecom and Electrification on 2×25kV System/General Electrical works as per laid down specifications.**
- (b) **Rails, except those covered in Clause 2.1(a) above shall be supplied by the Authority free of cost.**
- (c) Performance and fulfilment of all other obligations of the Contractor in accordance with the provisions of this Agreement and matters incidental thereto or necessary for the performance of any or all of the obligations of the Contractor under this Agreement.



ARTICLE 3

OBLIGATIONS OF THE CONTRACTOR

3.1 Obligations of the Contractor

- 3.1.1 Subject to and on the terms and conditions of this Agreement, the Contractor shall undertake the survey, investigation, design, engineering, procurement, and construction of the Railway Project and observe, fulfil, comply with and perform all its obligations set out in this Agreement or arising hereunder.
- 3.1.2 The Contractor shall comply with all Applicable Laws and Applicable Permits (including renewals as required) in the performance of its obligations under this Agreement.
- 3.1.3 Save and except as otherwise provided in this Agreement or Applicable Laws, as the case may be, the Contractor shall, in discharge of all its obligations under this Agreement, conform with and adhere to Good Industry Practice at all times.
- 3.1.4 The Contractor shall remedy any and all loss or damage to the Railway Project, occurring on or after the Appointed Date and until the date of Provisional Certificate, with respect to the Works completed prior to the issuance of the Provisional Certificate and/or Completion Certificate, with respect to the Works referred to in the Punch List, at its own cost, save and except to the extent that any such loss or damage shall have arisen from any default of the Authority or on account of a Force Majeure Event in which case the provisions of Article 19 shall apply.
- 3.1.5 The Contractor shall remedy any and all loss or damage to the Railway Project during the Defects Liability Period at its own cost, to the extent that such loss or damage shall have arisen out of the reasons specified in Clause 15.3.
- 3.1.6 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-E and obtain and keep in force and effect such Applicable Permits in conformity with Applicable Laws;
 - (b) procure, as required, the appropriate proprietary rights, licences, agreements and permissions for Materials, methods, processes, know-how and systems used or incorporated into the Railway Project;
 - (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 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) always act in a manner consistent with the provisions of this Agreement and not cause or fail to do any act, deed or thing, whether intentionally or otherwise, which may in any manner be in violation of any of the 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 Applicable Laws and Good Industry Practice;
- (h) keep, on the Site, a copy of this Agreement, publications named in this Agreement, the Drawings, Documents relating to the Project, Change of Scope Orders and other communications sent under this Agreement, and provide access to all these documents at all reasonable times to the Authority Engineer and its authorised personnel;
- (i) cooperate with other contractors employed by the Authority and with personnel of any other 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 the existing facilities within the Right of Way, irrespective of whether they are public or in the possession of the Authority or of others.
- (k) to provide reasoned comments on any information relating to the contractor’s activities under or pursuant to the agreement, which the Authority may publish.

3.1.7 The Contractor shall undertake all necessary superintendence to plan, arrange, direct, manage, inspect and test the Works.

3.2 Obligations relating to sub-contracts and any other agreements

3.2.1 The Contractor shall not sub-contract the works comprising more than **40% (forty percent)** of the Contract Price and shall carry out works for at least **60% (sixty per cent)** of the total Contract Price directly under its own supervision and through its own personnel. The Parties expressly agree that for the purpose of computing the value of sub-contracts under this Clause 3.2.1, the Contract Price shall exclude any sub-contract for the procurement of goods and equipment line [rails, sleepers and track fittings, signalling and telecommunication & Power supply equipment]. The Parties agree that all obligations and liabilities under this Agreement for the entire Railway Project shall at all time remain with the Contractor. {The Parties agree that works equal to at least 30% (thirty per cent) of the Contract shall be discharged solely by the Lead Member.} ^{\$}.

^{\$} May be deleted if the Contractor is not a Consortium/Joint Venture.



Procurement of material, hire of equipment or engagement of labour by prime contractor or procuring entity will not mean sub-contracting.

- 3.2.2 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. Provided, however, that in any event the Contractor shall communicate the name and particulars to the Authority for any sub-contract including the relevant experience 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 and shall have no claim whatsoever on this account.
- 3.2.3 Without prejudice to the provisions of Clause 3.2.2, in the event any sub-contract referred to in Clause 3.2.2 relates to a sub-contractor who has, over the preceding 3 (three) financial years and the current financial year, 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 80% (eighty per cent) of such contract, 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.
- 3.2.4 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 hereunder.
- 3.2.5 Notwithstanding anything to the contrary contained in this Concession Agreement, the Concessionaire agrees and acknowledges that it will not assign any work to any contractor/sub-contractor from a country which shares a land border with India unless such contractor/sub-contractor is registered with the competent Authority. Concessionaire will ensure that such Contractor/sub-contractor fulfils all requirements in this regard and is eligible to be considered (evidence of valid registration by the competent authority is enclosed). The Competent Authority for registration will be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT), India.
- 3.2.6 Contractor shall be liable for the regular payment to the sub-Contractor.
- 3.2.7 Contractor in each Interim payment certificate (IPC) reflect the amount of payment to be paid to the Sub-Contractor. The invoices raised by Sub-Contractor for his bill shall be submitted along with IPC, duly attested by the Sub-Contractor.
- 3.2.8 In the subsequent Interim Payment Certificate (IPC), the Contractor shall submit a certificate of Sub-Contractor that they have received the bill amount of previous stage payment statement.



- 3.2.9 In case of dispute over sum of amount to be paid to the sub-Contractor or non-payment to Sub-Contractor, Authority Engineer may raise the issue to the Contractor. After, issue has been raised, Contractor shall resolve the issue within 10 days. In case issue is not resolved, *Authority Engineer shall pay payment due as decided by authority*, to the Sub-Contractor from the forthcoming IPC of Contractor.

3.3 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 and will always be of 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 Force Majeure Event, and shall not in any manner excuse the Contractor from the performance and discharge of its obligations and liabilities under this Agreement.

3.4 Contractor’s personnel

- 3.4.1 The Contractor shall ensure and procure that the personnel engaged by it or by its Sub-contractors for performance of its obligations under this Agreement are at all times appropriately qualified, skilled and experienced in their respective functions including in conformity with Applicable Laws including the Indian Railway General and Subsidiary Rules, [the Indian Electricity Rules], and Good Industry Practice.
- 3.4.2 The Authority 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 from the Railway Project. Provided, any such direction issued by the Authority Engineer shall specify the reasons for the removal of such person.
- 3.4.3 The Contractor shall, on receiving a direction from the Authority Engineer under the provisions of Clause 3.4.2, ensure and procure the removal of such person or persons from the Railway Project with immediate effect. The Contractor shall further ensure that such persons have no further connection with the Railway Project.
- 3.4.4 The Contractor shall be responsible for the Security of the Work Site and for keeping the unauthorized persons off the Site.

3.5 Advertisement on Railway Project

The Contractor shall not use the Railway Project or any part thereof in any manner for branding or advertising purposes including for advertising any commercial product or services or companies.

3.6 Contractor’s care of the Works

The Contractor shall bear full risk in and take full responsibility for the care of Works, and of Materials, goods and equipment for incorporation therein, on and from the Appointed Date and until the date of Provisional Certificate, with respect to the Works completed prior to the issuance of the Provisional Certificate and/or



Completion Certificate, with respect to the Works referred to in the Punch List, save and except to the extent that any such loss or damage shall have arisen from any default or neglect of the Authority.

3.7 Electricity, water and other services

The Contractor shall be responsible for procuring of all power, water and other services that it may require for the Railway Project.

3.8 Unforeseeable difficulties

Except as otherwise specified 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.

For the purposes of this Clause, unforeseeable difficulties include natural physical conditions including sub-surface and hydrological conditions which the Contractor encounters at the Site during execution of the Works.

3.9 Training of Authority’s personnel

3.9.1 The Contractor shall provide and complete the training to the personnel of the Authority in diagnostic, trouble shooting, repairing, operation and maintenance of the signalling and telecommunication equipment. The number of persons to be trained shall not exceed [6 (six)] and the period of training shall be for a period of 4 (four) weeks. The training shall be completed before the issuance of the Provisional Certificate/ Completion Certificate. Before the issue of any handing-over certificate, the final O& M Manuals, wherever required, shall be submitted by the contractor to the Authority Engineer.

3.9.2 Deleted.

3.10 Safety at work site

The Contractor and its sub-contractors shall follow the safety instructions and take all safety measures for workmen and vehicles plying in the work area in accordance with Applicable Laws, Good Industry Practice and the provisions of this Agreement.



ARTICLE 4

OBLIGATIONS OF THE AUTHORITY

4.1 Obligations of the Authority

- 4.1.1 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.
- 4.1.2 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.
- 4.1.3 The Authority shall, upon receiving the Performance Security under Clause 7.1.1, provide to the Contractor:
- (a) the Right of Way in accordance with the provisions of Clauses 8.2 and 8.3 on no less than 95% (ninety five per cent) of core land length and 90% (ninety percent) of non-core land length of the total length of the Railway Project before appointed date;
 - (b) all environmental and forest clearances as required under Clause 4.3⁷ before appointed date; and
 - [(c) approval of the general arrangement drawings (the “GAD”) from concerned authorities to enable the Contractor to construct road over-bridges, under-bridges and canal crossings on the Railway Project in accordance with the Scope, Specifications and Standards, and subject to the terms and conditions specified in such approval, within a period of 60 (sixty) days from the Appointed Date.]⁸
- 4.1.4 In the event that (i) the Authority does not procure fulfilment of any or all of the obligations set forth in Clause 4.1.3 within the period specified in respect thereof, and (ii) the delay has not occurred as a result of breach of this Agreement by the Contractor or due to Force Majeure, the Authority shall pay to the Contractor Damages in a sum calculated in accordance with the provisions of Clause 8.3 of this Agreement and grant Time Extension in accordance with the provisions of Clause 10.4.

[For the avoidance of doubt, the Parties agree that the Damages for delay in approval of GAD by the road authorities for a particular railway over-bridge or a railway under-bridge or a canal crossing shall be deemed to be equivalent to the Damages payable under the provisions of Clause 8.3 for delay in providing Right of Way for a

⁷Clause 4.1.3(b) may be suitably modified in the event that all the environmental clearances for the Project Railway have been received or are not required. It should be clearly stated that all the environmental clearances for the Project Railway have been received; or such environmental clearances for the Project Railway are not required.

⁸Clause (c) may be omitted if the Project does not include a road over-bridge/under-bridge.



length of 1 (one) kilometre for each such railway over-bridge or railway line under-bridge or canal crossings, as the case may be.]

- 4.1.5 Notwithstanding anything to the contrary contained in this Agreement, the Parties expressly agree that the aggregate Damages payable by the Authority under Clauses 4.1.4, 4.4.3, 8.3 and 9.2 shall not exceed 5% (five 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 Railway Project.
- 4.1.6 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 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 favourable than those generally available to commercial customers receiving substantially equivalent services;
 - (c) procure that no barriers that would have a material adverse effect on Works are erected or placed on or about the Railway Project by any Government Instrumentality or persons claiming through or under it, except for reasons of Emergency, national security or law and order;
 - (d) not do or omit to do any act, deed or thing which may in any manner be in violation of any of the provisions 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 3.3, provide reasonable assistance to the Contractor and any expatriate personnel of the Contractor or its Sub-contractors to obtain applicable visas and 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.

4.2 Maintenance and operation of the existing facilities

The Authority shall undertake the maintenance of the facilities existing prior to the Appointed Date including railway lines, bridges, structures, electrical, signaling and communications works within the Right of Way.



4.3 Environmental and Forest Clearances

The Authority represents and warrants that the environmental and forest clearances of Land mentioned in clause 4.1.3 (a) will be obtained before Appointed Date. In the event of any delay, the Contractor shall be entitled to Time Extension for the period of such delay in accordance with the provisions of Clause 10.4 of this Agreement and shall also be entitled to Damages calculated as if the Right of Way for and in respect of such sections of the Railway Project has not been provided in accordance with the provisions of Clause 8.2 and as a consequence thereof, the Contractor shall be entitled to Damages under and in accordance with the provisions of Clause 8.3. For the avoidance of doubt, the present status of environmental and forest clearances is specified in Schedule-A.⁹

4.4 Machinery and equipment

4.4.1 The Authority shall upon receiving a request from the Contractor, provide the machinery and equipment specified in Schedule P on payment of hire charges at the monthly/daily/per KM rates specified therein. The Parties agree that the monthly/daily/per KM rate for each machine or equipment shall be exclusive of fuel but inclusive of all other operating charges, monthly rates shall be converted into daily rates taking a month comprising 25 (twenty five) working days. The Parties further agree that for each machinery or equipment:

- (a) The charges shall be payable for a day even if a machine or equipment is used for less than 8 (eight) hours, so long as it has been placed at the disposal of the Contractor and has not been withdrawn;
- (b) the daily rates shall be computed for a shift of 8 (eight) hours taken as one day. By way of illustration, if the machinery or equipment is used for 16 (sixteen) hours on any day, the charges payable shall be equal to twice the daily rate; and
- [(c) for any machinery or equipment which can be used only during the period of a Power Block or Traffic Block, no payment shall be due or payable for the day on which such block is not provided to the Contractor.]

4.4.2 The Contractor shall by notice of at least three weeks convey to the Authority the particulars of the machinery and equipment required for each day of the following one month.

4.4.3 In the event that the Authority does not provide any machinery and equipment at the designated time in pursuance of the provisions of Clause 4.4.1, the Contractor shall be entitled to Damages in an amount equal twice the rates specified in Schedule-P.

⁹Clause 4.3 may be suitably modified in the event that all the environmental/forest clearances for the Project Railway have been received or are not required. It should be clearly stated that all the environmental/forest clearances for the Railway Project has been received; or such environmental/forest clearances for the Railway Project are not required.



Provided further that the Contractor shall be entitled to Time Extension in accordance with the provisions of Clause 10.4 if the number of days for which the machinery has not been provided continuously exceeds 7 (seven) and/ or the total number of days of not providing the machinery exceed 15 (fifteen) days in a period of 03 months.¹⁰

[4.5 Electricity transmission lines

The Authority shall procure the Applicable Permits and right of way for the erection, installation, and energisation of the transmission lines required for operating the Railway Project.]¹¹

4.6 Disconnection for modification of existing signalling and telecommunication works

The Contractor shall on requirement of disconnection of a particular subsystem for modification in the existing signalling and telecommunication system at railway stations, level crossing gates and interlocked sections, inform the Authority Engineer by notice of at least one week of its readiness for commissioning and the Authority Engineer shall obtain the requisite approvals from the Authority for the required disconnections. All such work requiring disconnection of existing signalling systems shall be executed under supervision of Authority Engineer or his representative. The Parties expressly agree that in the event of any default in providing such disconnection, the Authority shall pay to the Contractor Damages at the rate of Rs.1,000 (Rupees one thousand) per day. The Contractor shall ensure that there is no interruption/ disturbance to operational circuits in such cases of modification of signalling and telecom systems.

[4.7 Provision of Power Blocks and Traffic Blocks

- 4.7.1 The Authority shall provide Power Block or Traffic Block or both to enable the Contractor to undertake the construction of overhead equipment, or such other work as may be determined by the Authority Engineer.
- 4.7.2 The Contractor shall, in consultation with the Authority Engineer, submit a weekly programme of Blocks, commencing from Monday, with a notice of at least 1 (one) week and the Authority Engineer shall convey the approved weekly programme to the Contractor no less than 3 (three) days prior to the start of such week.
- 4.7.3 The minimum period for which a Power Block or Traffic Block shall be provided to the Contractor shall not be less than two hours, period being counted from the time the track is placed at the disposal of the Contractor and until it is cleared by the Contractor. Provided, however, that a Power Block or Traffic Block, as the case may be, of shorter duration may be provided with mutual consent of the Parties.
- 4.7.4 The aggregate period of Power Block and Traffic Block to be provided to the Contractor during the Construction Period is specified in Schedule-O. The Contractor shall organise its work so as to complete all Construction Works within such aggregate period. However, this aggregate period may be increased by the

¹⁰Delete if not applicable.

¹¹Delete if not applicable.



Authority Engineer on Contractor’s request, if the same is considered justified and reasonable under the prevailing circumstances.

- 4.7.5 In the event of any change in the schedule of Power Block or Traffic Block or both, as the case may be, the Authority shall inform the Contractor by a notice of not less than 24 (twenty four) hours. Provided, however, that no such notice shall be required in case of a breakdown, accident, law and order disturbance, natural calamity or any other unusual occurrence or Emergency.
- 4.7.6 In the event a Power Block or Traffic Block, as the case may be, is not provided for any day in accordance with the confirmed programme, the Contractor shall be compensated by providing an additional Power Block or Traffic Block of equal time during the same week or the following week. The Parties expressly agree that in the event of any default in providing such additional blocks for compensating the Contractor, the Authority shall pay to the Contractor Damages at the rate of Rs.1,000 (Rupees one thousand) per day for each hour which has not been provided as required hereunder and until such hour is provided during any of the 6 (six) following weeks.
- 4.7.7 The Contractor shall be entitled to undertake the Construction Works within the aggregate period specified in Schedule-O. Provided, however, that in the event the aggregate period utilised by the Contractor exceeds the period specified in Schedule-O and the extra time granted thereto under clause 4.7.4 if any, the Contractor shall pay to the Authority hourly charges at the rate specified therein.]



ARTICLE 5

REPRESENTATIONS AND WARRANTIES

5.1 Representations and warranties of the Contractor

The Contractor represents and warrants to the Authority that:

- (a) it is duly organised 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 other actions under Applicable Laws to authorise 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 obligations 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 there under including any obligation, liability or responsibility hereunder;
- (e) the information furnished in the Bid 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, result in the breach of, 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) all information provided by the {selected bidder/ members of the Consortium/Joint Venture} in response to the RFP or otherwise, is to the best of its knowledge and belief, true and accurate in all material respects; and
- (m) 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.

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 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 shall have procured, as on the Appointed Date, Right of Way and environment clearances such that the Contractor can commence construction forthwith on 95% (ninety five percent) of the core land length and 90% of non-core land length of the Railway Project.

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 of either Party under this Agreement.



ARTICLE 6

DISCLAIMER

6.1 Disclaimer

- 6.1.1 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 (RFP), Scope of the Project, Specifications and Standards, 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 4.1.2 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.
- 6.1.2 The Contractor acknowledges and hereby accepts to have satisfied itself as to the correctness and sufficiency of the Contract Price.
- 6.1.3 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 6.1.1 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.
- 6.1.4 The Parties agree that any mistake or error in or relating to any of the matters set forth in Clause 6.1.1 above shall not vitiate this Agreement, or render it voidable.
- 6.1.5 In the event that either Party becomes aware of any mistake or error relating to any of the matters set forth in Clause 6.1.1 above, that Party shall immediately notify the other Party, specifying the mistake or error.
- 6.1.6 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.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Part III

Construction



ARTICLE 7

PERFORMANCE SECURITY

7.1 Performance Security¹²

- 7.1.1 Contractor shall, for the performance of its obligations hereunder, provide to the Authority, within 30 (Thirty) days of issue of LOA, Performance security in the form of Insurance Surety Bond*/account payee demand draft/fixed deposit receipt from a commercial bank/online payment in an acceptable form/an irrevocable and unconditional Bank Guarantee/e-BG (the “Performance Security”), for an amount equal to 5% (five percent) of the Contract Price **and additional performance security as per para 7.1.4** from a Bank in the form set forth in Annex-I/IA of Schedule-F. In the case of eBG, the declaration to be furnished by Banks for issuance of eBG as per Annex-IV of Schedule-F.

The Performance Security shall be valid until 60 (sixty) days of the expiry of the Defects Liability Period specified in Clause 15.1.1. Until such time the Performance Security is provided by the Contractor pursuant here to 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. For the avoidance of doubt, the Parties expressly agree that the Contractor shall provide, no later than 30 (thirty) days prior to the expiry of the Performance Security for the Defects Liability Period specified in Clause 15.1.1, a Performance Security in respect of the extended Defects Liability Period, as specified in Clause 15.1.2, for an amount equal to 5% (five percent) of the estimated cost of the Structures, Important Bridges, if any, comprising a new technology not currently in use in the Railway and the interlocking and telecom switching equipment as specified in Schedule B.

***Note: In case PC is in lieu of Insurance Surety Bond:** In case of extension of Date of Completion, selected bidder needs to submit extended Insurance Surety Bond / Fresh Insurance Surety Bond / fresh Performance Security in any form as given above before expiry of existing Insurance Surety Bond.

- 7.1.2 Notwithstanding anything to the contrary contained in this Agreement, the Parties agree that in the event of failure of the Contractor to provide the Performance Security in accordance with the provisions of Clause 7.1.1 and within the time specified therein or such extended period as may be provided by the Authority, in accordance with the provisions of Clause 7.1.3, the Authority shall encash the Bid Security and appropriate the proceeds thereof as part-Damages, and thereupon all rights, privileges, claims and entitlements of the Contractor under or arising out of this Agreement shall be deemed to have been waived by, and to have ceased with the concurrence of the Contractor, and this Agreement shall be deemed to have been terminated by mutual agreement of the Parties along with further levy of the Liquidated Damages equivalent to the stipulated ‘Performance Security’, which shall be recoverable from contractor’s pending/future dues with IR in any of the

¹²This is different from Retention Money



ongoing/future contracts.

- 7.1.3 In the event the Contractor fails to provide the Performance Security within 30 (Thirty) days of the issue of LOA as provided in Clause 7.1.1 above, the contractor may seek extension of time for a period not exceeding a further 30(thirty) days on payment of damages for such extended period equivalent to a sum calculated at the rate of 0.01%(zero point zero one percent) of the Contract Price for each day until the Performance Security is provided.(i.e. from 31st day to 60th day).
- 7.1.4 If a tender is accepted below the advertised tender value, an additional performance security shall be submitted by the bidder as below:

Bid Quoted in % of advertised cost	Additional Performance Guarantee (%)
Below 0-5% (inclusive)	Nil
Below 5%	5%

7.2 Extension of Performance Security

The Contractor may initially provide the Performance Security for a period of 2 (two) years; provided that it shall procure the extension of the validity of the Performance Security, as necessary, at least 2 (two) months prior to the date of expiry thereof. Upon the Contractor providing an extended Performance Security, the previous Performance Security shall be deemed to be released and the Authority shall return the same to the Contractor within a period of 7 (seven) business days from the date of submission of the extended Performance Security.

7.3 Appropriation of Performance Security

- 7.3.1 Upon occurrence of a Contractor Default, the Authority shall, without prejudice to its other rights and remedies hereunder or in law, be entitled to encash and appropriate from the Performance Security the amounts due to it as Damages for the Contractor Default.
- 7.3.2 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 21. Upon such replenishment or furnishing of a fresh Performance Security, as the case may be, the Contractor shall be entitled to an additional Cure Period of 30 (thirty) days for remedying the Contractor 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 21.

7.4 Release of Performance Security

The Authority shall release the Performance Security within 60 (sixty) days of the expiry of the Defects Liability Period or the extended Defects Liability Period, as the case may be, 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 or the extended Defects Liability Period, as the case may be, have been rectified.

7.5 Retention Money¹³

- 7.5.1 From every payment for Works due to the Contractor in accordance with the provisions of Clause 17.5, 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.
- 7.5.2 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 as Damages for such Contractor’s Default.
- 7.5.3 The Contractor may, upon furnishing an irrevocable and unconditional bank guarantee substantially in the form provided at Annex-II of Schedule-For FDR/Insurance surety bonds, require the Authority to refund the Retention Money deducted by the Authority under the provisions of Clause 7.5.1. Provided that the refund hereunder shall be made in tranches of not less than 0.5% (zero point five percent) of the Contract Price. Further, the Retention money may be deposited as Bank Guarantee, issued by Scheduled commercial Bank or FDR/Insurance surety bonds after signing of Contract Agreement, but before payment of first payment bill. Provided further that validity of Bank Guarantee shall be extended from time to time depending upon extension of Contract granted.
- 7.5.4 Within 15 (fifteen) days of the date of issue of the Completion Certificate, the Authority shall discharge the bank guarantees, if any, furnished by the Contractor under the provisions of Clause 7.5.3 and refund the balance of Retention Money remaining with the Authority after adjusting the amounts appropriated under the provisions of Clause 7.5.2 and the amounts refunded under the provisions of Clause 7.5.3.
- 7.5.5 The Parties agree that in the event of Termination of this Agreement, the Retention Money and the bank guarantees 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 21.6.

¹³This is different from Performance Security



ARTICLE 8

RIGHT OF WAY

8.1 The Site

The site of the Railway Project (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 plan, Longitudinal section, Yard Plans/ESP and electrification sectioning diagram] finalised by the Authority and attached with this document, free from all encroachments and encumbrances, and free access thereto for the execution of this Agreement;

[This Right of Way will not include completely free access to locations where working may affect safety of train traffic (i.e. relay room, locations boxes etc). In such cases, right of work will be arranged by the Authority Engineer on written request made by contractor at least 7 days in advance, if such request is reasonable.]

- (b) obtaining environmental clearance and forest clearance for the Railway Project.

8.2 Handing over of the Project Site

- 8.2.1 The Authority Representative and the Contractor shall, within 15 (fifteen) days of providing the Performance Security by the Contractor in accordance with the provisions of Clause 7.1, jointly inspect the Site and prepare a joint memorandum containing an inventory of the Site including the vacant and unencumbered land, buildings, structures, road/ railway works, trees and any other immovable property on or attached to the Site. Subject to the provisions of Clause 8.2.3, such 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. Signing of the memorandum, in 2 (two) counterparts (each of which shall constitute an original), by the authorised representatives of the Parties shall be deemed to constitute a valid evidence of handing over of 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.

For the avoidance of doubt, the Parties agree that subject to the provisions of Clauses 8.2.2 and 8.2.3, whenever the Authority is ready to provide Right of Way for any part or parts of the Site included in the “**Appendix**”, it shall by notice inform the Contractor, of the proposed date and time when the Authority Representative and the Contractor shall inspect the specified parts of the Site, and prepare a memorandum which shall be deemed to constitute a valid evidence of handing over of such Right of Way to the Contractor in accordance with the provisions of this Clause 8.2.1.

- 8.2.2 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 8.2.1. For the avoidance of doubt, the Parties expressly agree that the Appendix shall in no event contain Sections of the Railway Project the cumulative length of which exceeds 5% (Five per cent) of the core land length and 10% (Ten per cent) of the non-core land length of the Railway Project.

- 8.2.3 The Authority shall provide the Right of Way to the Contractor, in respect of the land included in the Appendix, by the date specified in Schedule-A for each part of the Site referred to therein, but in no case later than 180 (one hundred and eighty) days of the Appointed Date, 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.

8.3 Damages for delay in handing over the Site

- 8.3.1 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 grant a suitable extension to time and no damages will be paid to the contractor.

In the event that any Damages are due and payable to the Contractor under the provisions of this Clause 8.3.1 for delay in providing the Right of Way, the Contractor shall, subject to the provisions of Clause 10.4, be entitled to Time Extension equal to the period for which the Damages have become due and payable under this Clause 8.3.1, 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 10.4 shall be restricted only to failure of the Authority to provide the Right of Way for and in respect of the width of the Site required for Works in accordance with the Good Industry Practice.

- 8.3.2 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 is granted within 180 (one hundred and eighty) days of 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 8.3.1.
- 8.3.3 Notwithstanding anything to the contrary contained in this Agreement, the Authority may at any time withdraw any part of the Right of Way and the Works forming part of this Agreement, subject to such Works not exceeding an aggregate value, such value to be determined in accordance with Schedule-G, equal to 5% (five per cent) of the Contract Price.

Provided that if Right of Way has not been provided within 240 (two hundred and forty) days of the Appointed Date, for commencing construction on any part of the



Site included in the Appendix, the affected Works shall be deemed to be withdrawn under the provisions of this Clause 8.3.3 unless the Parties agree to the contrary, and such Works shall not be computed for the purposes of the aforesaid ceiling of 5% (five per cent) of the Contract Price hereunder. For the avoidance of doubt, the Parties agree that such deemed withdrawal of Works hereunder shall be without prejudice to the Contractor’s entitlement to Damages under Clauses 4.1.4, 8.3 and 9.2.

- 8.3.4 In the event of withdrawal of Works under Clause 8.3.3, including deemed withdrawal of Works, the Contract Price shall be reduced by an amount equal to 95% (ninety five per cent) of the value of the Works withdrawn and the Contractor shall not be entitled to any other compensation or Damages for the withdrawal of Works, including their deemed withdrawal, save and except for Damages as provided under Clause 4.3.

Provided that if any Works are withdrawn after commencement of the Construction of such Works, the Authority shall pay to the Contractor 100% (one hundred) of the fair value of the work done, as assessed by the Authority Engineer:

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 on account 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 8.2.1, and until the issue of the Provisional Certificate, the Contractor shall maintain a round-the-clock vigil over the Site and shall ensure and procure that no encroachment thereon takes place. 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 interest 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 Railway Project and the performance of its obligations under this Agreement.

8.7 Access to the Authority and the Authority Engineer

- 8.7.1 The Right of Way given to the Contractor hereunder shall always be subject to the right of access of the Authority and the Authority Engineer and their employees and agents for inspection, viewing and exercise of their rights and performance of their obligations under this Agreement.
- 8.7.2 The Contractor shall ensure, subject to all relevant safety procedures, that the Authority has unrestricted access to the Site during any Emergency.

8.8 Geological and archaeological finds

It is expressly agreed that mining, geological or archaeological rights do not form part of this Agreement with the Contractor for the Works, and the Contractor hereby acknowledges that it shall not have any mining rights or interest in the underlying minerals, fossils, antiquities, structures or other remnants or things either of particular geological or archaeological interest and that such rights, interest and property on or under the Site shall vest in and belong to the Authority or the concerned Government Instrumentality. The Contractor shall take all reasonable precautions to prevent its workmen or any other person from removing or damaging such interest or property and shall inform the Authority forthwith of the discovery thereof and comply with such instructions as the Authority or the concerned Government Instrumentality may reasonably give for the removal of such property. For the avoidance of doubt, it is agreed that any reasonable expenses incurred by the Contractor hereunder shall be reimbursed by the Authority. It is also agreed that the Authority shall procure that the instructions hereunder are issued by the concerned Government Instrumentality within a reasonable period.



ARTICLE 9

UTILITIES AND TREES

9.1 Existing utilities and roads

Notwithstanding anything to the contrary contained herein, the Contractor shall 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.

- 9.1.1** The works of shifting of utility(ies) owned by Railways and already communicated to Contractor as part of Tender document shall be part of schedule-G. List of utilities (Railway owned or other) is being made available to the contractor as part of Tender document. However, the contractor shall have to conduct the inspection/investigation of the utilities before execution of the work independently.
- 9.1.2** Diversion of utility(ies) not owned by Railways or not communicated to Contractor as part of Tender document shall be payable under BOQ items of relevant Schedule-G1
- 9.1.3** List of utilities (Railway owned or other) is being made available to the contractor as part of Tender document. However, the contractor shall have to conduct the inspection/investigation of the utilities before execution of the work independently.

9.2 Shifting of obstructing utilities

- 9.2.1** The Contractor shall, in accordance with Applicable Laws and with the proactive support & assistance of the Authority, cause shifting of utility(ies) as per 9.1.2 (including electric lines, water pipes and telephone cables) to an appropriate location or alignment, if such utility or obstruction adversely affects/ infringes the execution of Works in accordance with this Agreement. The utilities are to be diverted with proper liaison and approval of the utility owning agencies. NOC & Approval of schemes of Diversion of Utilities from the concerned regulatory /statutory / Local Authority is the responsibility of the Contractor. Cost of such utility shifting unless otherwise specified will be paid separately under relevant item of BOQ (Schedule G1B). No claim on account of delay in execution of utility diversion will be entertained.
- 9.2.2** For the existing utilities owned by Railways, where the shifting thereof can take place only after certain works for enabling its shifting have been completed by the Contractor, the Authority shall, undertake and complete its shifting within 180 (one hundred and eighty) days after the Contractor has notified the Authority of the completion of the enabling works. In the event of delay in shifting the utility, beyond the aforesaid period of 180 (one hundred and eighty) days, the Contractor shall be entitled to Damages for the period of delay in accordance with the provisions of this Clause 9.2.1.



- 9.2.3 The utilities which are not to be diverted, proper supporting shall be done to prevent any damage. No payment shall however be made for supporting and protecting the utilities during execution of the work. All temporary diversion of any utilities done to facilitate the construction activity shall be the part of the schedule G.

9.3 New utilities

- 9.3.1 The Contractor shall allow, subject to such conditions as the Authority may specify, access to, and use of the Site for laying telephone lines, water pipes, electric 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 Railway Project in accordance with this Agreement and any damage caused by such use shall be restored forthwith at the cost of the Authority.
- 9.3.2 In the event the 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 in accordance with Clause 10.4 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.

9.4 Felling of trees

The Authority shall obtain the Applicable Permits for felling of trees to be identified by the Authority for this purpose if and only if such trees cause a Material Adverse Effect on the construction of the Railway Project. The cost of such felling and of the compensatory plantation of trees, if any, shall be borne by the Authority. 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 part 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; and for any period of delay in providing the Applicable Permits, the Contractor shall be entitled to Damages and Time Extension as provided under Clause 9.2.1.



ARTICLE 10

DESIGN AND CONSTRUCTION OF THE RAILWAY PROJECT

10.1 Obligations prior to commencement of Works

10.1.1 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, Applicable Laws and Applicable Permits; and
- (d) make its own arrangements for quarrying and procurement of materials needed for the Railway Project under and in accordance with Applicable Laws and Applicable Permits.

10.1.2 The Authority shall, within 15 (fifteen) days of the date of this Agreement, appoint an engineer (the “**Authority Engineer**”) 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 Engineer forthwith.

10.1.3 Within 30 (thirty) days of the Appointed Date, the Contractor shall submit to the Authority and the Authority Engineer a programme/CPM Charts & Bar Charts (the “**a Resource loaded Programme**”) for construction of Works, developed using networking techniques and giving the following details:

Part I Contractor’s organisation for the Project, the project execution plan indicating arrangements for design and construction i.e. engagement of design consultants, project phasing and sub-contracting etc., environmental management plan, Quality Assurance Plan including design quality plan, traffic management and safety plan covering safety of users and workers during construction, Contractor’s key personnel, and equipment.

In case of non- submission of documents beyond 30 days from appointed date the damages shall be imposed as under –

- a) QAP which includes design quality plan, MTP, ITP etc. @ Rs. 25,000/- per day
- b) Environmental management plan @ Rs. 10,000/- per day
- c) Method Statement @ Rs. 10000/- per method statement per day.



Part II Programme for completion of all stages of construction given in Schedule-G and Project Milestones of the Works as specified in Project Completion Schedule set forth in Schedule-I. The Programme shall include:

- (a) the order in which the Contractor intends to carry out the Works, including the anticipated timing of design and stages of Works;
- (b) the periods for reviews under Clause 10.2; and
- (c) the sequence and timing of inspections and tests specified in this Agreement.

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

Part III Monthly cash flow forecast for the Project

Provided, however, that the Authority may, within a period of 21 (twenty-one) days of receipt of the Programme, convey its comments to the Contractor stating the modifications, if any, required for compliance with the provisions of this Agreement, and the Contractor shall carry out such modifications, to the extent required for conforming with the provisions of this Agreement.

Part IV Monthly account of resources (Men and Machinery) proposed to be deployed to complete the milestone/contract in specified time. Failure to deploy the resources will make contractor liable for penalty as decided by authority. The penalties so recovered can be refunded if the contractor make good the resources and achieve next milestone.

The Contractor shall submit a revised resource loaded programme whenever the previous programme is inconsistent with the actual progress or with the Contractor's obligation.

10.1.4 The Contractor shall plan the project work by keeping Schedule-G and G1 into consideration in order to maximise the cash flow and progress. However, the Authority Engineer may modify/break up any of the stage payment schedule (payment milestones) during execution if the same is considered essential to speed up the progress or if the contractor is not able to achieve a particular payment milestone due to the reasons/delays attributable to the Authority or due to the factors beyond the control of Contractor or to any unforeseen circumstances.

10.1.5 Procurement of items should be planned by the Contractor in consultation with the Authority Engineer. Procurement plan should be prepared in such a manner that those materials which have limited shelf life may be procured in a staggered manner so that materials are utilised/consumed well before its expiry. If the material/product does not remain of required specifications at the time of its actual use, the same will be replaced by the Contractor with materials conforming to Specifications at his own cost.



10.2 Design and Drawings

10.2.1 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 or unforeseen issues, the alternative design criteria for such section shall be provided for review/approval of the Authority Engineer.

10.2.1A In case Contractor is not having in house design team then - The Contractor shall appoint a “Design Consultant” at its cost after proposing to the Authority a panel of 3 (three) names of qualified, reputed and experienced firms and Authority will select one Design Consultant from the above panel, provided, however, that if none of the name proposed in the panel is 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 3 (three) more names for obtaining the consent of the Authority. The Contractor shall also obtain the consent of the Authority for two key personnel of the Design Consultant who shall have adequate experience and qualifications with respect to the main components of the Railway Project. The Authority shall, within 30 (thirty) days of receiving a panel from the Contractor, either 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 Design Consultant of its own choice. For the avoidance of doubt, the Parties agree that no firm or person having any conflict of interest shall be engaged for this purpose. The Parties further agree that any assignments completed at least three years prior to the appointment hereunder shall not be reckoned for the purposes of conflict of interest.

10.2.2 The **Railway** shall appoint a proof checking consultant at its cost (the “**Proof Consultant**”). For the avoidance of doubt, **it must be ensured that** no firm or person having any conflict of interest shall be engaged for a **Proof checking consultant**.

10.2.3 The Proof Consultant shall:

- (a) evolve a systems approach with the Design Director so as to minimise the time required for approval of final designs and construction drawings; and
- (b) examine the designs expeditiously and wherever necessary raise observations/ seek clarifications etc. as deemed appropriate and refer back the drawings within 15 days for rectifications/clarifications, and finally proof check and endorse/counter-sign the detailed calculations, drawings and designs, which have been approved by the Design Director.

10.2.4 In respect of the route control chart, the following shall apply:

- (a) route control chart
 - (i) The Contractor shall prepare and submit to the Authority Engineer all route control charts conforming to the ESP/SIPs, within a period of 3 (three) months from the Appointed Date;
 - (ii) The Authority Engineer shall review the route control chart within two weeks and submit it with its comments to the Authority for its approval; and



- (iii) The Authority shall communicate the route control chart as approved by it within a period not exceeding 2(two) months from the date of submission of the route control chart by the Contractor. Such period of two months shall exclude any time that is taken by the Contractor in providing clarifications or modifications in response to any communication from the Authority.

10.2.5 In the event of delay by the Contractor in submitting the signalling interlocking plan or route control chart, as the case may be, within the period specified in Clause 10.2.4 for any reason other than Force Majeure or breach of this agreement by the Authority, the Contractor shall pay Damages to the Authority in a sum equal to 0.01% (zero point zero one percent) of the Contract Price for each day of delay.

10.2.6 In the event of delay by the Authority in providing to the Contractor the approved signalling interlocking plan or route control chart as the case may be, within the period specified in Clause 10.2.4 for any reason other than Force Majeure or breach of this Agreement by the Contractor, the Authority shall pay Damages to the Contractor in a sum equal to 0.01% (zero point zero one percent) of the Contract Price for each day of delay, and shall also grant Time Extension in accordance with the provisions of Clause 10.4.

10.2.7 In regard to Contractor’s obligations with respect to the design and Drawings of the Railway Project as set forth in Schedule-H, 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, 3 (three) copies each of the design and necessary Drawings, duly approved/signed by the Design Director and certified/signed by the Proof Consultant, to the Authority Engineer for review. Provided, however, that in respect of Important Bridges, Major Bridges, Structures, railway stations and yards, the Authority Engineer may require additional drawings for its review in accordance with Good Industry Practice;
- (b) by submitting the Drawings for review to the Authority Engineer, the Contractor shall be deemed to have represented that it has determined and verified that the design and Drawings are in conformity with stipulated Specifications and Standards, the Applicable Laws, statutory stipulations and Good Industry Practice;
- (c) within 21 (twenty one) days of the receipt of the Drawings, the Authority Engineer shall review the same and convey its observations to the Contractor with particular reference to their conformity or otherwise with the Scope of the Project and the Specifications and Standards. Beyond the said period of 21 (twenty one) days, the Contractor shall not be obliged to await the observations of the Authority Engineer on the Drawings submitted pursuant hereto and may begin or continue Works at its own discretion and risk; Provided, however, that in case of Important Bridges, Major Bridges, Structures, interlocking and telecom switching equipment and any other specified item the aforesaid period of 21 (twenty one) days may be extended as per the time limit as indicated in Annexure-II of Schedule-D;



- (d) if the aforesaid observations of the Authority 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 Engineer for review. The Authority 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 Engineer for review as aforesaid, the Authority Engineer may cause the payment for the affected works to be withheld under and in accordance with the provisions of Clause 17.5.4. If the Contractor disputes any decision, direction or determination of the Authority Engineer hereunder, the Dispute shall be resolved in accordance with the Dispute Resolution Procedure;
 - (e) no review and/or observation of the Authority Engineer and/or its failure to review 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 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 shall, along with the affected Works, be corrected at the Contractor's cost, notwithstanding any review under this Article 10;
 - (f) the Contractor shall be responsible for delays in submitting the Drawings, as set forth in Schedule-H, caused by reason of delays in surveys and field investigations, and shall not be entitled to seek any relief in respect thereof 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 as set out in this Clause.
- 10.2.8 Any cost or delay in construction arising from the review by the Authority Engineer shall be borne by the Contractor.
- 10.2.9 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 observations of the Authority Engineer thereon as communicated pursuant to the provisions of Clause 10.2.7. Such Drawings shall not be amended or altered without prior written notice to the Authority 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.
- 10.2.10 Within 90 (ninety) days of the Project Completion Date, the Contractor shall furnish to the Authority and the Authority Engineer a complete set of as-built Drawings, in 2 (two) hard copies and in its editable digital format or in such other medium or manner as may be acceptable to the Authority, including an as-built survey illustrating the layout of the Railway Project and setback lines, if any, of the buildings and structures forming part of Project Facilities, and shall hand them over to the Authority against receipt thereof.



10.2.11 The Contractor shall also appoint a safety consultant (the “**Safety Consultant**”), at its own cost, contractor shall submit the panel within 30 days of Appointed date to the Authority Engineer, after proposing to the Authority a panel of 3 (three) names of qualified and experienced consultants having minimum 10 years experience in ensuring safety at work site from whom the Authority may choose 1 (one) 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 3 (three) names for obtaining the consent of the Authority. The Contractor shall also obtain the consent of the Authority for additional two key personnel of the Safety Consultant who shall have at least 5 years experience in ensuring safety at work site. 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. The Safety Consultant shall:

- (a) evolve a system approach for undertaking a safety audit of the Railway Project during construction phase ; and
- (b) proof check the detailed safety plan covering all aspects of including safety of Users, workers and equipment.

10.3 Construction of the Railway Project

10.3.1 The Contractor shall construct the Railway Project 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. For works involving existing yards, the non-interlocking programme for each yard shall be drawn by the Authority Engineer and provided to the Contractor. The Contractor and the Authority Engineer, within a period of 30 days, will discuss the same and issue a jointly agreed NI programme. The execution of work during the non-interlocking period will be the responsibility of the Contractor. The work during non-interlocking period in yards will be executed directly under the supervision of Railways, however, the timely completion of NI working will be the responsibility of the Contractor. The [730th (seven hundred thirty) 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, in which case the Scheduled Completion Date will be the extended date as per the time extension granted.

10.3.2 The Contractor shall construct the Railway Project in accordance with the Project Completion Schedule set forth in Schedule-I. 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-I, unless such failure has occurred due to Force Majeure or for reasons attributable to the Authority, it shall pay Damages to the Authority in a sum calculated at the rate of 0.05% (zero point zero five per cent) of the Contract Price for delay of each day reckoned from the date specified in Schedule - I and until such Project Milestone is achieved or the Works are 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-I shall be deemed to be modified accordingly and the provisions of this Agreement shall apply as if Schedule-I has been amended as above; provided further that in the event the Works are completed within or before the Scheduled Completion Date including any Time Extension, the Damages paid under this Clause 10.3.2 shall be refunded by the Authority to the Contractor, but without any interest thereon. For the avoidance of doubt, it is agreed that recovery of Damages under this Clause 10.3.2 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 10.4.2.

However, Authority may consider the request of contractor to defer the recovery of these damages if the same is considered essential to maintain the progress of work. The contractor shall submit a resource loaded plan to make good the delay and achieve next Milestone.

- 10.3.3 The Authority shall notify the Contractor of its decision to impose Damages in pursuance of the provisions of this Clause 10.3. Provided, however, that no deduction on account of Damages shall be effected by the Authority without 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 10.3.2 shall not exceed 10% (ten percent) of the Contract Price.
- 10.3.4 Certain works, which are executed in the vicinity of running track, may require prior sanction of Commissioner of Railway Safety (CRS) before execution of such works are taken up by the Contractor. Authority Engineer will advise such works to the Contractor. The Contractor shall be responsible to prepare and submit applications to Authority Engineer for obtaining sanction of CRS at least 60 (sixty) days in advance of commencing a work that requires prior sanction of CRS.

10.4 Extension of time for completion

- 10.4.1 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, [approval of GAD by road / canal authorities,] environmental/ forest clearances, or [signalling interlocking plan] and route control chart in accordance with the provisions of this Agreement;
 - (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 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.



10.4.2 The Contractor shall, no later than 30 (thirty) business days from the occurrence of an event or circumstance specified in Clause 10.4.1, inform the Authority 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 thereby.

10.4.3 In the event of the failure of the Contractor to issue to the Authority Engineer a notice in accordance with the provisions of Clause 10.4.2 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 10.4.3, the Authority shall be discharged from all liability in connection with the claim.

10.4.4 The Authority Engineer shall, on receipt of a claim in accordance with the provisions of Clause 10.4.2, examine the claim expeditiously within the time frame specified herein. In the event the Authority Engineer requires any clarifications to examine the claim, the Authority Engineer shall seek the same within 15 (fifteen) days from the date of receiving the claim. The Contractor shall, on the receipt of the communication of the Authority Engineer requesting for clarification, furnish the same to the Authority Engineer within 10 (ten) days thereof. The Authority 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. For the avoidance of doubt, the Parties agree that the Authority Engineer shall, in accordance with the provisions of this Agreement, notify the Contractor of the aforesaid Time Extension no later than 30 (thirty) days from the date of receipt of the Contractor's claim for Time Extension or the date of receipt of the clarification from the Contractor, as the case may be.

Provided that when determining each extension of time under this Clause 10.4, the Authority Engineer shall review previous determinations and may increase, but shall not decrease, the total Time Extension.

10.4.5 If the event or circumstance giving rise to the notice has a continuing effect:

- (a) the 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 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 Engineer shall examine and determine the same in accordance with the provisions of Clause 10.4.4 within a period of 30 (thirty) days of the receipt thereof.

10.5 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 endeavour to complete the balance work expeditiously and shall pay Damages to the Authority in accordance with the provisions of Clause 10.3.2 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 21.1.

10.6 Equipment specific Maintenance Manual

No later than 90 (ninety) days prior to the Project Completion Date, the Contractor shall, in consultation with the Authority Engineer, evolve an equipment specific maintenance manual for equipment based on a new technology not currently in use in the Railways (the “**Maintenance Manual**”) for the regular operation and maintenance of such equipment in conformity with safety requirements, Good Industry Practice and manufacturer’s manuals and instructions and shall provide 10 (ten) hard copies and 2 (two) compact discs thereof to the Authority Engineer.



ARTICLE 11

QUALITY ASSURANCE, MONITORING AND SUPERVISION

11.1 Quality of Materials and workmanship

- 11.1.1 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.
- 11.1.2 The Contractor warrants that all Materials shall be new, unused, not reconditioned and in conformity with Specification and Standards, Applicable Laws and Good Industry Practice, and that the Contractor shall not use any materials which are generally recognised as being deleterious under Good Industry Practice.

11.2 Quality control system

- 11.2.1 The Contractor shall establish a Quality Control Mechanism, Quality Assurance Plan (the “**Quality Assurance Plan**” or “**QAP**”), Material Testing Plan (the “**Material Testing Plan**” or “**MTP**”) and Method Statements for execution of works (the “**Method Statements**” or “**MS**”) in consultation of Authority Engineer.
- 11.2.2 The Contractor shall, within 30 (thirty) days of the Appointed Date, submit to the Authority Engineer its Quality Control Mechanism, QAP, MTP and MS which shall include the following:
- (a) organisation, duties and responsibilities, procedures, inspections and documentation;
 - (b) quality control mechanism including sampling and testing of Materials, tests required during the execution of works and frequencies by Contractor and Authority Engineer, 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 and Standards and Good Industry Practice; and
 - (c) internal quality audit system. The Contractor shall carry out internal audits of the Quality management System regularly, and at least once every 6 months. The Contractor shall submit to the Engineer a report listing the results of each internal audit within 7 days of completion. Each report shall include, where appropriate, the proposed measures to improve and/or rectify the Quality Management System and/or its implementation.

The Authority Engineer shall convey its comments 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.

- 11.2.3 The Contractor shall procure all documents, apparatus and instruments, fuel, consumables, water, electricity, labour, Materials, samples, and qualified personnel



as are necessary for examining and testing the Project Assets, Materials and workmanship in accordance with the Quality Assurance Plan.

- 11.2.4 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 any construction activity, submit to the Authority Engineer for review the Method Statement proposed to be adopted for executing the Work, giving details of inspection checklist, quality parameters, equipment to be deployed, traffic management and measures for ensuring safety. The Authority Engineer shall complete the review and convey its comments, if any, to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed method statement from the Contractor. The Contractor shall revise the method statements by incorporating these comments or else will advise the Authority Engineer reasons for not/partially including the same.

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 Works and issue appropriate directions to the Authority 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

At any time during construction, the Authority may appoint an external technical auditor to conduct an audit of the quality of the Works. The findings of the audit, to the extent accepted by the Authority, shall be notified to the Contractor and the Authority Engineer for taking remedial action in accordance with this Agreement. 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 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 Engineer a monthly report on the progress of Works and shall promptly give such other relevant information as may be required by the Authority Engineer along with all resources deployed and all problems faced during work.



11.8 Inspection

11.8.1 The Authority Engineer and its authorised representative shall at all 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.

11.8.2 The Contractor shall give the Authority Engineer and its authorised agents access, facilities and safety equipment for carrying out their obligations under this Agreement.

11.8.3 The Authority 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 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 Engineer for review:

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

11.10 Tests

11.10.1 For determining that the Works conform to the Specifications and Standards, the Authority 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 Contractor shall submit the schedule for performing such tests to the Authority Engineer well in advance and not less than 7 days prior to conducting such tests. The Contractor shall, with due diligence, carry out all the tests in accordance with the Agreement and furnish the results thereof to the Authority Engineer. Of the total tests for each category or type to be undertaken by the Contractor under the provisions of this Agreement and Good Industry Practice, the Authority Engineer or his authorised representative may witness or participate in such tests conducted or cause to be conducted by the Contractor. Documentation of test records to be maintained by Contractor and Authority Engineer or his authorised representative shall scrutinize 100% Testing records of all tests conducted as per existing guidelines of Indian Railways and Indian Road Congress. A copy of such tests records shall be provided to the Authority Engineer.



11.10.2 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 Engineer in this behalf. The Authority 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 the 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 Engineer is entitled to examine, inspect, measure 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 Engineer whenever any such work is ready and before it is covered up. The Authority Engineer shall then either carry out the examination, inspection or testing without unreasonable delay, or promptly give notice to the Contractor that the Authority 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 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 Engineer within a period of 3 (three) business days from the date on which the Contractor's notice hereunder is delivered to the Authority Engineer, the Contractor shall be entitled to assume that the Authority Engineer would not undertake the said inspection.

11.12 Rejection

11.12.1 If, as a result of an examination, inspection, measurement or testing, any Plant, Material, design or workmanship is found to be defective or otherwise not in accordance with the provisions of this Agreement, the Authority Engineer may reject such Plant, Material, 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.

11.12.2 If the Authority Engineer requires the Plant, Material, design or workmanship to be retested, the tests shall be repeated on the same terms and conditions, as applicable in each case. If the rejection and retesting cause the Authority to incur any additional costs, such costs 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.

11.12.3 The Contractor shall not be entitled to any extension of time on account of rectifying any Defect or retesting as specified in this Clause 11.12.

11.12.4 No examination, inspection, measurement or testing of any Plant, Material, design or workmanship by the Authority Engineer or its failure to convey its observations or to examine, inspect, measure or test shall relieve the Contractor of its obligations and liabilities under this Agreement in any manner nor shall the Authority be liable for the same in any manner.



11.13 Remedial work

11.13.1 Notwithstanding any previous test or certification, the Authority 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 Railway Project, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work which is required on account of a Force Majeure Event, the provisions of Clause 19.6 shall apply.

11.13.2 If the Contractor fails to comply with the instructions issued by the Authority Engineer under Clause 11.13.1, within the time specified in the Authority Engineer's notice or as mutually agreed, the Authority 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 10.3.2, in the event the Contractor does not achieve any of the Project Milestones within the time period stipulated in Schedule - I or the Authority Engineer shall have reasonably determined that the rate of progress of Works is such that Completion of the Railway Project is not likely to be achieved by the end of the Scheduled Completion Date, it may notify the same to the Contractor, and the Contractor shall, within 15 (fifteen) days of such notice, by a communication inform the Authority 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 to the Authority Engineer a copy of all its quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2.

11.16 Video recording

During the Construction Period, the Contractor shall provide to the Authority for every calendar quarter, a video recording, which will be compiled into a 3 (three) hour digital video disc or any substitute thereof, 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

- 11.17.1 Upon recommendation of the Authority Engineer to this effect, or on its own volition in cases of emergency or urgency, 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 Engineer or the Authority, as the case may be, such work threatens the safety of the Users and or other persons on or about the Railway Project.
- 11.17.2 The Contractor shall, pursuant to the notice under Clause 11.17.1, 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, other persons and vehicles on or about the Railway Project including pedestrians. The Contractor may by notice require the Authority 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 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.
- 11.17.3 Subject to the provisions of Clause 19.6, 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.
- 11.17.4 If suspension of Works is for reasons not attributable to the Contractor, the Authority Engineer shall determine any Time Extension to which the Contractor is reasonably entitled.



ARTICLE 12

COMPLETION CERTIFICATE

12.1 Tests on completion

12.1.1 No later than 30 (thirty) days prior to the likely completion of the Railway Project or a part thereof, the Contractor shall prepare and submit to the Authority Engineer the documents required for seeking approval of the Commissioner of Railway Safety in accordance with the provisions of the Railways Opening for Public Carriage of Passenger Rules, the Indian Railway Permanent Way Manual, the Indian Railways Manual of A.C. Traction, Indian Railways Signal Engineering Manual, Indian Railways Telecom Manual as the case may be, and notify the Authority Engineer of its intent to subject the Railway Project to Tests. After ensuring and procuring that the documents required to be submitted to the Commissioner for Railway Safety meet the requirements of Applicable Laws, the Authority Engineer shall, in consultation with the Contractor, determine the date and time of each of the Tests, and inform the Authority who may designate its representative to witness the Tests. The Contractor shall provide such assistance as the Authority Engineer may reasonably require for conducting the Tests. For avoidance of doubts, the parties agree that in the event of the Contractor and the Authority 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 Engineer. Authority will carry out tests on completion within 30 days of receiving request from contractor. And if Authority Engineer fails to carry out test within 30 days, the Authority will pay damage to Contractor @ 0.02% of the payment pending for want of test per day.

12.1.2 All Tests shall be conducted in accordance with Schedule-J at the cost and expense of the Contractor; provided, however, that the trial running on railway track shall be undertaken at the cost and expense of the Authority. The Authority Engineer shall observe, monitor and review the results of the Tests to determine compliance of the Railway Project with Specifications and Standards and if it is reasonably anticipated or determined by the Authority Engineer during the course of any Test that the performance of the Railway Project 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 any Defect or deficiency. Upon completion of each Test, the Authority Engineer shall provide to the Contractor and the Authority copies of all Test data including detailed Test results. For the avoidance of doubt, the Parties expressly agree that the Authority 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 Railway Project thereof with the Specifications and Standards.

12.2 Provisional Certificate

12.2.1 Upon completion of Tests, the Authority Engineer shall satisfy itself that the Tests have been successful and the Railway Project is fit for opening to traffic. A list of outstanding items signed jointly by the Authority Engineer and the Contractor (called the “**Punch List**”) shall be prepared in two parts. The part-1 showing the critical/safety items and the part-2 showing non-critical/non-safety items. The Authority Engineer may issue a Provisional Certificate to the Contractor and the Authority in the form set forth in Schedule-K (the “**Provisional Certificate**”),



provided the items figuring in the Punch List of critical/safety items (part-1) have been fully completed/attended to. The items figuring in the Punch List(part-2) of non-critical/non-safety should be completed by contractor in a time frame as stipulated in Clause 12.3.

- 12.2.2 Upon issuance of the “Provisional Certificate”, the Authority Engineer shall forward to the Authority (i) copies of all Test data including Test results, and (ii) the documents submitted by the Contractor for seeking approval of the Commissioner of Railway Safety in accordance with the provisions of the Railways Opening for Public Carriage of Passenger Rules, the Indian Railway Permanent Way Manual/ or the Indian Railways Manual of A.C. Traction, Indian Railways Signal Engineering Manual, Indian Railways Telecom Manual as the case may be, for obtaining authorisation from the Commissioner for Railway Safety.
- 12.2.3 The Contractor shall assist the Authority during inspection and tests to be conducted by the Commissioner of Railway Safety for determining compliance of the Railway Project with Applicable Laws and the provisions of this Agreement.
- 12.2.4 The Defects Liability Period for the Railway Project shall commence from the date of issue of the Provisional Certificates.
- 12.2.5 The Parties hereto expressly agree that the Authority Engineer may also issue a “part Provisional Certificate” for part of the Railway Project ready for commissioning/opening subject to the provisions of Clauses 12.1 and 12.2 applying mutatis mutandis. The issuance of the part-provisional certificate will however not absolve the contractor in any manner of its obligations to complete the remaining part of Railway Project.
- 12.2.6 The risk of loss or damage to any Materials, Plant or Works in the Railway Project or part thereof, as the case may be, and the care and custody thereof shall pass from the Contractor to the Authority upon issuance of Provisional Certificate for the Railway Project or part thereof.

12.3 Completion of Part-2 Punch List items

All items figuring in the Punch List shall be completed by the Contractor within 90 (ninety) days of the date of issuance of the Provisional Certificate and for any delay thereafter, other than for reasons solely attributable to the Authority or due to Force Majeure, the Authority shall be entitled to recover Damages from the Contractor to be calculated and paid for each day of delay until all items are completed, at the lower of (a) 0.005% (zero point zero zero five per cent) of the contract price and (b) 0.2% (zero point two percent) of the cost of completing such items as estimated by the Authority Engineer. Subject to payment of such Damages, the Contractor shall be entitled to a further period not exceeding 120 (one hundred and twenty) days for completion of the Punch List items. For the avoidance of doubt, it is agreed that if completion of any item in the Punch List is delayed for reasons attributable to the Authority or due to Force Majeure, the completion date thereof shall be determined by the Authority Engineer in accordance with Good Industry Practice, and such completion date shall be deemed to be the date of issue of the Provisional Certificate for the purposes of Damages, if any, payable for such item under this Clause 12.3.



12.4 Completion Certificate

- 12.4.1 Upon completion of all items in the Punch List (part-1 as well as part-2) and issuance of authorisation by the Commissioner of Railway Safety and compliance of all CRS observations pertaining to Contractor if any, the Authority Engineer shall issue forthwith to the Contractor and the Authority; a completion certificate substantially in the form set forth in Schedule-K (the “**Completion Certificate**”) separately in respect of each Provisional Certificate issued. For Avoidance of doubt, Completion Certificate may also be issued for part-commissioning of Project.
- 12.4.2 Upon receiving the Completion Certificate, the Contractor shall remove its equipment, materials, debris and temporary works from the Site, which are not required any more for the Project, within a period of 15 (fifteen) 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.

12.5 Rescheduling of Tests

If the Authority Engineer certifies to the Authority and the Contractor that it is unable to issue the Completion Certificate or Provisional 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.

12.6 Delayed authorisation

In the event of delay in issuance of authorisation by the Commissioner of Railway Safety beyond a period of 60 (sixty) days from the date of completion of all safety/critical items of punch list, the Contractor shall be entitled to interest for the period of delay at a rate equal to 3% (three percent) above the Bank Rate on the payment due for integrated testing and commissioning as specified in Schedule-G.



ARTICLE 13

CHANGE OF SCOPE

13.1 Change of Scope

13.1.1 The Authority may, notwithstanding anything to the contrary contained in this Agreement, require the Contractor to make modifications or alterations to the Works (“**Change of Scope**”) before the issue of the Completion Certificate either by giving an instruction or by requesting the Contractor to submit a proposal for 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.

13.1.2 Change of Scope shall mean:

- (a) change in specifications of any item of Works;
- (b) omission of any work from the Scope of the Project except under Clause 8.3.3; 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 entity; 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. However any unsanctioned work which is independent work per se shall not be considered as Change of scope;
- (d) Variation in the quantities of certain items (positive or negative) necessitated due to any change(s) in the L-Section/Alignment/ESPs of the Project with respect to those attached with this document, except on account of existing ground conditions/ground levels mentioned in L-Section/Alignment/ESPs. For avoidance of doubt, it is clarified that the existing ground conditions/ground levels are to be validated by bidders before bid and hence no change on this account is payable, except for works under schedule G1.
- (e) any change in quantities under Schedule G1;

13.1.2.1 Unless parties agree to the contrary, following shall be the limits of variation for items of works under Schedule G1;

(a) For Items related to work of foundation	No Limits
(b) For Items in Schedule G1 related to works other than foundation	25%

13.1.3(1) If the Contractor determines at any time that a Change of Scope will, if adopted, (i) accelerate completion, (ii) reduce the cost to the Authority of executing, maintaining or operating the Railway Project, (iii) improve the efficiency or value to the Authority of the completed Railway Project, or (iv) otherwise be of benefit to the Authority, it shall prepare a proposal with relevant details, as under :-



- (a) for works under schedule G, and for items covered under schedule G1 beyond the limits of variation mentioned in article 13.1.2.1, at its own cost; or
- (b) for works under schedule G1 within the limits of variation mentioned in article 13.1.2.1, as per cost derived on the basis of accepted rates of respective items under schedule G1.

The Contractor shall submit such proposal, supported with the relevant details including the amount of reduction in the Contract Price, if any, to the Authority to consider such Change of Scope. The Authority shall, within 15 (fifteen) days of receipt of such proposal, either accept such Change of Scope with modifications, if any, and initiate proceedings there for in accordance with this Article 13 or reject the proposal and inform the Contractor of its decision.

- (2) In case Change of Scope is proposed by Authority Engineer to the contractor is for items covered under schedule G1 within the limits of variation mentioned in article 13.1.2.1, the contractor shall accept and continue the works as per rate accepted for those items/ schedules under schedule G1.]

In case Change of Scope is proposed by Authority Engineer to the contractor [is for the items not covered either in the scope of work under schedule G, or within the limits of variation mentioned in article 13.1.2.1 for the items under schedule G1,] the contractor shall, within 15 (fifteen) days of receipt of such proposal, either accept such Change of Scope with modifications, if any, and initiate proceedings therefore in accordance with this Article 13 or reject the proposal and inform the authority of its decision.

For the avoidance of doubt, the Parties agree that the Contractor shall not undertake any Change of Scope without a Change of Scope Order being issued by the Authority, save and except any Works necessary for meeting any Emergency.]

13.2 Procedure for Change of Scope

- 13.2.1 In the event of the Authority determining that a Change of Scope is necessary, it may direct the Authority Engineer to issue to the Contractor a notice specifying in reasonable detail the works and services contemplated thereunder (the “**Change of Scope Notice**”).
- 13.2.2 Upon receipt of a Change of Scope Notice from Authority Engineer, the Contractor shall, with due diligence, provide to the Authority Engineer such information as is necessary, together with preliminary documentation in support of:
 - (a) the impact of the Change of Scope 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) breakup of the quantities, unit rates and cost for different items of work;
 - (ii) proposed design for the Change of Scope [, if required]; and



- (iii) proposed modifications, if any, to the Project Completion Schedule of the Railway Project.

For the avoidance of doubt, the Parties expressly agree that, subject to the provisions of Clause 13.4.2, the Contract Price shall be increased or decreased, as the case may be, on account of Change of Scope.

13.2.3 The Contractor’s quotation of rates/costs for the Change of Scope shall be determined on the following principles:

- (A) The rate for various items to be executed through change of scope order shall be estimated on the basis of analysis of rates (AOR) of [Zonal Railway, CORE, whichever is applicable] for item other than building works and as per CPWD’s AOR for building works and by applying the prevailing market rates of various input construction materials, labour, machinery and T&P.

For working out rate of item in change of scope, the following shall be considered –

- (a) Input of man days, quantities of materials etc.
- (b) The market rates of various materials, labour, machinery shall be as follows:
- i. For materials market rate shall be based on invoices submitted by contractor or Purchase order placed by contractors for the supply of materials
 - ii. Rates for unskilled, semi-skilled and skilled workers as per the records maintained by the Contractor in accordance with the Laws subject to maximum of those payable as per minimum wages act.
- (c) Contractor’s overheads and profit at the rate of 15 (Fifteen) percent of the cost arrived by above AOR.
- (d) Applicable Taxes.

- (B) In case AOR of any items is not available in [Zonal Railway’s or CORE’s AOR] then such rates shall be determined as per prevailing market rates in accordance with Good Industry Practice by the Authority Engineer.

13.2.4 Upon reaching an agreement, the Authority shall issue an order (the “**Change of Scope Order**”) requiring the Contractor to proceed with the performance thereof. 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 thereof at the rates and conditions approved by the Authority till the matter is resolved in accordance with Article 24; or
- (b) proceed in accordance with Clause 13.5.

13.2.5 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

- 13.4.1 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.
- 13.4.2 Unless the Parties mutually agree to the contrary, the total value of all Change of Scope Orders shall not exceed 25% (twenty five per cent) of the Contract Price.
- 13.4.3 Notwithstanding anything to the contrary in this Article 13, no change arising from any default of the Contractor in the performance of its obligations under this Agreement shall 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

- 13.5.1 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 on the basis of open competitive bidding from amongst bidders who are pre-qualified for undertaking the additional work; provided that the Contractor shall have the option of matching the first ranked bid in terms of the selection criteria, subject to payment of 2% (two per cent) of the bid amount to the Authority^s, and thereupon securing the award of such works or services. For the avoidance of doubt, it is agreed that the Contractor shall be entitled to exercise such option only if it has participated in the bidding process and its bid does not exceed the first ranked bid by more than 10% (ten percent) thereof. It is also agreed that the Contractor shall provide assistance and cooperation to the person who undertakes the works or services hereunder, but shall not be responsible for rectification of any Defects and/or maintenance of works carried out by other agencies.
- 13.5.2 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 it should not cause any disruption to the Project and also minimise adverse effect to main contractor. The provisions of this Agreement, insofar as they relate to Works and Tests, shall apply mutatis mutandis to the works carried out under this Clause 13.5.

^s The Authority shall transfer 75% (seventy five percent) of the amount so received to the first ranked bidder whose bid shall have been matched by the Contractor.



ARTICLE 14

TRAFFIC REGULATION

14.1 Traffic regulation by the Contractor

- 14.1.1 The Contractor shall take all the required measures and make arrangements for the safety of any persons and vehicles on or about the Site during the construction of the Railway Project or a Section thereof in accordance with Good Industry Practice, and Applicable Laws. 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 using any public roads or access along or across the Section under construction.
- 14.1.2 All works shall be carried out in a manner creating least interference to traffic passing along or across the Railway Project or a Section thereof. The Contractor shall ensure that proper passage is provided for the traffic. Where it is not possible or safe to allow traffic on the existing road or passage, a temporary diversion of proper specifications shall be constructed by the Contractor at its own cost. The Contractor shall take prior approval of the Authority Engineer for any proposed arrangement for traffic regulation during Construction, which approval shall not be unreasonably withheld.
- 14.1.3 In the event any construction work is required to be executed in close proximity of an existing operating system of Railways, the Contractor shall make arrangements for the safety of such system in accordance with the provisions of the ‘Compendium of Instructions on Safety at work Sites’ issued by the Authority and Good Industry Practice.



ARTICLE 15

DEFECTS LIABILITY

15.1 Defects Liability Period

- 15.1.1 The Contractor shall be responsible for all the Defects and deficiencies, except usual wear and tear in the Railway Project or any part thereof, till the expiry of a period of **2 (two) years** commencing from the date of Provisional Certificate or expiry of a period 18 (eighteen) months from the date of Completion Certificate, whichever is later (the “**Defects Liability Period**”).
- 15.1.2 Without prejudice to the provisions of Clause 15.1.1, the Defects Liability Period for and in respect of any Structure or Important/Major Bridge/ROB/RUB/LHS specified in Schedule B, or interlocking and telecom switching equipment comprising a new technology shall be deemed to be extended by a further period of **2 (two) year** after the expiry of the Defects Liability Period specified in Clause 15.1.1. Defect Liability Period shall also cover the extensions covered under clause 15.6.
- 15.1.3 Deleted.
- 15.1.4 Without prejudice to the provisions of Clause 15.1.1, the Contractor shall be responsible for making arrangement for signing of agreement for AMC of EI system /Axle Counters/ Automatic Train protection system between OEM/Approved vendor and concerned Railway/Division 6 months prior to defects liability period as defined in 15.1.1. for duration of Defect liability period including extended defect liability period. In the event that the Contractor fails to make above Arrangement, the Authority shall be entitled to remedy the defects and deficiency of the Contractor in Accordance with the clause 15.4 or may extend the Defects Liability Period in accordance with clause 15.6.1.

15.2 Remedy and rectification of Defects and deficiencies

- 15.2.1 Without prejudice to the provisions of Clause 15.2.2, the Contractor shall repair or rectify all Defects and deficiencies observed by the Authority Engineer during the Defects Liability Period within a period of 15 (fifteen) days from the date of notice issued by the Authority Engineer, or within such reasonable period as may be determined by the Authority Engineer at the request of the Contractor, in accordance with Good Industry Practice. For the purpose of this clause, the time period of 15 days shall be applicable only to those Defects and Deficiencies which are not affecting train operations of safety. For any defect noticed affecting train operation of train safety, the Contractor shall arrange to rectify it within such reasonable period as may be determined by the Authority Engineer. If the Contractors not able to rectify any fault as decided by the Authority Engineer, the Authority will be at full liberty to make its own efforts to get such defects rectified at Contractor’s cost.
- 15.2.2 During a period of 2 (two) months from the date of issuance of Completion Certificate, the Contractor shall retain sufficient staff and spares at Project for procuring prompt replacement, installation or re-installation of any defective parts of (a) the SCADA system; (b) traction sub-stations and switching posts and (c) EI system /Axle Counters/ Automatic Train protection system. The spares for the



purpose of this clause, shall be separate from any spares supplied within the scope of the Project.

15.3 Cost of remedying Defects

For the avoidance of doubt, any repair or rectification undertaken in accordance with the provisions of Clause 15.2, including any additional tests, 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) Works, Plant, Materials or workmanship not being in accordance with this Agreement and the Specifications and Standards;
- (c) improper maintenance during construction of the Railway Project by the Contractor; or
- (d) failure by the Contractor to comply with any other obligation under this Agreement.

15.4 Contractor's failure to rectify Defects

In the event that the Contractor fails to repair or rectify such Defect or deficiency within the period specified in Clause 15.2, the Authority shall be entitled to get the same repaired, rectified or remedied at the Contractor's cost so as to make the Railway Project 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 Engineer. The cost so determined, and an amount equal to 20% (twenty percent) of such 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.

15.5 Contractor to search cause

- 15.5.1 The Authority Engineer may instruct the Contractor to examine the cause of any Defect in the Works or part thereof before the expiry of the Defects Liability Period.
- 15.5.2 In the event any Defect identified under Clause 15.5.1 is attributable to the Contractor, the Contractor shall rectify such Defect within the period specified by the Authority Engineer, and shall bear the cost of the examination and rectification of such Defect.
- 15.5.3 In the event such Defect is not attributable to the Contractor, the Authority Engineer shall, after due consultation with the Authority and the Contractor, determine the costs incurred by the Contractor on such examination and notify the same to the Contractor, with a copy to the Authority, and the Contractor shall be entitled to payment of such costs by the Authority.

15.6. Extension of Defects Liability Period

- 15.6.1 The Defects Liability Period shall be deemed to be extended till the identified Defects under Clause 15.2 have been remedied.



- 15.6.2 Any Materials or Works with Defects identified under Clause 15.2 and replaced or repaired during the Defects Liability Period or the extended Defects Liability Period, as the case may be, would be further warranted for a period of twelve (12) months from the date of completion of such repair or replacement.
- 15.6.3 The Contractor shall upon termination or expiry of this Agreement or upon expiry of the Defects Liability Period, assign any outstanding benefit in respect of any subcontract or any warranty, to the Authority or to such other person as the Authority may direct.



ARTICLE 16

AUTHORITY ENGINEER

16.1 Appointment of the Authority Engineer

- 16.1.1 The Authority shall appoint a railway engineer /Project Management Services (PMS) Agency, to be the engineer under this Agreement (the “**Authority Engineer**”).
- 16.1.2 The appointment of the Authority Engineer shall be made no later than 30 (Thirty) days from the date of this Agreement. The Authority shall notify the appointment or replacement of the Authority Engineer to the Contractor.
- 16.1.3 The staff of the Authority Engineer shall include suitably qualified engineers and other professionals who are competent to assist the Authority Engineer to carry out its duties.

16.2 Duties and functions of the Authority Engineer

- 16.2.1 The Authority Engineer shall perform its duties and discharge its functions in accordance with the provisions of this Agreement, and substantially in accordance with the duties and responsibilities set forth in Annex 1 of Schedule L, 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) providing Power Block or Traffic Block or necessary disconnections to the Contractor;
 - (e) approval of signalling & interlocking plan and route control chart; and alterations in ESP if essentially required;
 - (f) approval of disconnections for modification of signalling and telecom works, or
 - (g) any other matter which is not specified in (a) to (f) above and which creates an obligation or liability on either Party for a sum exceeding Rs.5,000,000 (Rupees fifty lakh).
- 16.2.2 No decision or communication of the Authority 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 16.2.1.
- 16.2.3 The Authority Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions assigned to him for the project. Such reports shall be submitted by the Authority Engineer within 10 (ten) days of the beginning of every month.



16.2.4 A true copy of all communications sent by the Authority to the Authority Engineer and by the Authority Engineer to the Authority shall be sent forthwith by the Authority Engineer to the Contractor.

16.2.5 A true copy of all communications sent by the Authority Engineer to the Contractor and by the Contractor to the Authority Engineer shall be sent forthwith by the Authority Engineer to the Authority.

16.3 Authorised signatories

The Authority Engineer will designate and notify to the Contractor up to 2 (two) persons under him to sign for and on behalf of the Authority Engineer, and any communication or document required to be signed by the Authority Engineer shall be valid and effective only if signed by any of the designated persons; provided that the Authority Engineer may, by notice in writing, substitute any of the designated persons by any of its employees.

16.4 Instructions of the Authority Engineer

16.4.1 The Authority Engineer may issue to the Contractor instructions for remedying any Defect. The Contractor shall take such instructions from the Authority Engineer only.

16.4.2 The instructions issued by the Authority Engineer shall be in writing. However, if the Authority Engineer issues any oral instructions to the Contractor, it shall confirm in writing the oral instructions within 2 (two) working days of issuing them.

16.4.3 In case the Contractor does not receive the confirmation of the oral instructions within the time specified in Clause 16.4.2, the Contractor shall seek the written confirmation of the oral instructions from the Authority Engineer and shall obtain acknowledgement from the Authority Engineer of the communication seeking written confirmation. In case of failure of the Authority Engineer 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 instruction.

16.5 Determination by the Authority Engineer

16.5.1 The Authority Engineer shall consult with each Party in an endeavour to reach agreement wherever this Agreement provides for the determination of any matter by the Authority Engineer. If such agreement is not achieved, the Authority Engineer shall make a fair determination in accordance with this Agreement having due regard to all relevant circumstances. The Authority Engineer shall give notice to both the Parties of each such agreement or determination, with supporting particulars.

16.5.2 Each Party shall give effect to each agreement or determination made by the Authority 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 Engineer, the Dispute shall be resolved in accordance with the Dispute Resolution Procedure as per article 24.



16.6 Remuneration of the Authority Engineer

The remuneration, cost and expenses of the Authority Engineer shall be borne by the Authority.

16.7 Replacement of the Authority Engineer

- 16.7.1 The Authority may, in its discretion, replace the Authority Engineer at any time, but only upon appointment of another Authority Engineer in accordance with Clause 16.1.
- 16.7.2 If the Contractor has reasons to believe that the Authority 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 replacement of the Authority Engineer. Upon receipt of such representation, the Authority shall hold a tripartite meeting with the Contractor and Authority Engineer and make best efforts for an amicable resolution of the Dispute. After due consideration, The Authority will decide about the replacement of Authority Engineer or otherwise. However , if Contractor is not satisfied with decision of Authority, the Dispute shall be resolved in accordance with Depute Resolution Procedure as per article 24. In the event that the Authority Engineer is to be replaced, the Authority shall appoint forthwith another Authority Engineer in accordance with Clause 16.1.

16.8 Interim Arrangement

In the event that the Authority has not appointed an Authority Engineer, or the Authority Engineer so appointed has relinquished its functions, the Authority may, in the interim, designate and authorise any person to discharge the functions of the Authority Engineer in accordance with the provisions of this Agreement, save and except that such person shall not exercise any functions relating to review, comment, approval or inspection as specified in this Agreement for and in respect of the Authority Engineer, and such functions shall be discharged as and when an Authority Engineer is appointed in accordance with the provisions of this Agreement. Provided, however, that nothing contained in this Clause 16.8 shall in any manner restrict the rights of the Authority to enforce compliance of the provisions of this Agreement.



Part IV

Financial Covenants



ARTICLE 17

PAYMENTS

17.1 Contract Price

- 17.1.1 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 Rs. ***** (Rs. *****) under schedule G and on the basis of actual work done for an amount of Rs. *****] (the “**Contract Price**” [= **Sum of schedule G and Schedule G1= Rs ***** Rs *******]), which shall be subject to adjustments in accordance with the provisions of this Agreement. 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.
- 17.1.2 The Contract Price includes all duties, taxes, royalty, and fees that may be levied in accordance with the laws and regulations in force as on the Base Month on the Contractor’s equipment, Plant, Materials and supplies acquired for the purpose of this Agreement and on the on the Works undertaken 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.
- 17.1.3 The Contract Price shall not be adjusted for any change in duties, taxes etc. specified in Clause 17.1.2 above, save and except as specified in Clauses 17.8 and 17.13.
- 17.1.4 The Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs, unless otherwise provided for in this Agreement.
- 17.1.5 Unless otherwise specified 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 thereof and for the rectification of any Defects in the Railway Project.
- 17.1.6 All payments under this Agreement shall be made in Indian Rupees.

17.2 Advance Payment

- 17.2.1 Upon receiving request from Contractor, the Authority shall make an advance payment (the “**Advance Payment**”), up to 10% (ten percent)¹⁴ of the Contract Price, for mobilisation expenses and for acquisition of equipment, which shall carry simple interest at the rate of Bank Rate plus 4% per annum and shall be made in two instalments of up to maximum 5% (five per cent) of the contract price each.
- 17.2.2 The Contractor may apply to the Authority for the first instalment 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

¹⁴For large value (Contract price not less than 500 cr.) or complex projects, the Advance Payment may be increased from 10% (ten per cent) to up to 15% (fifteen per cent) of the Contract Price.



and ten per cent) of such instalment, substantially in the form provided at Annex-III of Schedule-F, to remain effective till the complete and full repayment thereof.

- 17.2.3 At any time, after 60 (sixty) days from the Appointed Date, the Contractor may apply to the Authority for the second instalment 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 instalment, substantially in the form provided at Annex-III of Schedule-F, to remain effective till the complete and full repayment thereof along with proof of utilization of 1st instalment.
- 17.2.4 The instalments of Advance Payment shall generally 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 17.2.
- 17.2.5 The Advance Payment shall be recovered through proportionate deductions to be made in the Interim Payments Certificates issued in accordance with the provisions of Clause 17.5.2. Deductions of Advance Payment shall commence from the Interim Payment Certificate in which the cumulative interim payments certified shall have reached 50% (fifty per cent) of the Contract Price. The total amount recovered in each Interim Payment Certificate shall be equal to 30% (thirty per cent) of the amount of interim payment due and payable under such Interim Payment Certificate, and interest on the amount being recovered to be calculated from the date of disbursement of the Advance Payment to the date of recovery until the entire Advance Payment together with interest is recovered. For the avoidance of doubt, the Parties agree that in the event the total payment specified in any Interim Payment Certificate exceeds the limit of 50% (fifty per cent) of the Contract Price, the proportionate of recovery hereunder shall be restricted to the amount exceeding 50% (fifty per cent) of the Contract Price. By way of illustration, the Parties agree that if the first recovery of say, Rupees ‘x’ is made after 20 (twenty) months from the date of 1st (first) instalment of the Advance Payment, the interest will be recovered on Rupees ‘x’ for a period of 20 (twenty) months; and when the next recovery is made in the following month for say, Rupees ‘y’, interest on Rupees ‘y’ will be computed for a period of 21 (twenty one) months. The Parties further agree that no payments in excess of 90% (ninety per cent) of the Contract Price shall be released until the Advance Payment, including interest thereon, has been fully recovered.
- 17.2.6 If the Advance Payment has not been fully repaid prior to Termination under Clause 19.7 or Article 21, as the case may be, the whole of the balance then outstanding shall immediately become due and payable by the Contractor to the Authority. In the event of Termination due to Contractor’s Default, the Advance Payment shall be deemed to carry interest at annual rate of 4% (four per cent) above the Bank Rate from the date of Advance Payment to the date of recovery by encashment of bank guarantee for the Advance Payment. For the avoidance of doubt, the aforesaid interest shall be payable on each instalment of the Advance Payment, regardless of whether the instalment or any part thereof has been repaid to the Authority prior to Termination.
- 17.2.7 For large value (Contract price not less than 500 cr.) and complex projects, the Authority shall make Advance Payment up to 15% (fifteen per cent) of the Contract Price. The payment shall be made in two instalments of up to maximum 7.5% (seven and half per cent) of the contract price each on fulfilment of conditions stipulated in clause 17.2.2 and 17.2.3.



17.3 Procedure for estimating the payment for the Works

17.3.1 The Authority shall make interim payments to the Contractor, as certified by the Authority Engineer on completion of a Stage, for a length, number or area as specified, and valued in accordance with the proportion of the Price assigned to each item and its stage and payment procedure in Schedule-G *or/and as per actual execution of items as specified for works under schedule G1.*

17.3.2 The Contractor shall base its claim for interim payment for the stages completed for works under schedule G *or/and* as per execution of items for works under schedule G1 till the end of the month for which the payment is claimed, valued in accordance with Clause 17.3.1, supported with necessary particulars and documents in accordance with this Agreement.

17.3.3 Any reduction in the Contract Price arising out of Change of Scope or the Works withdrawn under Clause 8.3, as the case may be, 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 the avoidance of doubt and by way of illustration, the Parties agree that if the amount assigned to Important Bridges and/or Major Bridges is reduced from Rs.100 crore to Rs. 80 crore owing to Change of Scope or withdrawal of Works, as the case may be, the reduction in payment shall be restricted to the relevant payments for Important Bridges and/or Major Bridges and the payment due in respect of all other stage payments under the item Important Bridges and/or 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.

17.4 Stage Payment Statement for Works

The Contractor shall submit a statement (the “**Stage Payment Statement**”), in 3 copies, by the 7th (seventh) day of a month to the Authority Engineer in the form set forth in Schedule-M, showing the amount calculated in accordance with Clause 17.3 to which the Contractor considers itself entitled for the completed stage(s) of Works under schedule G *or/and* completed items of works under schedule G1. 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. In the event that there is no claim for a month in accordance with the provisions of this Clause 17.4, the Contractor shall submit a nil claim to the Authority Engineer.

17.5 Stage Payment for Works

17.5.1 Within 04 (four) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 17.4, the Authority Engineer shall broadly determine the amount due to the Contractor and recommend the release of 80 (eighty) percent of the amount so determined as part payment against the Stage Payment Statement, pending issue of the Interim Payment Certificate (IPC) by the Authority Engineer. Within 03 (three) days of the receipt of recommendation of the Authority Engineer as above, the Authority shall make electronic payment directly to the Contractor’s bank account.



- 17.5.2 Within 20 (twenty) days of the receipt of the Stage Payment Statement referred to in Clause 17.4, the Authority 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 there for.
- 17.5.3 In cases where there is a difference of opinion as to the value of any stage, the opinion of the Authority Engineer 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.
- 17.5.4 The Authority 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 in respect of which the Authority Engineer had notified the Contractor; and
 - (b) the estimated cost of rectification of any Works which have not been constructed in accordance with this Agreement.
- 17.5.5 Payment by the Authority shall not be deemed to indicate the Authority acceptance, approval, consent or satisfaction with the work done.
- 17.5.6 In the event the amounts released by the Authority under Clause 17.5.1 exceed the amount finally determined by the Authority Engineer pursuant to Clauses 17.5.2 to 17.5.4, the difference thereof shall be accounted for in the next IPC.

17.6 Payment of Damages

- 17.6.1 The Contractor as well as the Authority may claim Damages due and payable to it in accordance with the provisions of this Agreement.
- 17.6.2 The Authority Engineer shall verify and check the claim and issue the IPC within 20 (twenty) days of the receipt of the claim under Clause 17.6.1, after making adjustments in accordance with the provisions of this Agreement. The Authority shall pay to the Contractor the amount due under such IPC within a period of 30 (thirty) days from the date of the submission of the claim under this Clause 17.6. 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 17.7 shall apply *mutatis mutandis* thereto.

17.7 Time of payment and interest

- 17.7.1 The Authority shall pay to the Contractor any amount due under any payment certificate issued by the Authority Engineer in accordance with the provisions of this Article 17, 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 Engineer for certification in accordance with the provisions of Clause 17.4 for an IPC; provided, however, that in the event the IPC is not issued by the Authority 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 adjusted in the next payment certificate; 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 Engineer for certification in accordance with the provisions of Clause 17.12.

17.7.2 In the event of failure of the Authority to make payment to the Contractor within the time period specified in this Clause 17.7, the Authority shall be liable to pay to the Contractor interest at a rate equal to the Bank Rate plus 3%, calculated at quarterly rests, on all sums remaining unpaid from the date by which the same should have been paid, calculated in accordance with the provisions of Clause 17.7.1 (a) and (b) and till the date of actual payment.

17.8 Price adjustment for Works

17.8.1 The amounts payable to the Contractor for Works shall be adjusted in accordance with the provisions of this Clause 17.8.

17.8.2 Subject to the provisions of Clause 17.8.3, the amounts payable to the Contractor for Works shall be adjusted in the IPC issued by the Authority 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 specified in Clause 17.8.4.

17.8.3 To the extent that any compensation or reimbursement for 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.

17.8.4 The Contract Price for Works under schedule G shall be adjusted for increase or decrease in rates and prices of labour, Materials, fuel and lubricants, equipment, Machinery, Plant and other Materials or inputs in accordance with the principles, procedures and formulae specified below:¹⁵

¹⁵The following changes may be made for project specific cases:

- (a) For project which includes both (i) civil and track works, and (ii) signalling and telecommunication works, retain paragraphs (c), (d), (e), (f), (g) and (h); and delete paragraphs (i), (j) and (k) relating to electrification works.
- (b) For project for signalling and telecommunication works only, delete paragraphs (c), (d), (e) relating to civil works and track works, renumber paragraphs (f), (g) and (h) as (c), (d) and (e) respectively; and change reference to sub-paragraph (h) to sub-paragraph (e) in the renumbered paragraphs; and delete paragraphs (i), (j) and (k) relating to electrification works.
- (c) For electrification works only, delete paragraphs (c), (d), (e) relating to civil works and track work, delete paragraphs (f), (g) and (h) relating to signalling and telecom works; renumber paragraphs (i), (j) and (k) relating to electrification works as (c), (d) and (e) respectively; and also change reference to sub-paragraph (k) to sub-paragraph (e) in the renumbered paragraphs.



- (a) Price adjustment shall be applied on completion of the specified stage of the respective item of work in accordance with Schedule-G. The 1st Quarter will start from Bid Due date month;
- (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 for civil and track work:

EW = Value of work done for the completion of a stage under the item earthwork;

BRIMP = Value of work done for the completion of a stage under the item Important Bridges;

BR = Value of work done for the completion of a stage under the items Major Bridges, Minor Bridges, RCC box/pipe culverts, Flyovers, RUB, and ROB in accordance with Schedule-G;

TRK = Value of work done for the completion of a stage under the item Track Works;

TUNL = Value of work done for the completion of a stage under the items Tunnel;

OEW = Value of work done for the completion of a stage under the item Other Engineering Works;

INVCIV = Value of work done for under the item inventory;

INTGTESTCIV = Value of work done for the item integrated testing and commissioning of the Railway Project.

- (d) Price adjustment for change in costs of civil and track work shall be paid in accordance with the following formula:
 - (i) $VEW = 0.85 EW \times [PLB \times (L_{Bi} - L_{Bo})/L_{Bo} + PC \times (C_i - C_o)/C_o + PF \times (F_i - F_o)/F_o + PMACH \times (MACH_i - MACH_o)/MACH_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
 - (ii) $VBRIMP = 0.85 BRIMP \times [PLB \times (L_{Bi} - L_{Bo})/L_{Bo} + PC \times (C_i - C_o)/C_o + PS \times (S_i - S_o)/S_o + PF \times (F_i - F_o)/F_o + PMACH \times (MACH_i - MACH_o)/MACH_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
 - (iii) $VBR = 0.85 BR \times [PLB \times (L_{Bi} - L_{Bo})/L_{Bo} + PC \times (C_i - C_o)/C_o + PS \times (S_i - S_o)/S_o + PF \times (F_i - F_o)/F_o + PMACH \times (MACH_i - MACH_o)/MACH_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
 - (iv) $VTRK = 0.85 TRK \times [PLB \times (L_{Bi} - L_{Bo})/L_{Bo} + PC \times (C_i - C_o)/C_o + PS \times (S_i - S_o)/S_o + PF \times (F_i - F_o)/F_o + PMACH \times (MACH_i - MACH_o)/MACH_o + POTH \times (OTH_i - OTH_o)/OTH_o + PR \times (R_i -$



$R_o)/R_o]$;

- (v) $VTUNL = 0.85 TUNL \times [PLB \times (L_{Bi} - L_{Bo})/L_{Bo} + PC \times (C_i - C_o)/C_o + PS \times (S_i - S_o)/S_o + PF \times (F_i - F_o)/F_o + PMACH \times (MACH_i - MACH_o)/MACH_o + POTH \times (OTH_i - OTH_o)/OTH_o + PXL P \times (XLP_i - XLP_o)/XLP_o]$;
- (vi) $VOEW = 0.85 OEW \times [PLB \times (L_{Bi} - L_{Bo})/L_{Bo} + PC \times (C_i - C_o)/C_o + PS \times (S_i - S_o)/S_o + PF \times (F_i - F_o)/F_o + PMACH \times ((MACH_i - MACH_o)/MACH_o + POTH \times (OTH_i - OTH_o)/OTH_o)]$;
- (vii) $VINVCIV = 0.85 INVCIV \times [PR \times (R_i - R_o)/R_o + POTH \times (OTH_i - OTH_o)/OTH_o]$; and
- (viii) $VINTGTESTCIV = 0.85 INTGTESTCIV \times [PLB \times (L_{Bi} - L_{Bo})/L_{Bo} + POTH \times (OTH_i - OTH_o)/OTH_o]$;

Where

VEW = Increase or decrease in the cost of earthwork during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (e);

VBRIMP = Increase or decrease in the cost of Important Bridges during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (e);

VBR = Increase or decrease in the cost of Major Bridges, Minor Bridges, Flyovers, RCC box/pipe culverts ROB/RUB) during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (e);

VTRK = Increase or decrease in the cost of track works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (e);

VTUNL = Increase or decrease in the cost of tunnels during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (e);

VOEW = Increase or decrease in the cost of Other Engineering Works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (e);

VINVCIV = Increase or decrease in the cost of inventory during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (e);

VINTGTESTCIV = Increase or decrease in the cost of integrated testing and commissioning during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (e);



PC, PF, PLB, PMACH, POTH, PR, PS and PXLPL are the percentages of cement, fuel and lubricants, labour, Plant Machinery and tools, other materials, rails, steel/ components (including strands and steel cables), and explosives respectively for the relevant item as specified in sub-paragraph (e);

Co = The wholesale price index as published by the Ministry of Commerce and Industry, Government of India (hereinafter called “WPI”) for sub-group Cement, Lime & Plaster for the month of the Base Month;

Ci = The WPI for sub-group Cement, Lime & Plaster for the average price index of the 3 months of the quarter under consideration;

Fo = The wholesale price index as published by the Ministry of Commerce and Industry, Government of India (hereinafter called “WPI”) for group Fuel & Power for the month of the Base Month

Fi = The WPI for group Fuel & Power for the average price index of the 3 months of the quarter under consideration

LBo = The consumer price index for industrial workers – All India, published by Labour Bureau, Ministry of Labour, Government of India, (hereinafter called “CPI”) for the month of the Base Month;

LBi = The CPI for industrial workers – All India for the average price index of the 3 months of the quarter under consideration;

MACHo = The wholesale price index as published by the Ministry of Commerce and Industry, Government of India (hereinafter called “WPI”) for category- k “Manufacturing of Machinery for Mining, quarrying and construction’ under (R) Manufacturing of Machinery and Equipment for the month of the Base Month;

MACHi = The WPI for category- k “Manufacturing of Machinery for Mining, quarrying and construction’ under (R) Manufacturing of Machinery and Equipment for the average price index of the 3 months of the quarter under consideration;

OTHo = The wholesale price index as published by the Ministry of Commerce and Industry, Government of India (hereinafter called “WPI”) for all commodities for the month of the Base Month;

OTHi = The WPI for all commodities for the average price index of the 3 months of the quarter under consideration;

Ro = The Price for Rails (60kg) published by the Bhilai Plant of the Steel Authority of India for the month of the Base Month;

Ri = The Price for Rails (60kg) published by the Bhilai Plant of the Steel Authority of India for the month which is three months prior to the month to which the IPC relates;

So = The rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in clause 17.8.4(A) as published for the month of the Base Month;



Si = The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in clause 17.8.4-A as published for the 3 months of the quarter under consideration;

XLPo = The wholesale price index as published by the Ministry of Commerce and Industry, Government of India (hereinafter called “WPI”) for explosives for the month of the Base Month; and

XLPI = The WPI for explosives for the average price index of the 3 months of the quarter under consideration.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29. 050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

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

Component	Earthwork	Important Bridges	Major Bridges/ Flyovers/ Minor Bridges, CC Box/Pipe Culverts, ROB/RUB	Track works	Tunnels	Other Engineering works	Inventory	Integrated Testing and Commissioning
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cement (PC)	-	-	20%	-	-	20%	-	-
Explosives (PXL P)	-	-	-	-	-	-	-	-
Fuel and lubricants (PF)	25%	-	15%	25%	-	15%	-	-
Labour (PLB)	20%	-	20%	40%	-	25%	-	-
Machinery and Plants (PMACH)	40%	-	10%	20%	-	10%	-	-
Other Materials (POTH)	15%	-	10%	15%	-	15%	-	-
Rail (PR)	-	-	-	-	-	-	-	-
Steel (PS)	-	-	25%	-	-	15%	-	-
Total	100%	-	100%	100%	-	100%	-	-



- (f) The following expressions and meanings are assigned to the value of the work done for signalling and telecommunication works:

SIGWK = Value of signalling works for a stage payment of the item signalling works;

INVSIG = Value of inventory for signalling works for a stage payment of the item inventory for signalling works;

INTGTESTSIG = Value of integrated testing and commission for signalling works of the Railway Project;

COMWK = Value of telecommunication works for a stage payment of the item telecommunication works;

INVCOM = Value of inventory for telecommunication works for a stage payment of the item inventory for telecommunication works; and

INTGTESTCOM = Value of integrated testing and commission for telecommunication works of the Railway Project.

- (g) Price adjustment for changes in cost of signalling works and telecommunication works shall be paid in accordance with the following formula:

$$(i) \quad VSIGWK = 0.85 \text{ SIGWK} \times [\text{PELEX} \times (\text{ELEX}_i - \text{ELEX}_o) / \text{ELEX}_o + \text{POFC} \times (\text{OFC}_i - \text{OFC}_o) / \text{OFC}_o + \text{PLB} \times (\text{LBI} - \text{LBO}) / \text{LBO} + \text{POTH} \times (\text{OTH}_i - \text{OTH}_o) / \text{OTH}_o + \text{S30C} \times (\text{P30C}_i - \text{P30C}_o) / \text{P30C}_o + \text{S24C} \times (\text{P24C}_i - \text{P24C}_o) / \text{P24C}_o + \text{S19C} \times (\text{P19C}_i - \text{P19C}_o) / \text{P19C}_o + \text{S12C} \times (\text{P12C}_i - \text{P12C}_o) / \text{P12C}_o + \text{S9C} \times (\text{P9C}_i - \text{P9C}_o) / \text{P9C}_o + \text{S6C} \times (\text{P6C}_i - \text{P6C}_o) / \text{P6C}_o + \text{S4C} \times (\text{P4C}_i - \text{P4C}_o) / \text{P4C}_o + \text{S2C} \times (\text{P2C}_i - \text{P2C}_o) / \text{P2C}_o + \text{S12C2.5} \times (\text{P12C2.5}_i - \text{P12C2.5}_o) / \text{P12C2.5}_o + \text{S2C2.5} \times (\text{P2C2.5}_i - \text{P2C2.5}_o) / \text{P2C2.5}_o + \text{S2C25} \times (\text{P2C25}_i - \text{P2C25}_o) / \text{P2C25}_o + \text{QC} \times (\text{PQC}_i - \text{PQC}_o) / \text{PQC}_o];$$

$$(ii) \quad VINVSIG = 0.85 \text{ SIGWK} \times [\text{PELEX} \times (\text{ELEX}_i - \text{ELEX}_o) / \text{ELEX}_o + \text{POTH} \times (\text{OTH}_i - \text{OTH}_o) / \text{OTH}_o];$$

$$(iii) \quad VINTGTESTSIG = 0.85 \text{ INTGTESTSIG} \times [\text{PLB} \times (\text{LBI} - \text{LBO}) / \text{LBO} + \text{POTH} \times (\text{OTH}_i - \text{OTH}_o) / \text{OTH}_o];$$

$$(iv) \quad VCOMWK = 0.85 \text{ COMWK} \times [\text{PELEX} \times (\text{ELEX}_i - \text{ELEX}_o) / \text{ELEX}_o + \text{POFC} \times (\text{OFC}_i - \text{OFC}_o) / \text{OFC}_o + \text{PLB} \times (\text{LBI} - \text{LBO}) / \text{LBO} + \text{POTH} \times (\text{OTH}_i - \text{OTH}_o) / \text{OTH}_o + \text{S30C} \times (\text{P30C}_i - \text{P30C}_o) / \text{P30C}_o + \text{S24C} \times (\text{P24C}_i - \text{P24C}_o) / \text{P24C}_o + \text{S19C} \times (\text{P19C}_i - \text{P19C}_o) / \text{P19C}_o + \text{S12C} \times (\text{P12C}_i - \text{P12C}_o) / \text{P12C}_o + \text{S9C} \times (\text{P9C}_i - \text{P9C}_o) / \text{P9C}_o + \text{S6C} \times (\text{P6C}_i - \text{P6C}_o) / \text{P6C}_o + \text{S4C} \times (\text{P4C}_i - \text{P4C}_o) / \text{P4C}_o + \text{S2C} \times (\text{P2C}_i - \text{P2C}_o) / \text{P2C}_o + \text{S12C2.5} \times (\text{P12C2.5}_i - \text{P12C2.5}_o) / \text{P12C2.5}_o];$$



$$+ S2C2.5 \times (P2C2.5_i - P2C2.5_o) / P2C2.5_o + S2C25 \times (P2C25_i - P2C25_o) / P2C25_o + QC \times (PQC_i - PQC_o) / PQC_o + PCEQP \times (CEQP_i - CEQP_o) / CEQP_o];$$

- (v) $VINVCOM = 0.85 \text{ SIGWK} \times [PELEX \times (ELEX_i - ELEX_o) / ELEX_o + PCEQP \times (CEQP_i - CEQP_o) / CEQP_o + POTH \times (OTH_i - OTH_o) / OTH_o];$ and
- (vi) $VINTGTESTCOM = 0.85 \text{ INTGTESTCOM} \times [PLB \times (LB_i - LB_o) / LB_o + POTH \times (OTH_i - OTH_o) / OTH_o].$

Where

VSIGWK = Increase or decrease in the cost of signalling works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VINVSIG = Increase or decrease in the cost of inventory for signalling during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VINTGTESTSIG = Increase or decrease in the cost of integrated testing and commissioning of signalling works of the Railway Project during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VCOMWK = Increase or decrease in the cost of communication works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VINVCOM = Increase or decrease in the cost of inventory for telecommunications works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VINTGTESTCOM = Increase or decrease in the cost of integrated testing and commissioning of telecommunication works of the Railway Project during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

PCEQP, PELEX, PIC, PLB, POFC, and POTH are the percentages of communication equipment, electronics, PVC insulated cables, labour, optical fibre cables, and other materials respectively;

CEQP_o = The wholesale price index as published by the Ministry of Commerce and Industry, Government of India (hereinafter called “WPI”) for communication equipment for the month of the Base Month ;

CEQP_i = The WPI for communication equipment for the average price index of the 3 months of the quarter under consideration;



$ELEX_o$ = The WPI for electronics for the month of the Base Month;

$ELEX_i$ = The WPI for electronics for the average price index of the 3 months of the quarter under consideration;

$P30C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 30C x 1.5 sq mm signalling cable

$P30C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

$S30C$ = Percentage of size 30C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P24C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 24C x 1.5 sq mm signalling cable

$P24C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

$S24C$ = Percentage of size 24C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P19C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 19C x 1.5 sq mm signalling cable

$P19C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

$S19C$ = Percentage of size 19C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P12C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 12C x 1.5 sq mm signalling cable

$P12C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

$S12C$ = Percentage of size 12C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P9C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 9C x 1.5 sq mm signalling cable

$P9C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

$S9C$ = Percentage of size 9C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P6C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 6C x 1.5 sq mm signalling cable

$P6C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

$S6C$ = Percentage of size 6C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P4C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 4C x 1.5 sq mm signalling cable

$P4C_o$ = Price per Km of cable as per purchase order/ Contract agreement.



S4C = Percentage of size 4C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P2C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 1.5 sq mm signalling cable

P2C_o = Price per Km of cable as per purchase order/ Contract agreement.

S2C = Percentage of size 2C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P12C2.5_i = Price payable per Km as adjusted in accordance with price variation Clause for size 12C x 2.5 sq mm signalling cable

P12C2.5_o = Price per Km of cable as per purchase order/ Contract agreement.

S12C2.5 = Percentage of size 12C x 2.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P2C2.5_i = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 2.5 sq mm signalling cable

P2C2.5_o = Price per Km of cable as per purchase order/ Contract agreement.

S2C2.5 = Percentage of size 2C x 2.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P2C25_i = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 25 sq mm signalling cable

P2C25_o = Price per Km of cable as per purchase order/ Contract agreement.

S2C25 = Percentage of size 2C x 25 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

PQC_i = Price payable per Km as adjusted in accordance with price variation Clause for size 0.9mm dia, 6 Quad cable.

PQC_o = Price per Km of cable as per purchase order/ Contract agreement.

QC = Percentage of size 0.9mm dia, 6 Quad cable shall govern the price.

LBo = The consumer price index for industrial workers – All India, published by Labour Bureau, Ministry of Labour, Government of India, (hereinafter called “CPI”) for the month of the Base Month;

LBi = The CPI for industrial workers – All India for the average price index of the 3 months of the quarter under consideration;

OFCo = The WPI for fibre cables for the month of the Base Month;

OFCi = The WPI for fibre cables for the average price index of the 3 months of the quarter under consideration;

OTHo = The WPI for all commodities for the month of the Base Month; and



OTHi = The WPI for all commodities for the average price index of the 3 months of the quarter under consideration.

- (h) The following percentages shall govern the price adjustment of the Contract Price for signalling and telecommunication works:

Component	Signalling & Telecommunication		
	S&T Works	S&T Inventory	Integrated testing and Commissioning
Electronics (PELEX)	34.89%	100.00%	100.00%
Communication Equipment (PCEQP)	12.50%		
Optical Fibre Cable (POFC)	3.90%		
12C x 1.5 sq mm signalling cable (S12C)	18.54%		
6C x 1.5 sq mm signalling cable (S6C)			
0.9 mm dia, 6Quad cable (QC)	6.65%		
Labour (PLB)	20.00%		
Other materials	3.52%		
Total	100%	100%	100%

(a) PRICE VARIATION FORMULA FOR SIGNALING & TELECOM CABLE

The price payable for signalling cables is variable as per Price Variation Formula given below:

For Signalling Copper Cables:

$$P_i = P_o + CuF (Cu - Cu_o) + CCFcu(CC - CC_o) + FeF (Fe - Fe_o)$$

For Telecom Copper Cables For Jelly Filled, 0.9 mm dia, 6 quad cable

$$P_i = P_o + CuF (Cu - Cu_o) + AlFcu(Al - Al_o) + CCFcu (CC - Cc_o) + FeF (Fe - Fe_o)$$



For Aluminium Power Cables:

$$P_i = P_o + AIF (Al - A_o) + CCFAl(CC - CCo) + FeF (Fe - Fe_o)$$

Where,

P_i = Price payable per KM as adjusted in accordance with Price variation clause.

P_o = Price per KM of cable as per Purchase order.

CuF = Variation factor for Copper

Cu_o = Price of copper Rod in Rs. Per MT

$CCFCu$ = Variation factor for PVC Compound for Copper Signalling & Telecom cable

CCo = Price of PVC Compound in Rs. Per MT

AIF = Variation factor for Aluminium

A_o = Price of EC grade LME Aluminium rods (Properzi rods) in Rs. Per MT.

$CCFAl$ = Variation factor for PVC Compound for Aluminium power cable

FeF = Variation factor for Steel

Fe_o = Price of Steel for Armour (Flat strip 4 mm. x 0.8mm/ Round 1.4mm dia) in Rs. Per MT

(Prices per MT for Cu_o , CCo , Fe_o , A_o as applicable on the 1st working day of the month, one month prior to the deadline for submission of bids. The above prices and indices are as published by IEEMA vide circular reference no. IEEMA (PVC) /CABLE --/--/-- one month prior to the deadline for submission of bids.)

Cu = Price of Copper Rod in Rs. Per MT.

CC = Price of PVC Compound in Rs. Per MT.

Fe = Price of Steel for Armouring (Flat strip 4mm x 0.8 mm/ Round 1.4mm dia) in Rs. Per MT.

Al = Price of EC grade LME Aluminium rods (Properzi rods) in Rs. Per MT.

(Prices per MT for Cu , CC , Fe , Al as prevailing on 1st working day of the calendar month covering the date One month prior to the date of inspection call letter will be applicable for the calculation of updated price. The above prices and indices are as published by IEEMA vide circular reference no. IEEMA (PVC) /CABLE --/--/-- one month prior to the date of inspection.)

The value of variation factors for copper, steel and PVC Compound are different for different sizes of signalling cables. Accordingly, the PVC formula for some of the types of signalling cable is as given under:-

Underground Railway Signalling Cable unscreened and armoured copper conductor

- (i) Size 30 C x 1.5 sq.mm.

$$P30C_i = P30C_o + 0.391(Cu - C_u_o) + 0.557(CC - CCo) + 0.425(Fe - Fe_o)$$

For armouring, price of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (ii) Size 24C x 1.5 sq.mm



$$P24C_i = P24Co + 0.313(Cu-Cuo) + 0.481(CC-CCo) + 0.398(Fe-Feo)$$

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (iii) Size 19C x 1.5 sq.mm

$$P19C_i = P19Co + 0.248(Cu-Cuo) + 0.395(CC-CCo) + 0.343(Fe-Feo)$$

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (iv) Size 12C x 1.5 sq.mm

$$P12C_i = P12Co + 0.157(Cu-Cuo) + 0.277(CC-CCu) + 0.289(Fe-Feo)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (v) Size 9C x 1.5 sq.mm

$$P9C_i = P9Co + 0.117(Cu-Cuo) + 0.241(CC-CCu) + 0.383(Fe-Feo)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (vi) Size 6Cx 1.5 sq.mm

$$P6C_i = P6Co + 0.078(Cu-Cuo) + 0.199(CC-CCu) + 0.329(Fe-Feo)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (vii) Size 4Cx1.5 sq.mm

$$P4C_i = P4Co + 0.052(Cu-Cuo) + 0.152(CC-CCo) + 0.277(Fe-Feo)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (viii) Size 2C x 4 sq.mm(multistrand)

$$P2C_i = P2Co + 0.073(Cu-Cuo) + 0.156(CC-CCo) + 0.3(Fe-Feo)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (ix) Size 12C x 2.5 sq.mm

$$P12C2.5_i = P12C2.5o + 0.282(Cu-Cuo) + 0.371(CC-CCo) + 0.342(Fe-Feo)$$

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (x) Size 2C x 2.5 sq.mm

$$P2C2.5_i = P2C2.5o + 0.047(Cu-Cuo) + 0.139(CC-CCo) + 0.277(Fe-Feo)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (xi) Size 2C x 25 sq.mm PVC insulated, armoured, Aluminium power cable

$$P2C25_i = P2C25o + 0.146(Al-Alo) + 0.303(CC-CCo) + 0.306(Fe-Feo)$$

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (xii) For Jelly filled, 0.9mm dia, 6 quad cable

$$PQC_i = PQC_o + 0.135(Al-Alo) + 0.139(Cu-Cuo) + 0.515(CC-Cco) + 0.693(Fe-Feo)$$

For PVC Compound Grade CW-22, is to be taken into consideration.



- (i) The following expressions and meanings are assigned to the value of the work done for electrification works:

OHE = Value of work done for the completion of a stage under the item Overhead Equipment Work;

SP = Value of work done for the completion of a stage under the item Switching Posts;

TRANSBOO = Value of work done for the completion of a stage under the item Booster Transformer;

TRANSAUX = Value of work done for the completion of a stage under the item Auxiliary Transformer;

TSS = Value of work done for the completion of a stage under the item Traction Sub Station;

TLOH = Value of work done for the completion of a stage under the item High Voltage Transmission Line Overhead including monopole;

TLUG = Value of work done for the completion of a stage under the item Underground High Tension Cable Transmission Line;

BAY = Value of work done for the completion of a stage under the item Bay Augmentation work at Grid Sub-Station/Terminal arrangement at TSS;

SCADA = Value of work done for the completion of a stage under the item SCADA;

ELEGWK = Value of work done for the completion of a stage under the item various electrical general services works;

MODHTPWRLINE = Value of work done for the completion of a stage under the item modification of HT power lines and crossings (raising of height);

MODHTLTOUG = Value of work done for the completion of a stage under the item modification of HT power lines and crossings to underground (replacement by underground cabling);

MODLTLTOUG = Value of work done for the completion of a stage under the item modification of LT power lines and crossings to underground (replacement by underground cabling);

EXTNLTPWRSPLY = Value of work done for the completion of a stage under the item extension/augmentation of power supply for CLS work;

EXTNPWRSUPPLY = Value of work done for the completion of a stage under the item extension/augmentation of general power supply;

MODELECTRICAL = Value of work done for the completion of a stage under the item modification to existing electrical works;

INELECTRICAL = Value of work done for the completion of a stage under the item inventory electrical;



SIGMOD = Value of work done for the completion of a stage under the item Signalling System Modification;

INVSIG = Value of work done for the completion of a stage under the item signalling inventory;

TESTSIG = Value of work done for the completion of a stage under the item integrated testing and commissioning;

COMMODO = Value of work done for the completion of a stage under the item Telecommunications modifications;

INVCOMO = Value of work done for the completion of a stage under the item telecommunication inventory;

TESTCOMO = Value of work done for the completion of a stage under the item integrated testing and commissioning; and

CIVENG = Value of work done for the completion of a stage under the item Civil Engineering works.

(j) Price adjustment for changes in cost for electrification works shall be paid in accordance with the following formula:

$$(i) \quad VOHE = 0.85 \text{ OHE} \times [PLB \times (LB_i - LB_o)/LB_o + PC \times (C_i - C_o)/C_o + PSST \times (SST_i - SST_o)/SST_o + PCU \times (CU_i - CU_o)/CU_o + PINS \times (INS_i - INS_o)/INS_o];$$

$$(ii) \quad VSP = 0.85 \text{ SP} \times [PLB \times (LB_i - LB_o)/LB_o + PC \times (C_i - C_o)/C_o + PSWGR \times (SWGR_i - SWGR_o)/SWGR_o];$$

$$(iii) \quad VTRANSBOO = 0.85 \text{ TRANSBOO} \times [PLB \times (LB_i - LB_o)/LB_o + PSST \times (SST_i - SST_o)/SST_o + PTR \times (TR_i - TR_o)/TR_o];$$

$$(iv) \quad VTRANSAUX = 0.85 \text{ TRANSAUX} \times [PLB \times (LB_i - LB_o)/LB_o + PSST \times (SST_i - SST_o)/SST_o + PTR \times (TR_i - TR_o)/TR_o];$$

$$(v) \quad VTSS = 0.85 \text{ TSS} \times [PLB \times (LB_i - LB_o)/LB_o + PTR \times (TR_i - TR_o)/TR_o + PC \times (C_i - C_o)/C_o + PSST \times (SST_i - SST_o)/SST_o + PSWGR \times (SWGR_i - SWGR_o)/SWGR_o];$$

$$(vi) \quad VTLOH = 0.85 \text{ TLOH} \times [PLB \times (LB_i - LB_o)/LB_o + PSST \times (SST_i - SST_o)/SST_o + PCOND \times (COND_i - COND_o)/COND_o + PC \times (C_i - C_o)/C_o + PINS \times (INS_i - INS_o)/INS_o + POTH \times (OTH_i - OTH_o)/OTH_o];$$

$$(vii) \quad VTLUG = 0.85 \text{ TLUG} \times [PLB \times (LB_i - LB_o)/LB_o + PPC \times (PC_i - PC_o)/PC_o];$$

$$(viii) \quad VBAY = 0.85 \text{ BAY} \times [PLB \times (LB_i - LB_o)/LB_o + PSST \times (SST_i - SST_o)/SST_o + PC \times (C_i - C_o)/C_o + PCU \times (CU_i - CU_o)/CU_o];$$

$$(ix) \quad VSCADA = 0.85 \text{ SCADA} \times [PLB \times (LB_i - LB_o)/LB_o + PELEX \times (ELEX_i - ELEX_o)/ELEX_o];$$

$$(x) \quad VELEGWK = 0.85 \text{ ELEGW} \times [PLB \times (LB_i - LB_o)/LB_o + POTH \times (OTH_i - OTH_o)/OTH_o];$$



- (xi) $V_{MODHTPWRLINE} = 0.85 \text{ MODHTPWRLINE} \times [PLB \times (LB_i - LB_o)/LB_o + PSST \times (SST_i - SST_o)/SST_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xii) $V_{MODHTLTOUG} = 0.85 \text{ MODHTLTOUG} \times [PLB \times (LB_i - LB_o)/LB_o + PPC \times (PC_i - PC_o)/PC_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xiii) $V_{MODLTLTOUG} = 0.85 \text{ MODLTLTOUG} \times [PLB \times (LB_i - LB_o)/LB_o + PPC \times (PC_i - PC_o)/PC_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xiv) $V_{EXTNLTWPWSPLY} = 0.85 \text{ EXTNLTWPWSPLY} \times [PLB \times (LB_i - LB_o)/LB_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xv) $V_{EXTNPWRSUPPLY} = 0.85 \text{ EXTNPWRSUPPLY} \times [PLB \times (LB_i - LB_o)/LB_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xvi) $V_{MODELETRICAL} = 0.85 \text{ MODELETRICAL} \times [PLB \times (LB_i - LB_o)/LB_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xvii) $V_{INELECTRICAL} = 0.85 \text{ INELECTRICAL} \times [POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xviii) $V_{SIGMOD} = 0.85 \text{ SIGMOD} \times [PLB \times (LB_i - LB_o)/LB_o + PELEX \times (ELEX_i - ELEX_o)/ELEX_o + PPC \times (PC_i - PC_o)/PC_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xix) $V_{INVSIG} = 0.85 \text{ INVSIG} \times [POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xx) $V_{TESTSIG} = 0.85 \text{ TESTSIG} \times [PLB \times (LB_i - LB_o)/LB_o + POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xxi) $V_{COMMOD} = 0.85 \text{ COMMOD} \times [PLB \times (LB_i - LB_o)/LB_o + PELEX \times (ELEX_i - ELEX_o)/ELEX_o + POFC \times (OFC_i - OFC_o)/OFC_o]$;
- (xxii) $V_{INVCOM} = 0.85 \text{ INVCOM} \times [POTH \times (OTH_i - OTH_o)/OTH_o]$;
- (xxiii) $V_{TESTCOM} = 0.85 \text{ TESTCOM} \times [PLB \times (LB_i - LB_o)/LB_o + POTH \times (OTH_i - OTH_o)/OTH_o]$; and
- (xxiv) $V_{CIVENG} = 0.85 \times V_{CIVENG} \times [PLB \times (LB_i - LB_o)/LB_o + PS \times (S_i - S_o)/S_o + PC \times (C_i - C_o)/C_o + POTH \times (OTH_i - OTH_o)/OTH_o]$.

Where

VOHE = Increase or decrease in the cost of Over Head Equipment and other related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VSP = Increase or decrease in the cost of Switch Post and other related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VTRANSBOO = Increase or decrease in the cost of booster transformer and other related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);



VTRANS AUX = Increase or decrease in the cost of auxiliary transformer and other related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VTSS = Increase or decrease in the cost of Traction Sub-Station and other related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VTLOH = Increase or decrease in the cost of overhead transmission line and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VTLUG = Increase or decrease in the cost of underground high voltage transmission line and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VBAY = Increase or decrease in the cost of bay augmentation work at grid sub-station/ terminal arrangement at TSS and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VSCADA = Increase or decrease in the cost of SCADA and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VELEGWK = Increase or decrease in the cost of various electrical general services works and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VMODHTPWRLINE = Increase or decrease in the cost of modification of HT power lines and crossings (raising of height) and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VMODHTLTOUG = Increase or decrease in the cost of modification of HT power lines and crossings to underground (replacement by underground cabling) and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VMODLTLTOUG = Increase or decrease in the cost of modification of LT power lines and crossings to underground (replacement by underground cabling) and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VEXTNLTPWRSPLY = Increase or decrease in the cost of extension/augmentation of power supply for CLS work and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VEXTNPWRSUPPLY = Increase or decrease in the cost of extension/augmentation of general power supply and related works during



the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VMODELETICAL = Increase or decrease in the cost of modification to existing electrical works and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VINVELECTRICAL = Increase or decrease in the cost of inventory electrical during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VSIGMOD = Increase or decrease in the cost of signalling system modification and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VINVSIG = Increase or decrease in the cost of signalling inventory during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VTESTSIG = Increase or decrease in the cost of SCADE and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VCOMMODO = Increase or decrease in the cost of communication and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VINVCOM = Increase or decrease in the cost of telecommunication inventory during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VTESTCOM = Increase or decrease in the cost of integrated testing and commissioning and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VCIVENG = Increase or decrease in the cost of civil engineering and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

PC, PCOND, PCU, PELEX, PINS, PLB, POFC, PSWGR, , PPC, and PSST are the percentages of cement, conductor, copper wire, electronic items, insulators, labour, fibre optic cables, electrical switch gears, PVC insulated cable and structural steel respectively for the relevant item as specified in sub-paragraph (k);

Co = The wholesale price index as published by the Ministry of Commerce & Industry, Government of India (hereinafter called “WPI”) for cement, lime, plaster for the month of the Base Month;

Ci = The WPI for cement, lime, plaster for the average price index of the 3 months of the quarter under consideration;



CONDo = Aluminium LME SELLER Settlement Price including Premium for AL Ingots and Customs duty published by IEEMA for the month of the Base Month;

CONDi = Aluminium LME SELLER Settlement Price including Premium for AL Ingots and Customs duty published by IEEMA for the average price index of the 3 months of the quarter under consideration;

CUo = Copper: (Cu) Price of copper wire rod published by IEEMA for the month of the Base Month;

CUi= Copper: (Cu) Price of copper wire rod published by IEEMA for the average price index of the 3 months of the quarter under consideration;

ELEXo = The WPI for Manufacture OF Electronic Components for the month of the Base Month;

ELEXi = The WPI for Manufacture OF Electronic Components for the average price index of the 3 months of the quarter under consideration;

INSo = The WPI for insulators for the month of the Base Month;

INSi = The WPI for insulators for the average price index of the 3 months of the quarter under consideration;

LBo = The consumer price index for industrial workers – All India, published by Labour Bureau, Ministry of Labour, Government of India, (hereinafter called “CPI”) for the month of the Base Month;

LBi = The CPI for industrial workers – All India for the average price index of the 3 months of the quarter under consideration

OFCo = The WPI for optical fibre cables for the month of the Base Month;

OFCi = The WPI for optical fibre cables for the average price index of the 3 months of the quarter under consideration;

OTHo = The WPI for all commodities for the month of the Base Month;

OTHi = The WPI for all commodities for the average price index of the 3 months of the quarter under consideration;

PCo = The WPI for PVC insulated cable for the month of the Base Month;

PCi = The WPI for PVC insulated cable for the average price index of the 3 months of the quarter under consideration;

So = The WPI for steel (rods) for the month of the Base Month;

Si = The WPI for steel (rods) for the average price index of the 3 months of the quarter under consideration;

SSTo = Price for BLOOMS-Retail (SBLR) 150mmx150mm published by IEEMA for the month of the Base Month;

SSTi = Price for BLOOMS-Retail (SBLR) 150mmx150mm published by IEEMA for the average price index of the 3 months of the quarter under consideration;



SWGR_o = The WPI for MANUFACTURE OF ELECTRICAL EQUIPMENT for the month of the Base Month;

SWGR_i = The WPI for MANUFACTURE OF ELECTRICAL EQUIPMENT for the average price index of the 3 months of the quarter under consideration;

TR_o = The WPI for transformers for the month of the Base Month; and

TR_i = The WPI for transformers for the average price index of the 3 months of the quarter under consideration.

P30C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 30C x 1.5 sq mm signalling cable

P30C_o = Price per Km of cable as per purchase order/ Contract agreement.

S30C = Percentage of size 30C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P24C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 24C x 1.5 sq mm signalling cable

P24C_o = Price per Km of cable as per purchase order/ Contract agreement.

S24C = Percentage of size 24C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P19C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 19C x 1.5 sq mm signalling cable

P19C_o = Price per Km of cable as per purchase order/ Contract agreement.

S19C = Percentage of size 19C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P12C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 12C x 1.5 sq mm signalling cable

P12C_o = Price per Km of cable as per purchase order/ Contract agreement.

S12C = Percentage of size 12C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P9C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 9C x 1.5 sq mm signalling cable

P9C_o = Price per Km of cable as per purchase order/ Contract agreement.

S9C = Percentage of size 9C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P6C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 6C x 1.5 sq mm signalling cable

P6C_o = Price per Km of cable as per purchase order/ Contract agreement.



S6C = Percentage of size 6C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P4C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 4C x 1.5 sq mm signalling cable

P4C_o = Price per Km of cable as per purchase order/ Contract agreement.

S4C = Percentage of size 4C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P2C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 1.5 sq mm signalling cable

P2C_o = Price per Km of cable as per purchase order/ Contract agreement.

S2C = Percentage of size 2C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P12C2.5_i = Price payable per Km as adjusted in accordance with price variation Clause for size 12C x 2.5 sq mm signalling cable

P12C2.5_o = Price per Km of cable as per purchase order/ Contract agreement.

S12C2.5 = Percentage of size 12C x 2.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P2C2.5_i = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 2.5 sq mm signalling cable

P2C2.5_o = Price per Km of cable as per purchase order/ Contract agreement.

S2C2.5 = Percentage of size 2C x 2.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P2C25_i = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 25 sq mm signalling cable

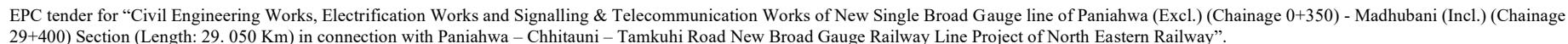
P2C25_o = Price per Km of cable as per purchase order/ Contract agreement.

S2C25 = Percentage of size 2C x 25 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

PQC_i = Price payable per Km as adjusted in accordance with price variation Clause for size 0.9mm dia, 6 Quad cable.

PQC_o = Price per Km of cable as per purchase order/ Contract agreement.

QC = Percentage of size 0.9mm dia, 6 Quad cable shall govern the price



(i) For OHE works:

[illegible]



(ii) For SWITCHING STATION WORKS:

Component	FOR SWITCHING STATION				
	2.1 Design, Drawing, Earth work (including filling/cutting , compaction), completion of all Equipment - Foundations and all civil work of SWS like structure foundation, fencing	2.2 Supply and Erection of steel structures complete	2.3 Supply and erection of all equipment including electrical switchgears & control panels, SWS bus-bar, ATs except Auto transformers	2.4 Supply and Erection of AutoTransformers	2.5 Completion of Testing, commissioning and charging of SWS including all miscellaneous items, EIG certification
Labour (PLB)	2.47%	4.64%	4.90%	4.76%	12.69%
Cement (PC)	75.73%	-	-	-	-
Structural steel (PSST)	21.80%	95.36%	-	-	37.82%
Insulators (PINS)	-	-	6.48%	-	-
Copper wire (PCU)	-	-	3.00%	-	-
Transformer (PTR)	-	-	-	95.24%	-
Electrical Switch Gear (PSWGR)	-	-	76.51%	-	-
PVC Cables (PIC)	-	-	2.53%	-	-
All other commodities (POTH)	-	-	6.58%	-	49.49%
Total	100%	100%	100%	100%	100%



(iii) For SCADA Works:

Component	SCADA	
	3.1 Supply and erection of remote terminal units at all switching post and TSS	3.2 Final Commissioning of SCADA at RCC and switching post/TSS
Labour (PLB)	8.84%	10.64%
Electronics (PELEX)	91.16%	86.58%
PVC Insulated Cable (PIC)	-	-
Fibre Cable (POFC)	-	-
All other commodities (POTH)	-	2.78%
Total	100%	100%



(iv) For Automatic Fault Locator Works:

Component	Automatic Fault Locator	
	4.1 Supply and erection of Automatic Fault Locator panel units at all switching post.	4.2 Final Commissioning of Automatic Fault Locator panel units at all switching post
Labour (PLB)	8.84%	10.64%
Electronics (PELEX)	91.16%	86.58%
PVC Insulated Cable (PIC)	-	-
Fibre Cable (POFC)	-	-
All other commodities (POTH)	-	2.78%
Total	100%	100%



17.8.4 (A)

(1) Relevant categories of steel for the purpose of operating Price Variation formula as mentioned in this Clause shall be as under:

SL	Classification	Rates to be used for calculating S _Q or S _B
1.	Reinforcement bars and other rounds	Average of per tonne rates of 10mm dia TMT & 25mm dia TMT; confirming IS1786; Fe 500
2.	All types and sizes of angles, channels and joists	Average of per tonne rates of ‘Angle 75x75x6mm, Mild Steel Plate 10mm thickness and Channel 150x75mm; confirming IS2062, E250 Gr “A”
3.	All types and sizes of plates	Average of per tonne rates of ‘MS Plates 10mm thickness and 25mm thickness; confirming IS2062, E250 Gr “A”
4.	Any other section of steel not covered in the above categories	Average of price for the 3 categories covered under SL 1, 2 & 3 in this table.

(2). Relevant city for referring “JPC (Joint Plant Committee)” rates of steel items (S_Q /S_B) in different Zonal Railways shall be as under :

SL	City	Railway
1.	Delhi	Northern , North Central, North Eastern, North Western
2.	Kolkata	Eastern, East Central, East Coast, Northeast Frontier, South Eastern, Southeast Central
3.	Mumbai	Central, Western, West Central
4.	Chennai	Southern, South Central & South Western

All these rates shall be as per rates provided by JPC.

17.8.4-B

The Contract Price for Works under schedule G1 shall be adjusted for increase or decrease in rates and prices of labour, Materials, fuel and lubricants, equipment, Machinery, Plant and other Materials or inputs in accordance with the principles, procedures and formulae specified below:

- Price adjustment shall be applied on execution of the respective item of work in accordance with Schedule-G1. The 1st Quarter will start from Bid Due date month;
- Adjustment for each item of work shall be made as per classification of those item of work. Classification for item/ work for determining applicable components will be mentioned either in the work order against Schedule G1 or sub schedules of G1.



For Civil Engineering Works

S N	Classification		1A & 2	5A	6A	7	8A	9A	1B, 5B, 6B 8B & 9B	1C, 5C, 6C, 8C & 9C	5D, 6D, 8D & 9D	5E, 6E, 8E & 9E
	Components											
1	Fixed	*	15	15	15	15	15	15	15	15	15	15
2	Labour	Lc	20	30	20	50	20	20	0	0	10	25
3	Steel	Sc	0	0	0	0	0	0	85	0	50	0
4	Cement	Cc	0	15	0	0	0	0	0	85	0	0
5	Plant Machinery & Spares	PMc	30	5	20	15	20	30	0	0	10	30
6	Fuel & Lubricants	Fc	25	5	15	15	20	15	0	0	10	20
7	Other Materials	Mc	10	30	30	5	25	20	0	0	5	10
Total			100	100	100	100	100	100	100	100	100	100

* It shall not be considered for any price variation.

The classification mentioned in the table above represents following type of item(s) in the work(s)–

1 Earthwork in Formation

1A All Item(s) excluding 1B or/and 1C

1B Item(s) for supply of Steel

1C Item(s) for supply of Cement

2 Ballast Supply Works

3 DELETED

4 DELETED

5 Building Works

5A All Item(s) excluding 5B or/and 5C or/and 5D or/and 5E

5B Item(s) for supply of Steel

5C Item(s) for supply of Cement

5D Item(s) for Fabrication & Erection of Structures including supply of Steel



5E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

6 Bridges & Protection work

6A All Item(s) excluding 6B or/and 6C or/and 6D or/and 6E

6B Item(s) for supply of Steel

6C Item(s) for supply of Cement

6D Item(s) for Fabrication, Assembly, Erection & Launching of Girders including supply of Steel

6E Item(s) for Fabrication, Assembly, Erection & Launching of Girders excluding supply of Steel

7 Permanent Way linking Platform,

8 Passenger Amenities

8A All Item(s) excluding 8B or/and 8C or/and 8D or/and 8E

8B Item(s) for supply of Steel item/fittings

8C Item(s) for supply of Cement Item

8D Item(s) for Fabrication & Erection of Structures including supply of Steel

8E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

9 Any Other Works not covered in Classification 1 to 8

9A All Item(s) excluding 9B or/and 9C or/and 9D or/and 9E

9B Item(s) for supply of Steel

9C Item(s) for supply of Cement or/and Grout

9D Item(s) for Fabrication & Erection of Structures including supply of Steel

9E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

Formulae: The Amount of variation in prices in various components (labour, material etc.) shall be worked out by the following formulae:

$$(i) L = \frac{(W \text{ or } WSF \text{ or } WF \text{ or } WSFL \text{ or } WFL) \times (L_Q - L_B) \times L_C}{L_B \times 100}$$

$$(ii) M = \frac{(W \text{ or } WSF \text{ or } WF \text{ or } WSFL \text{ or } WFL) \times (M_Q - M_B) \times M_C}{M_B \times 100}$$

$$(iii) F = \frac{(W \text{ or } WSF \text{ or } WF \text{ or } WSFL \text{ or } WFL) \times (F_Q - F_B) \times F_C}{F_B \times 100}$$

(iv) DELETED



$$\text{PM} = \frac{(W \text{ or } W_S \text{ or } W_F \text{ or } W_{SF} \text{ or } W_{FL}) \times (\text{PMQ} - \text{PMB}) \times \text{PMB} \times 100}{\text{SB} \times 100}$$

$$\text{S} = \frac{(W \text{ or } W_S \text{ or } W_F) \times (\text{SQ} - \text{SB}) \times \text{SC}}{\text{SB} \times 100}$$

$$\text{C} = \frac{(W \text{ or } W_C) \times (\text{CQ} - \text{CB}) \times \text{CC}}{\text{CB} \times 100}$$

Where,

- L Amount of price variation in Labour
- M Amount of price variation in Materials
- F Amount of price variation in Fuel
- PM Amount of price variation in Plant, Machinery and Spares
- S Amount of price variation in Steel Supply Item
- C Amount of price variation in Cement Supply Item
- T Percentage variation payable on the gross value of bill of Concreting (Bill(s) of Quantities for concrete items)
- L_C % of Labour Component in the item(s)
- M_C % of Material Component in the item(s)
- F_C % of Fuel Component in the item(s)
- PM_C % of Plant, Machinery and Spares Component in the item(s)
- S_C % of Steel Supply item Component in the item(s)
- C_C % of Cement Supply item Component in the item(s)
- W Gross value of work done by Contractor under work orders in schedule G1 or sub schedule of G1, as per stage payment certificate excluding the Gross value of work under W_S or/and W_C or/and W_{SF} or/and W_F or/and W_{SFL} or/and W_{FL} and cost of materials supplied by Railway either free or at fixed rate,
- W_S Gross value of work done by Contractor under work orders in schedule G1 or sub schedule of G1, for item(s) of supply of steel.
- W_C Gross value of work done by Contractor Gross value of work done by Contractor under work orders in schedule G1 or sub schedule of G1, for item(s) of supply of cement and /or supply of grout material.
- W_{SF} Gross value of work done by Contractor Gross value of work done by Contractor under work orders in schedule G1 or sub schedule of G1, for item(s) of Fabrication & Erection of Structures including supply of Steel.



- W_F Gross value of work done by Contractor Gross value of work done by Contractor under work orders in schedule G1 or sub schedule of G1, for Fabrication & Erection of Structures excluding supply of Steel.
- W_{SFL} Gross value of work done by Contractor Gross value of work done by Contractor under work orders in schedule G1 or sub schedule of G1, for item(s) of Fabrication, Assembly, Erection/Launching of Girders including supply of Steel.
- W_{FL} Gross value of work done by Contractor Gross value of work done by Contractor under work orders in schedule G1 or sub schedule of G1, for item(s) of Fabrication, Assembly, Erection/Launching of Girders excluding supply of Steel.
- L_B Consumer Price Index for Industrial Workers- All India: Published in R.B.I. Bulletin for the base period
- L_Q Consumer Price Index for Industrial Workers- All India: Published in R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration
- M_B Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the base period
- M_Q Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration
- F_B The average of official prices of Diesel available on the official website of ‘Petroleum Planning and Analysis cell’ under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai & Chennai, for the base period
- F_Q The average of official prices of Diesel available on the official website of ‘Petroleum Planning and Analysis cell’ under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai & Chennai, for the 3 months of the quarter under consideration
- PM_B Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages)for ‘Manufacture of machinery for mining, quarrying and construction’– published in RBI(Reserve Bank of India) Bulletin, for the base period.
- PM_Q Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages)for ‘Manufacture of machinery for mining, quarrying and construction’– published in RBI(Reserve Bank of India) Bulletin, for the average price index of 3 months of the quarter under consideration.



- S_B** The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9; for the base period.
- S_Q** The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9; for the 3 months of the quarter under consideration.
- C_B** Index No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the base period
- C_Q** No. of Wholesale Price Index of sub-group Cement, Lime & Plasters published in RBI Bulletin for the average price index of the 3 months of the quarter under consideration

Note:--

A) The demands for escalation of cost shall be allowed on the basis of provisional indices as mentioned in the formulae in clause 17.8.6 above. Any adjustment needed to be done based on the finally published indices shall be made as and when they become available.

B) Relevant categories of steel for the purpose of operating Price Variation formula as mentioned in this Clause shall be as under:

SL	Classification	Rates to be used for calculating S _Q or S _B
1.	Reinforcement bars and other rounds	Average of per tonne rates of 10mm dia TMT & 25mm dia TMT; confirming IS1786; Fe 500
2.	All types and sizes of angles, channels and joists	Average of per tonne rates of ‘Angle 75x75x6mm, Mild Steel Plate 10mm thickness and Channel 150x75mm; confirming IS2062, E250 Gr “A”
3.	All types and sizes of plates	Average of per tonne rates of ‘MS Plates 10mm thickness and 25mm thickness; confirming IS2062, E250 Gr “A”
4.	Any other section of steel not covered in the above categories	Average of price for the 3 categories covered under SL 1, 2 & 3 in this table.

C) Relevant city for referring “JPC (Joint Plant Committee)” rates of steel items (S_Q /S_B) in different Zonal Railways shall be as under :

SL	City	Railway
1.	Delhi	Northern , North Central, North Eastern, North Western
2.	Kolkata	Eastern, East Central, East Coast, Northeast Frontier, South Eastern, Southeast Central
3.	Mumbai	Central, Western, West Central
4.	Chennai	Southern, South Central & South Western

All these rates shall be as per rates provided by JPC.



17.8.5 In case an IPC relates to a month which is within 3 (three) months from the Base Month, no price adjustment shall be applicable.

17.9 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 there for 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 only until the date of the respective Project Milestone or the Scheduled Completion Date, as the case may be.

17.10 Final Payment Statement

17.10.1 Within 60 (sixty) days of receiving the Completion Certificate under Clause 12.4, the Contractor shall submit to the Authority Engineer six copies of a final payment statement (the “**Final Payment Statement**”), with supporting documents, in the form prescribed by the Authority Engineer:

- (a) the summary of Contractor’s Stage Payment Statements for Works as submitted in accordance with Clause 17.4;
- (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 Engineer disagrees with or cannot verify any part of the Final Payment Statement, the Contractor shall submit such further information as the Authority Engineer may reasonably require. The Authority 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 24; or
- (ii) a Final Payment Certificate in accordance with Clause 17.15, if there are no disputed items.

17.10.2 If the Authority Engineer does not prescribe the form referred to in Clause 17.10.1 within 7 (Seven) days of the date of issue of the Completion Certificate, the Contractor shall submit the statement in such form as it deems fit.

17.11 Discharge

Upon submission of the Final Payment Statement under Clause 17.10, the Contractor shall give to the Authority, with a copy to the Authority 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 17.12.

17.12 Final Payment Certificate

17.12.1 Within 30 (thirty) days after receipt of the Final Payment Statement under Clause 17.10, and the written discharge under Clause 17.11, and there being no disputed items of claim, the Authority 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 Engineer, is finally due under this Agreement or otherwise. For the avoidance of doubt, before issuing the Final Payment Certificate, the Authority Engineer shall ascertain from the Authority all amounts previously paid by the Authority, all sums due to the Authority, and the balance, if any, due from the Authority to the Contractor or from the Contractor to the Authority, as the case may be.

17.12.2 The Authority shall, in accordance with the provisions of Clause 17.7, pay to the Contractor the amount which is specified as being finally due in the Final Payment Certificate.

17.13 Change in law

17.13.1 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 costs, notify the Authority with a copy to the Authority Engineer of such additional costs due to Change in Law.

17.13.2 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 costs, notify the other Party with a copy to the Authority Engineer of such reduction in costs due to Change in Law.

17.13.3 The Authority Engineer shall, within 15 (fifteen) days from the date of receipt of notice from the Contractor or the Authority, as the case may be, determine any addition or reduction to the Contract Price, as the case may be, due to the Change in Law.

17.14 Correction of Interim Payment Certificates

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



17.15 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.

17.16 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 of bonus equivalent to 0.03% (zero point zero three 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 5% (five per cent) 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 doubt, the Parties agree that for the purpose of determining the bonus payable hereunder, the Contract Price shall always be deemed to be the amount specified in Clause 17.1.1, and shall exclude any revision thereof for any reason.



ARTICLE 18

INSURANCE

18.1 Insurance for Works

18.1.1 The Contractor shall effect and maintain at its own cost the insurances specified in Schedule-N and as per the requirements of Applicable Laws.

18.1.2 Subject to the provisions of Clause 19.6, the Contractor shall, in accordance with the provisions of this Agreement, be liable to bear the cost of any loss or damage that does not fall within the scope of this Article 18 or cannot be recovered from the insurers.

18.1.3 Subject to the exceptions specified in Clause 18.1.4 below, the Contractor shall 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;

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.

18.1.4 Notwithstanding anything stated above in Clause 18.1.3, 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 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
- (c) 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 proportionate to the liability of the Authority, its servants or agents or other contractors not associated with the Contractor in such injury or damage.

18.1.5 Without prejudice to the obligations of the parties as specified under Clauses 18.1.3 and 18.1.4, the Contractor shall maintain or effect such third party insurances as may be required under Applicable Laws.



18.1.6 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 cover 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.

18.2 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 18. 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.

18.3 Evidence of Insurance Cover

18.3.1 All insurances obtained by the Contractor in accordance with this Article 18 shall be maintained with insurers on terms consistent with Good Industry Practice. Within 10 (ten) days of obtaining any insurance cover, the Contractor shall furnish to the Authority notarised 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.

18.3.2 The Contractor shall procure and ensure the adequacy of the insurances at all times in accordance with the provisions of this Agreement.

18.4 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. If either the Contractor or the Authority fails to comply with any condition of the insurances effected under the contract, the Party so failing to comply shall indemnify the other Party against all direct losses and claims (including legal fees and expenses) arising from such failure.

18.5 Waiver of subrogation

All insurance policies in respect of the insurance obtained by the Contractor pursuant to this Article 18 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.

18.6 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.

18.7 Cross liabilities

Any such insurance maintained or effected in pursuance of this Article 18 shall include a cross liability clause such that the insurance shall apply to the Contractor and to the Authority as separately insured.

18.8 Accident or injury to workmen

Notwithstanding anything contained 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 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 defaults for which the Authority shall be liable.

18.9 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 Railway Project from and against any liability incurred in pursuance of this Article 18 Provided that for the purposes of this Clause 18.9, the Contractor’s personnel/any person employed by the Contractor shall include the Sub-contractor and its personnel. Provided further that in respect of any persons employed by any Sub-contractor, the Contractor's obligations to insure as aforesaid under this Clause 18.9 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.

18.10 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 Railway Project 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.

18.11 Compliance with policy conditions

The Contractor expressly acknowledges and undertakes to fully indemnify the Authority from and against all losses and claims arising from the Contractor's failure to comply with conditions imposed by the insurance policies effected in accordance with this Agreement.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Part V

Force Majeure and Termination



ARTICLE 19

FORCE MAJEURE

19.1 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 19.2, 19.3 and 19.4 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 (a) is beyond the reasonable control of the Affected Party, and (b) the Affected Party could not have prevented or overcome by exercise of due diligence and following Good Industry Practice, and (c) has Material Adverse Effect on the Affected Party.

19.2 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 Railway Project 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 19.3;
- (c) any failure or delay of a Sub-contractor but only to the extent caused by another Non-Political Event;
- (d) any judgement 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 any 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; or (v) breach of its obligations by the Contractor under its sub-contracts;
- (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.



19.3 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 Railway Project by the Contractor for an aggregate period exceeding 10 (ten) days in an Accounting Year;
- (d) failure of the Authority to permit the Contractor to continue with its Construction Works, with or without modifications, in the event of stoppage of such work after discovery of any geological or archaeological finds;
- (e) any failure or delay of a Sub-contractor to the extent caused by any Indirect Political Event;
- (f) any Indirect Political Event that causes a Non-Political Event; or
- (g) any event or circumstances of a nature analogous to any of the foregoing.

19.4 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 17.13;
- (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 unauthorised or without jurisdiction revocation of, or refusal to renew or grant without valid cause, any clearance, licence, permit, authorisation, 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, licence, authorisation, 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.

19.5 Duty to report Force Majeure Event

19.5.1 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 19 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.

19.5.2 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.

19.5.3 For so long as the Affected Party continues to claim to be 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 19.5.1, and such other information as the other Party may reasonably request the Affected Party to provide.

19.6 Effect of Force Majeure Event on the Agreement

19.6.1 Upon the occurrence of any Force Majeure

- (a) prior to the Appointed Date, both Parties shall bear their respective Force Majeure costs.
- (b) 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:



- (i) 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;
- (ii) 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
- (iii) upon occurrence of a Political Event, all Force Majeure costs attributable to such Political Event shall be reimbursed by the Authority to the Contractor.

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.

- 19.6.2 Save and except as expressly provided in this Article 19, 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.
- 19.6.3 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, as may be determined by the Authority Engineer.
- 19.6.4 Force Majeure costs for any event which results in any offsetting compensation being payable to the Contractor by or on behalf of its sub-contractors shall be reduced by such amounts that are payable to the Contractor by its Sub-contractors.

19.7 Termination Notice for Force Majeure Event

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 19, 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.



19.8 Termination Payment for Force Majeure Event

19.8.1 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 21.5.

19.8.2 If Termination is on account of an Indirect Political Event, the Termination Payment shall include:

- (a) any sums due and payable under Clause 21.5; and
- (b) the reasonable cost, as determined by the Authority Engineer, of the Plant and Materials procured by the Contractor and transferred to the Authority for use in Construction, only if such Plant and Materials are in conformity with the Specifications and Standards;

19.8.3 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 21.6.2 as if it were an Authority Default.

19.9 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.

19.10 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 20

SUSPENSION OF CONTRACTOR’S RIGHTS

20.1 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 (a) suspend carrying out of the Works or any part thereof, and (b) carry out such Works 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.

20.2 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 in the Contractor 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 licences and sub-licences respectively, the Authority or any other person authorised by it under Clause 20.1 to use during Suspension, all Intellectual Property belonging to or licenced to the Contractor with respect to the Railway Project and its design, engineering, construction and maintenance, and which is used or created by the Contractor in performing its obligations under the Agreement.

20.3 Revocation of Suspension

20.3.1 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.

20.3.2 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.

20.4 Termination

20.4.1 At any time during the period of Suspension under this Article 20, 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 21 as if it is a Contractor Default under Clause 21.1.

- 20.4.2 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 21

TERMINATION

21.1 Termination for Contractor Default

21.1.1 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 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) subsequent to 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-I, 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 of the Railway Project 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 for 30 (thirty) days without reflecting the same in the current programme and such stoppage has not been authorised by the Authority Engineer;
- (f) the Project Completion Date does not occur within the period specified in Schedule-I for the Scheduled Completion Date, or any extension thereof;
- (g) failure to complete the Punch List items within the periods stipulated there for in Clause 12.3;
- (h) 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 Engineer;
- (i) the Contractor subcontracts the Works or any part thereof in violation of this Agreement or assigns any part of the Works without the prior approval of the Authority;
- (j) the Contractor creates any Encumbrance in breach of this Agreement;



- (k) an execution levied on any of the assets of the Contractor has caused a Material Adverse Effect ;
- (l) 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;
- (m) 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;
- (n) a resolution for winding up of the Contractor is passed, or any petition for winding up of the Contractor is admitted by a court of competent jurisdiction and a provisional liquidator or receiver 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 a 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;
- (o) any representation or warranty of the Contractor herein contained which is, as of the date hereof, found to be materially false or the Contractor is at any time hereafter found to be in breach thereof;
- (p) 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;
- (q) the Contractor has failed to fulfil any obligation, for which failure Termination has been specified in this Agreement;
- (r) the Contractor has failed to make any payment to the Authority within the period specified in this Agreement; or
- (s) 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.

21.1.2 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.

- 21.1.3 After termination of this Agreement for Contractor Default, the Authority may complete the Works and/or procure its completion through any other entity. The Authority and such entity may, for this purpose, use any Materials, Plant and equipment, Contractor's documents and other design documents made by or on behalf of the Contractor.

21.2 Termination for Authority Default

- 21.2.1 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 and forest clearances required for construction of the Railway Project;
- (d) 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; or
- (e) the Authority Engineer fails to issue the relevant Interim Payment Certificate within 60 (sixty) days after receiving a statement and supporting documents.

- 21.2.2 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.



21.3 Right of Authority to Determine the Contract

Notwithstanding anything hereinabove, the Authority shall be entitled to determine and terminate the contract at any time should, in the Authority's opinion, the cessation of work becomes necessary owing to paucity of funds or from any other cause whatever, in which case it shall be treated as Authority Default and Termination Payment shall be made as per clause 21.6 below. Notice in writing from the Authority of such determination and the reasons there for shall be conclusive evidence thereof. The termination shall take effect 30 (thirty) days from the date of notice hereunder.

21.4 Requirements after Termination

Upon Termination of this Agreement in accordance with the provisions of this Article 21, the Contractor shall comply with and conform to the following:

- (a) deliver to the Authority all Plant and Materials which shall have become the property of the Authority under this Article 21;
- (b) deliver all relevant records, reports, Intellectual Property and other licences pertaining to the Works, other design documents and in case of Termination occurring after the Provisional Certificate has been issued, the “**as built**” Drawings for the Works;
- (c) transfer and/or deliver all Applicable Permits to the Authority to the extent permissible under Applicable Laws; and
- (d) vacate the Site within 15 (fifteen) days.

21.5 Valuation of Unpaid Works

21.5.1 Within a period of 45 (forty-five) days after Termination under Clause 21.1, 21.2 or 21.3, as the case may be, has taken effect, the Authority Engineer shall proceed in accordance with Clause 16.5 to determine as follows the valuation of unpaid Works (the “**Valuation of Unpaid Works**”):

- (a) value of the completed stage of the Works under schedule G or *and* as per actual execution of items as specified for works under schedule G1, less payments already made; and
- (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 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.

21.5.2 The Valuation of Unpaid Works shall be communicated to the Authority, with a copy to the Contractor, within a period of 45 (forty five) days from the date of Termination.



21.6 Termination Payment

21.6.1 Upon Termination on account of Contractor Default under Clause 21.1, the Authority shall:

- (a) encash and appropriate the Performance Security and Retention Money and in the event the Contractor has failed to replenish or extend the Performance Security, claim the amount stipulated in Clause 7.1.1, as agreed pre-determined compensation to the Authority for any losses, delays and cost of completing the Works, if any;
- (b) encash and appropriate the bank guarantee, if any, to the extent 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, and all taxes due to be deducted at source.

21.6.2 Upon Termination on account of an Authority Default under Clause 21.2 or under Clause 21.3, the Authority shall:

- (a) return the Performance Security and Retention Money forthwith;
- (b) encash and appropriate the bank guarantee, if any, to the extent of the outstanding Advance Payment, including interest thereon; and
- (c) pay to the Contractor, by way of Termination Payment, an amount equal to:
 - (i) Valuation of Unpaid Works;
 - (ii) the reasonable cost, as determined by the Authority Engineer, of the Plant and Materials procured by the Contractor and transferred to the Authority for its use, only if such Plant and Materials are in conformity with the Specifications and Standards;
 - (iii) the reasonable cost of temporary works, as determined by the Authority Engineer; 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.

21.6.3 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, after the Valuation of Unpaid Works has been communicated by the Authority Engineer, and in the event of any delay, the Authority shall pay interest at the Bank Rate plus 3% (three percent), calculated at quarterly rests, 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.



21.6.4 The Contractor expressly agrees that Termination Payment under this Article 21 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.

21.7 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 Railway Project shall, as between the Contractor and the Authority, vest in the Authority in whole, free from any and all Encumbrances; provided that the foregoing shall be without prejudice to Clause 21.6;
- (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 except for taking possession of materials, stores, implements, construction plants and equipment of the Contractor, which have not been vested in the Authority in accordance with the provisions of this Agreement.

21.8 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.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Part VI

Other Provisions



ARTICLE 22

ASSIGNMENT AND CHARGES

22.1 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.

22.2 Hypothecation of Materials or Plant

Notwithstanding the provisions of Clause 22.1, 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. For the avoidance of doubt, all Materials and Plants shall, upon their incorporation into Works, be free from any and all Encumbrances without the Authority being required to make any payment to any person on account of any costs, compensation, expenses and charges for such Materials, Plants and Works.



ARTICLE 23

LIABILITY AND INDEMNITY

23.1 General indemnity

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.

23.2 Indemnity by the Contractor

23.2.1 Without limiting the generality of Clause 23.1, 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 as a result 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.

23.2.2 Without limiting the generality of the provisions of this Article 23, 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 Railway Project, 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 licence, at no cost to the Authority, authorising continued use of the infringing work. If the Contractor is unable to secure such licence 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.

23.3 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 Agreement (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. In the event that 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.

23.4 Defence of claims

23.4.1 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 Agreement, the Indemnifying Party shall be entitled, at its option, to assume and control the defence 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 defence. 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.

23.4.2 If the Indemnifying Party has exercised its rights under Clause 23.3, 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).

23.4.3 If the Indemnifying Party exercises its rights under Clause 23.3, 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 defence 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 defence 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 defences 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 23.4.3 shall be applicable, the counsel for the Indemnified Party shall have the right to direct the defence 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.

23.5 No consequential claims

Notwithstanding anything to the contrary contained in this Article 23, the indemnities herein provided shall not include any claim or recovery in respect of any cost, expense, loss or damage of an indirect, incidental or consequential nature, including loss of profit, except as expressly provided in this Agreement.

23.6 Survival on Termination

The provisions of this Article 23 shall survive Termination.



ARTICLE 24

DISPUTE RESOLUTION

24.1 Conciliation of Disputes

- 24.1.1 All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract, shall be referred by the Contractor to the "Authority" through “Notice of Dispute” provided that no such notice shall be served later than 30 days after the date of issue of Completion Certificate by the Authority Engineer. Authority shall, within 30 days after receipt of the Contractor’s “Notice of Dispute”, notify the name of conciliator(s) to the Contractor. In case Authority fails to fix Conciliator within 30 days, Contractor shall be free to approach Dispute Adjudication Board (DAB) for adjudication of Dispute.
- 24.1.2 The Conciliator(s) shall assist the parties to reach an amicable settlement in an independent and impartial manner within the terms of contract. If the parties reach agreement on a settlement of the dispute, they shall draw up and sign a written settlement agreement duly signed by Authority Engineer, Contractor and conciliator(s). When the settlement agreement is signed, it shall be final and binding on the parties. The conciliators shall be paid fee as fixed by Ministry of Railways time to time, which shall be shared equally by the parties.
- 24.1.3 The parties shall not initiate, during the conciliation proceedings, any reference to DAB or arbitral or judicial proceedings in respect of a dispute that is the subject matter of the conciliation proceedings.
- 24.1.4 The conciliation shall be carried out as per ‘The Arbitration and Conciliation Act, 1996’ and the proceedings may be terminated as per Section 76 of the above Act.

24.2 Dispute Adjudication Board (DAB)

- 24.2.1 A dispute/s if not settled through conciliation, shall be referred to DAB. The DAB shall consist of a panel of three Retired Railway Officers not below senior administrative grade (SAG). The DAB shall be formed within 90 days of signing of Contract Agreement. For this purpose, the Authority will maintain a panel of DAB members. The complete panel, which shall not be less than five members, shall be sent by Authority to the Contractor to nominate one member of the DAB from the panel as Contractor’s nominee within two weeks of receipt of the panel. On receipt of Contractor’s nominee, the Authority shall nominate one member from the same panel as Authority’s nominee for the DAB. Both above nominees shall jointly select presiding member of the DAB from the same panel.



- 24.2.2 The appointment of DAB shall be effectuated by way of a tri-partite agreement among the Authority, Contractor and the respective DAB members. The terms of the remuneration of each member shall be as fixed by Ministry of Railways from time to time. Each party shall be responsible for paying one-half of this remuneration.
- 24.2.3 If one or more of the members appointed refuses to act as DAB member, or is unable or unwilling to perform his functions as DAB member for any reason whatsoever or dies or in the opinion of the Authority fails to act without undue delay, the parties shall terminate the mandate of such DAB member and thereupon new DAB member shall be appointed in the same manner, as the outgoing DAB member had been appointed.
- 24.2.4 The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Authority or the Contractor acting alone. Unless otherwise agreed by both the Parties, the appointment of the DAB (including each member) shall expire upon expiry of this Contract Agreement.
- 24.2.5 Before start of DAB proceedings, each DAB member shall give the following certificate to the Authority and the Contractor:
- “I have no any past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind. Further, I have no any past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality.”*
- 24.2.6 DAB proceedings shall be conducted as decided by the DAB. The DAB shall give its decision within 90 days of a Dispute referred to it by any of the Parties, duly recording the reasons before arriving at the decision. The DAB shall decide the issue within terms and conditions of the contract. This time limit shall be extendable subject to the Parties mutual agreement.
- 24.2.7 The DAB decision shall not be binding on both the Parties. In case any party is not satisfied by the decision of DAB, then the aggrieved party may approach Standing Arbitral Tribunal for arbitration proceedings. However, even if the aggrieved party had proceeded for Arbitration as per provisions of this agreement, 75% of award amount, pending adjudication by Standing Arbitral Tribunal/Court of Law, shall be made by party to other party. In case payment is to be made by Authority to Contractor, the terms & conditions as incorporated in the Ministry of Railways letter No. 2016/CE(I)/CT/ARB/3(NITI Aayog)/Pt. dated 08th Mar,2017 as amended time to time shall be followed. However, in case Contractor has to pay to the Authority, then 75% of the award amount shall be deducted by the Authority from the running bills or other dues of the Contractor, pending adjudication by Standing Arbitral Tribunal/Court of Law.
- 24.2.8 No dispute shall be referred to Standing Arbitral Tribunal unless the same has been referred to DAB for adjudication. However, in case DAB is not formed due to any reason, the disputes can be directly referred to Standing Arbitral Tribunal to adjudicate the dispute.



- 24.2.9 In the specific cases of any misconduct by any of the members of the DAB, the parties shall have the right to specifically bring it to the notice of the DAB such conduct, through a statement filed with necessary documents in proof of such misconduct and the DAB, after taking NOTICE of such conduct initiate the replacement of the member concerned, in the same manner the member to be replaced was appointed.
- 24.2.10 Once the decision is given by DAB, DAB cannot review the decision at its own or on the request of one party, unless both parties agree for review of decision by DAB.
- 24.2.11 In case DAB decision is not challenged by either party within 180 days of receipt of decision of DAB, the decision shall be considered as final and parties would be barred for referring the same to Standing Arbitral Tribunal for adjudication.
- 24.2.12 The obligation of the Authority and the Contactor shall not be altered by reasons of issue being or under reference to DAB.
- 24.2.13 The DAB shall conduct the proceedings at Gorakhpur or any other convenient venue which shall be decided by DAB in consultations with parties.
- 24.2.14 It is a term of this contract that the Parties shall not approach any Court of Law for settlement of such disputes or differences unless an attempt has first been made by the parties to settle such disputes or differences through DAB and Standing Arbitral Tribunal.

24.3 Standing Arbitral Tribunal

- 24.3.1 The arbitration proceedings shall be conducted as per ‘The Arbitration and Conciliation Act, 1996’. The Arbitral Tribunal shall consist of a panel of three Retired Railway Officers not below senior administrative grade (SAG). The Standing Arbitral Tribunal shall be formed within 90 days of signing of Contract document. For this purpose, the Authority shall maintain a panel of arbitrators. The complete panel, which shall not be less than five members, shall be sent by Authority to the Contractor to nominate one arbitrator from the panel as Contractor’s nominee within two weeks of receipt of the panel. On receipt of Contractor’s nominee, the Authority shall appoint above contractor’s nominee as well as another from the same panel as Authority’s nominee as arbitrators. Both above arbitrators shall jointly select presiding arbitrator from the same panel.
- 24.3.2 If the Contractor fails to select the contractor’s nominee from the panel within two weeks of the receipt of the said panel, the Authority shall, after giving one more opportunity to contractor to nominate one as contractor’s nominee within next two weeks, appoint two arbitrators from the same panel. Both above arbitrators shall jointly select presiding arbitrator from the same panel.
- 24.3.3 If one or more of the Arbitrators appointed refuses to act as Arbitrator, withdraws from his office as Arbitrator, or vacates his office or is unable or



unwilling to perform his functions as Arbitrator for any reason whatsoever or dies or in the opinion of the Authority fails to act without undue delay, the parties shall terminate the mandate of such arbitrator and thereupon new arbitrator shall be appointed in the same manner, as the outgoing arbitrator had been appointed.

- 24.3.4 Before start of arbitration proceedings, each appointed arbitrator shall give the following certificate to the Authority and the Contractor:

"I have no any past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind. Further, I have no any past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality in terms of The Arbitration and Conciliation Act, 1996."

- 24.3.5 In the specific cases of any misconduct by any of the members of the TRIBUNAL, the parties shall have the right to specifically bring it to the notice of the TRIBUNAL such conduct, through a statement filed with necessary documents in proof of such misconduct and the TRIBUNAL, after taking NOTICE of such conduct initiate the replacement of the member concerned, in the same manner the member to be replaced was appointed.
- 24.3.6 Each party has to prepare and furnish to Standing Arbitral Tribunal and other party, once in a every six months, an account giving full and detailed particulars of all claims, which even after decision of DAB are unsettled, to which the parties may consider themselves entitled to during the last preceding six months. If any dispute has arisen as regards execution of the works under the contract, while submitting the said half yearly claims, the parties shall give full particulars of such dispute in the said submission. After signing Contract agreement, within 6 months, the parties shall submit all the claims from date of award of contract in first submission of claims.
- 24.3.7 The said communication will be the reference of the dispute to the ARBITRAL TRIBUNAL appointed under the present agreement.
- 24.3.8 The parties shall submit all the relevant documents in support of their claims and the reasons for raising the dispute to the TRIBUNAL.
- 24.3.9 The said claims of the parties so referred to ARBITRAL TRIBUNAL so far it relates to the disputed claims, shall be treated as Statement of Claims of the parties and the ARBITRAL TRIBUNAL shall call upon the other party to submit its reply. The ARBITRAL TRIBUNAL after giving an opportunity of being heard to both the parties, decide the dispute within a period of Four months from the date of communication of the dispute under clause 24.3.6 above. The Arbitral Tribunal will pass a reasoned award in writing, while deciding the Dispute. Once the award is declared, the Arbitral Tribunal cannot review the same except what is permissible in terms of provisions contained in Arbitration and Conciliation Act. The parties shall be entitled to the remedies under the Arbitration and Conciliation Act 1996 or any amendment thereof.



- 24.3.10 The parties agree that all the claims of any nature whatsoever, which the parties may have in respect of the work of the preceding six months, should be made in the said Statements of half yearly claims. If the parties do not raise the claim, if any, arising from the work done in the preceding six months in the statement of half yearly claim, to Standing Arbitral Tribunal, the parties shall be deemed to have waived and given up the claims. The ARBITRAL TRIBUNAL shall not entertain such disputes, which have not been raised in the statement of half yearly Claim before the Standing Arbitral Tribunal and such claims will stand excluded from the scope of arbitration and beyond the terms of reference to the ARBITRAL TRIBUNAL.
- 24.3.11 The parties agree that where the Arbitral award is for payment of money, no interest shall be payable on the whole or any part of the money for any period till the date on which the award is made.
- 24.3.12 The obligation of the Authority and the Contactor shall not be altered by reasons of arbitration being conducted during the progress of work. Neither party shall be suspended the work on account of arbitration and payments to the contractor shall continue to be made in terms of the contract and /or as awarded (except when Award is challenged in the Court in which case the payments would be as per the court's orders)
- 24.3.13 The ARBITRAL TRIBUNAL shall remain in force during the entire period the PRINCIPAL CONTRACT is in force and until the closure of the PRINCIPAL CONTRACT with the final no claim certificate, which will be filed with ARBITRAL TRIBUNAL.
- 24.3.14 The Arbitral Tribunal shall conduct the Arbitration proceedings at Gorakhpur or any other convenient venue which shall be decided by Tribunal in consultation with both parties.
- 24.3.15 The cost of arbitration shall be borne equally by the respective parties. The cost shall inter-alia include fee of the arbitrators as per the rates fixed by the Indian Railways from time to time.
- 24.3.16 It is a term of this contract that the Contractor shall not approach any Court of Law for settlement of such disputes or differences unless an attempt has first been made by the parties to settle such disputes or differences through conciliation, DAB and Standing Arbitral Tribunal.
- 24.3.17 Even in case arbitration award is challenged by a party in the Court of Law, 75% of award amount, pending adjudication by Court of Law, shall be made by party to other party. In case payment is to be made by Authority to Contractor, the terms & conditions as incorporated in the Ministry of Railways letter No. 2016/CE(I)/CT/ARB/3(NITI Aayog)/Pt. dated 08th Mar,2017 as amended time to time shall be followed. However, in case Contractor has to pay to the Authority, then 75% of the award amount shall be deducted by the Authority from the running bills or other dues of the Contractor, pending adjudication by Court of Law.
- 24.3.18 The contract shall be governed by the law for the time being in force in the Republic of India. In case of any disputes/differences resulting in court



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

cases between Contractor & Authority, the jurisdiction shall be of Courts at Gorakhpur only.



ARTICLE 25

MISCELLANEOUS

25.1 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 Gorakhpur shall have exclusive jurisdiction over matters arising out of or relating to this Agreement.

25.2 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).

25.3 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 Bank Rate plus 3% (three percent), save and except as otherwise specified in this Agreement. All interest payment under this Agreement shall, save and except as otherwise specified, be calculated at quarterly rests, and recovery thereof shall be without prejudice to the rights of the Parties under this Agreement including Termination thereof.



25.4 Waiver

25.4.1 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 authorised representative of the Party; and
- (c) shall not affect the validity or enforceability of this Agreement in any manner.

25.4.2 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 thereunder 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.

25.5 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 Engineer of any Document or Drawing submitted by the Contractor nor any observation or inspection of the construction of the Railway Project 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, 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.

25.6 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.



25.7 Survival

25.7.1 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.

25.7.2 All obligations surviving Termination shall only survive for a period of 3 (three) years following the date of such Termination.

25.8 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 Proposal and bid submissions, as the case may be, shall be deemed to form part of this Agreement and treated as such.

25.9 Severability

If for any reason whatsoever, 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.

25.10 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.

25.11 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.

25.12 Successors and assigns

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

25.13 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 Gorakhpur 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 Head 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 Gorakhpur, 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.



25.14 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.

25.15 Counterparts

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

25.16 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 consent of the Authority.

25.17 Copyright and Intellectual Property rights

25.17.1 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 licence to copy, use and communicate the Contractor’s Documents, including making and using modifications of them. This licence 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:

25.17.2 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 25.17.

25.17.3 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.

25.18 Limitation of Liability

25.18.1 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.

25.18.2 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 21 and 23, 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.



ARTICLE 26

DEFINITIONS

26.1 Definitions

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 as set forth in Clause 17.2.1;

“**Affected Party**” shall have the meaning as set forth in Clause 19.1;

“**Affiliate**” means, in relation to either Party {and/or Members}, 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 contract or otherwise);

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

“**Applicable Laws**” means all laws, brought into force and effect by GOI or the State Government(s) 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, licences, permits, authorisations, no objection certificates, consents, approvals and exemptions required to be obtained or maintained under Applicable Laws in connection with the construction of the Railway Project during the subsistence of this Agreement;

“**Appointed Date**” means that date which is later of:

- (a) the 15th day from the date of signing of this Agreement,
- (b) the 30th day from the date on which the Contractor has delivered the Performance Security in accordance with the provisions of Article 7;
- (c) the date on which the Authority has provided the Right of Way and



environmental and forest clearances of at least 95% (ninety five per cent) of the core land length and 90% (ninety percent) of the non-core land length of the Railway Project in conformity with the provisions of Clause 4.3 and 8.2;

“Arbitration Act” means the Arbitration and Conciliation Act, 1996 and shall include modifications to or any re-enactment thereof, as in force from time to time;

“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 as set forth in Clause 21.2;

“Authority Engineer” shall have the meaning as set forth in Clause 16.1;

“Authority Representative” means such person or persons as may be authorised 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 fulfil any obligations of the Authority under this Agreement;

“Bank” means a Nationalised bank incorporated in India when a Bank Guarantee for Advance Payment (Clause 17.2) is to be submitted and a Scheduled Commercial Bank incorporated in India for all other purposes, or any other bank acceptable to the Authority;

“Bank Rate” means the rate of interest specified by the Reserve Bank of India from time to time in pursuance of section 49 of the Reserve Bank of India Act, 1934 or any replacement of such Bank Rate for the time being in effect;

“Base Month” means the month just prior to Bid Due Date month. The Quarter for applicability of price adjustment shall be commence from next month after Base Month;

“Bid” means the documents in their entirety comprised in the bid submitted by the selected bidder/Consortium 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 Month:

- (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 entered into effect until the Base Month;



- (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 Month; or
- (e) any change in the rates of any of the Taxes or royalties that have a direct effect on the Project;

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

“**Change of Scope Notice**” shall have the meaning as set forth in Clause 13.2.1;

“**Change of Scope Order**” shall have the meaning as set forth in Clause 13.2.4;

“**Completion Certificate**” shall have the meaning as set forth in Clause 12.4;

{“**Consortium/Joint Venture**” means the Consortium/Joint Venture of entities which have formed a consortium/joint venture for implementation of this Project;}[§]

“**Construction**” shall have the meaning as set forth in Clause 1.2.1 (f);

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

“**Contract Price**” means the amount as specified in Clause 17.1.1;

“**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 as set forth in Clause 21.1;

“**Core Land**” means the part of Land essentially needed to open & operationalize the mainline for traffic including the Land required for laying the mainline tracks and its Signalling/ Telecom/ Overhead Electrification/ Power Supply Installations, Operational Buildings(station building, huts, gumties etc), as shown in item No. 3(a) of Annexure-I of Schedule-A;

“**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;

[§] This definition may be omitted if the Contractor is not a Consortium/Joint Venture.



- (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 by the Contractor requires any reasonable action by the Contractor that must be approved by the Authority or the Authority Engineer hereunder, the applicable Cure Period shall be extended by the period taken by the Authority or the Authority Engineer to accord their approval;

“**Damages**” shall have the meaning as set forth in paragraph (w) of Clause 1.2.1;

“**Defect**” means any defect or deficiency in Construction of the Works or any part thereof, which does not conform with the Specifications and Standards;

“**Defects Liability Period**” shall have the meaning as set forth in Clause 15.1;

“**Dispute**” shall have the meaning as set forth in Clause 24.1.1;

“**Dispute Resolution Procedure**” means the procedure for resolution of Disputes as set forth in Article 24;

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

“**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 Railway Project, including Users thereof, or which poses an immediate threat of material damage to the Works or any of the Project Assets;

“**Encumbrances**” means, in relation to the Railway Project, 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 payees or beneficiaries or any similar arrangement under any insurance policy pertaining to the Railway Project, 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 as set forth in Clause 17.12.1;

“**Final Payment Statement**” shall have the meaning as set forth in Clause 17.10.1;

“**Force Majeure**” or “**Force Majeure Event**” shall have the meaning ascribed to it in Clause 19.1;



“GAD” or “General Arrangement Drawings” shall have the meaning as set forth in Clause 4.1.3 (c);

“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 Railway Project or the performance of all or any of the services or obligations of the Contractor under or pursuant to this Agreement;

“IEEMA” means Indian Electrical and Electronics Manufacturers Association

“Important Bridge” means a bridge having a linear waterway of 300 metres or a total water way of 1000 sqm or more;

“Indemnified Party” means the Party entitled to the benefit of an indemnity pursuant to Article 23 ;

“Indemnifying Party” means the Party obligated to indemnify the other Party pursuant to Article 23;

“Indirect Political Event” shall have the meaning as set forth in Clause 19.3;

“Insurance Cover” means the aggregate of the maximum sums insured under the insurances taken out by the Contractor pursuant to Article 18, and includes all insurances required to be taken out by the Contractor under Clauses 18.1 and 18.9 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), database rights, semi-conductor, 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 Engineer for payment to the Contractor in respect of



Contractor’s claims for payment raised in accordance with the provisions of this Agreement;

{“**Lead Member**” shall, in the case of a Consortium/Joint Venture, mean the member of such Consortium/Joint Venture who shall have the authority to bind the contractor and each member of the Consortium/Joint Venture; and shall be deemed to be the Contractor for the purposes of this Agreement;}^{\$}

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

“**Maintenance Manual**” shall have the meaning ascribed to it in Clause 10.6;

“**Major Bridge**” means a bridge having a linear waterway of 18 metres or more or which has a clear opening of 12 metres or more in spans;

“**Manuals**” shall mean the manuals specified in Schedule-D;

“**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**” are all the supplies used by the Contractor for incorporation in the Works or for the maintenance of the Railway Project;

“**Minor Bridge**” means a bridge having a linear waterway of less than 18 metres or which has a clear opening of less than 12 metres or in spans;

“**Non-Core Land**” means the Land required for the project line other than the Core-Land, as shown in item No. 3(b) of Annexure-I of Schedule-A;

“**Non-Political Event**” shall have the meaning as set forth in Clause 19.2;

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

“**Performance Security**” shall have the meaning as set forth in Clause 7.1;

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

“**Political Event**” shall have the meaning as set forth in Clause 19.4;

“**Power Block**” means the length of the railway line between two railway stations, on which the overhead equipment (OHE) is de-energised and earthed to enable the Contractor to execute construction or maintenance works;

^{\$} This definition may be omitted if the Contractor is not a Consortium/Joint Venture.



“**Programme**” shall have the meaning as set forth in Clause 10.1.3;

“**Project**” means the construction and maintenance of the Railway Project 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, kilometre-stones, electrical systems, communication systems, rest areas, relief centres, maintenance depots and administrative offices]; and (b) Project Facilities situated on the Site;

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

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

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

“**Project Milestone**” means the project milestone set forth in Schedule-I and includes the Scheduled Completion Date;

“**Proof Consultant**” shall have the meaning as set forth in Clause 10.2.2;

“**Provisional Certificate**” shall have the meaning as set forth in Clause 12.2;

“**Punch List**” shall have the meaning as set forth in Clause 12.2.1;

“**Quality Assurance Plan**” or “**QAP**” shall have the meaning as set forth in Clause 11.2.1;

“**Railway Project**” means the Works specified in this Agreement on the railway line from *** to *** having a length of *** kms in *** Zone;

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

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

“**Retention Money**” shall have the meaning set forth in Clause 7.5.1;

“**Right of Way**” means the constructive possession of the Site free from encroachments and encumbrances, together with all way leaves, easements, unrestricted access and other rights of way, howsoever described, necessary for construction of the Railway Project in accordance with this Agreement;

“**RINL**” means Rashtriya Ispat Nigam Limited



“**Safety Consultant**” shall have the meaning as set forth in clause 10.2.11

“**Scheduled Completion Date**” shall be the date as set forth in Clause 10.3.1;

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

“**Section**” means the portion of the railway line between two block stations;

“**Site**” shall have the meaning as 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 Railway Project, as set forth in Schedule-D, and any modifications thereof, or additions thereto, as included in the design and engineering for the Railway Project submitted by the Contractor to, and expressly approved by, the Authority;

“**Stage Payment Statement**” shall have the meaning as set forth in Clause 17.4;

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

“**Sub-contractor**” means any person or persons to whom a part of the Works 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 as set forth in Article 20;

“**Taxes**” means any Indian taxes including excise duties, customs duties, value added tax, sales tax, local taxes, 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 Railway Project 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 21;

“**Terms of Reference**” or “**TOR**” shall have the meaning as set forth in Clause 16.2.1;

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

“**Time Extension**” shall have the meaning as set forth in Clause 10.4.1;



“**Traffic Block**” means the length of railway line between two railway stations, on which traffic is blocked with or without OHE being de-energised to enable construction or maintenance works to be undertaken.

“**User**” means a person who travels or intends to travel on the Railway Project or any part thereof on any train or vehicle;

“**Valuation of Unpaid works**” shall have the meaning as set forth in Clause 21.5.1;

“**Works**” means all works including survey and investigation, design, engineering, procurement, construction, Plant, Materials, temporary works and other things necessary to complete the Railway Project 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.

IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DAY, MONTH AND YEAR FIRST ABOVE WRITTEN.

SIGNED, SEALED AND
DELIVERED

For and on behalf of

[...***, *** Railway] by:

(Signature)

(Name)

(Designation)

In the presence of:

- 1.
- 2.

SIGNED, SEALED AND
DELIVERED

For and on behalf of

THE CONTRACTOR by:

(Signature)

(Name)

(Designation)

{COUNTERSIGNED and accepted by:

Name and particulars of other members of the Consortium/Joint Venture}



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Schedules



SCHEDULE - A
(See Clauses 2.1 and 8.1)
SITE OF THE PROJECT

1 The Site

- 1.1 Site of the Railway Project shall include the land, buildings, structures and track works as described in Annex-I of this Schedule-A.
- 1.2 The dates of handing over Right of Way to the Contractor are specified in Annex-II of this Schedule-A.
- 1.3 An inventory of the Site including the land, buildings, structures, track works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority's Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of this Agreement.
- 1.4 The alignment plans of the Railway Project are specified in Annex-III.
- 1.5 The status of the environment clearances and forest clearances obtained or awaited is given in Annex IV.



Annex - I
(Schedule-A)

EXISTING DETAILS OF PANIAHWA – MADHUBANI SECTION

1. Site

The Site of the Railway Project comprises the section commencing from km 0+350 to km 29+400 i.e. the Paniahwa (Excluding) – Madhubani (Including) New (Broad Gauge) Railway Line project in the State of Uttar Pradesh and Bihar in the North Eastern Railway Zone. The land and other structures comprising the site are described below:

2. Route Length

The route length of the Railway Project comprises the section as described below:

S. No.	Name of location From	Name of location To	Start Chainage (km)	End Chainage (km)	Length (km)	Remarks
1	Paniahwa (Excluding)	Madhubani (Including)	0+350 (0.350)	29+400 (29.400)	29.050	Paniahwa Yard excluded and other three yards i.e. Chhitauni, Jataha & Madhubani are included)

3. Land

Right of way will comprise of adequate land width on which a new line is to be built as per conceptual/approved alignment plan enclosed with the tender document. Width of Right of Way will be for section outside yard limits up to railway boundary; for station yard limits, it is up to railway boundary or 5m beyond extremities of proposed works to be executed such as yard line, toe line of formation/OHE foundation/platform toe line, in yards as per conceptual/approved ESPs enclosed with tender document, whichever is lower. In case of dispute, the Authority Engineer’s decision will be the final.

a. Core Land

The Site of the Railway Project comprises the land described below:



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
1	Paniahwa - Chhitauni	350.000	400.000	50.000	Railway Land	Railway Land
2	Paniahwa - Chhitauni	400.000	500.000	100.000	Railway Land	Railway Land
3	Paniahwa - Chhitauni	500.000	600.000	100.000	Railway Land	Railway Land
4	Paniahwa - Chhitauni	600.000	700.000	100.000	Railway Land	Railway Land
5	Paniahwa - Chhitauni	700.000	800.000	100.000	45.000	75.000
6	Paniahwa - Chhitauni	800.000	900.000	100.000	45.000	75.000
7	Paniahwa - Chhitauni	900.000	1000.000	100.000	45.000	75.000
8	Paniahwa - Chhitauni	1000.000	1100.000	100.000	45.000	75.000
9	Paniahwa - Chhitauni	1100.000	1200.000	100.000	45.000	75.000
10	Paniahwa - Chhitauni	1200.000	1300.000	100.000	45.000	75.000
11	Paniahwa - Chhitauni	1300.000	1400.000	100.000	45.000	75.000
12	Paniahwa - Chhitauni	1400.000	1500.000	100.000	45.000	75.000
13	Paniahwa - Chhitauni	1500.000	1600.000	100.000	45.000	75.000
14	Paniahwa - Chhitauni	1600.000	1700.000	100.000	45.000	75.000
15	Paniahwa - Chhitauni	1700.000	1800.000	100.000	45.000	75.000
16	Paniahwa - Chhitauni	1800.000	1900.000	100.000	45.000	75.000
17	Paniahwa - Chhitauni	1900.000	2000.000	100.000	45.000	75.000
18	Paniahwa - Chhitauni	2000.000	2100.000	100.000	45.000	75.000
19	Paniahwa - Chhitauni	2100.000	2200.000	100.000	45.000	75.000
20	Paniahwa - Chhitauni	2200.000	2300.000	100.000	45.000	75.000
21	Paniahwa - Chhitauni	2300.000	2400.000	100.000	45.000	75.000
22	Paniahwa - Chhitauni	2400.000	2467.000	67.000	45.000	75.000
23	Paniahwa - Chhitauni	2467.000	2500.000	33.000	45.000	75.000
24	Paniahwa - Chhitauni	2500.000	2600.000	100.000	45.000	75.000
25	Paniahwa - Chhitauni	2600.000	2635.000	35.000	45.000	75.000
26	Chhitauni Yard	2635.000	2700.000	65.000	45.000	75.000
27	Chhitauni Yard	2700.000	2800.000	100.000	45.000	75.000
28	Chhitauni Yard	2800.000	2900.000	100.000	45.000	75.000
29	Chhitauni Yard	2900.000	3000.000	100.000	45.000	75.000
30	Chhitauni Yard	3000.000	3100.000	100.000	45.000	75.000
31	Chhitauni Yard	3100.000	3200.000	100.000	45.000	75.000
32	Chhitauni Yard	3200.000	3300.000	100.000	45.000	75.000
33	Chhitauni Yard	3300.000	3400.000	100.000	45.000	75.000
34	Chhitauni Yard	3400.000	3500.000	100.000	45.000	75.000
35	Chhitauni Yard	3500.000	3600.000	100.000	45.000	75.000
36	Chhitauni Yard	3600.000	3650.000	50.000	45.000	75.000
37	Chhitauni - Jataha	3650.000	3700.000	50.000	40.000	42.000
38	Chhitauni - Jataha	3700.000	3800.000	100.000	40.000	42.000
39	Chhitauni - Jataha	3800.000	3900.000	100.000	40.000	42.000
40	Chhitauni - Jataha	3900.000	4000.000	100.000	40.000	42.000
41	Chhitauni - Jataha	4000.000	4150.000	150.000	40.000	42.000
42	Chhitauni - Jataha	4150.000	4200.000	50.000	20.000	20.000
43	Chhitauni - Jataha	4200.000	4300.000	100.000	20.000	20.000
44	Chhitauni - Jataha	4300.000	4400.000	100.000	20.000	20.000
45	Chhitauni - Jataha	4400.000	4500.000	100.000	20.000	20.000
46	Chhitauni - Jataha	4500.000	4600.000	100.000	20.000	20.000
47	Chhitauni - Jataha	4600.000	4700.000	100.000	20.000	20.000
48	Chhitauni - Jataha	4700.000	4800.000	100.000	20.000	20.000
49	Chhitauni - Jataha	4800.000	4900.000	100.000	20.000	20.000
50	Chhitauni - Jataha	4900.000	5000.000	100.000	20.000	20.000
51	Chhitauni - Jataha	5000.000	5100.000	100.000	20.000	20.000
52	Chhitauni - Jataha	5100.000	5200.000	100.000	20.000	20.000
53	Chhitauni - Jataha	5200.000	5300.000	100.000	20.000	20.000
54	Chhitauni - Jataha	5300.000	5400.000	100.000	20.000	20.000



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
55	Chhitauni - Jataha	5400.000	5500.000	100.000	20.000	20.000
56	Chhitauni - Jataha	5500.000	5600.000	100.000	20.000	20.000
57	Chhitauni - Jataha	5600.000	5700.000	100.000	20.000	20.000
58	Chhitauni - Jataha	5700.000	5800.000	100.000	20.000	20.000
59	Chhitauni - Jataha	5800.000	5900.000	100.000	20.000	20.000
60	Chhitauni - Jataha	5900.000	6000.000	100.000	20.000	20.000
61	Chhitauni - Jataha	6000.000	6100.000	100.000	20.000	20.000
62	Chhitauni - Jataha	6100.000	6200.000	100.000	20.000	20.000
63	Chhitauni - Jataha	6200.000	6300.000	100.000	20.000	20.000
64	Chhitauni - Jataha	6300.000	6400.000	100.000	20.000	20.000
65	Chhitauni - Jataha	6400.000	6500.000	100.000	20.000	20.000
66	Chhitauni - Jataha	6500.000	6600.000	100.000	20.000	20.000
67	Chhitauni - Jataha	6600.000	6700.000	100.000	20.000	20.000
68	Chhitauni - Jataha	6700.000	6800.000	100.000	20.000	20.000
69	Chhitauni - Jataha	6800.000	6900.000	100.000	20.000	20.000
70	Chhitauni - Jataha	6900.000	7000.000	100.000	20.000	20.000
71	Chhitauni - Jataha	7000.000	7100.000	100.000	20.000	20.000
72	Chhitauni - Jataha	7100.000	7200.000	100.000	20.000	20.000
73	Chhitauni - Jataha	7200.000	7300.000	100.000	20.000	20.000
74	Chhitauni - Jataha	7300.000	7400.000	100.000	20.000	20.000
75	Chhitauni - Jataha	7400.000	7500.000	100.000	20.000	20.000
76	Chhitauni - Jataha	7500.000	7600.000	100.000	20.000	20.000
77	Chhitauni - Jataha	7600.000	7700.000	100.000	20.000	20.000
78	Chhitauni - Jataha	7700.000	7800.000	100.000	20.000	20.000
79	Chhitauni - Jataha	7800.000	7900.000	100.000	20.000	20.000
80	Chhitauni - Jataha	7900.000	8000.000	100.000	20.000	20.000
81	Chhitauni - Jataha	8000.000	8100.000	100.000	20.000	20.000
82	Chhitauni - Jataha	8100.000	8200.000	100.000	20.000	20.000
83	Chhitauni - Jataha	8200.000	8300.000	100.000	20.000	20.000
84	Chhitauni - Jataha	8300.000	8400.000	100.000	20.000	20.000
85	Chhitauni - Jataha	8400.000	8500.000	100.000	20.000	20.000
86	Chhitauni - Jataha	8500.000	8600.000	100.000	20.000	20.000
87	Chhitauni - Jataha	8600.000	8700.000	100.000	20.000	20.000
88	Chhitauni - Jataha	8700.000	8800.000	100.000	20.000	20.000
89	Chhitauni - Jataha	8800.000	8900.000	100.000	20.000	20.000
90	Chhitauni - Jataha	8900.000	9000.000	100.000	20.000	20.000
91	Chhitauni - Jataha	9000.000	9100.000	100.000	20.000	20.000
92	Chhitauni - Jataha	9100.000	9200.000	100.000	20.000	20.000
93	Chhitauni - Jataha	9200.000	9300.000	100.000	20.000	20.000
94	Chhitauni - Jataha	9300.000	9400.000	100.000	20.000	20.000
95	Chhitauni - Jataha	9400.000	9500.000	100.000	20.000	20.000
96	Chhitauni - Jataha	9500.000	9600.000	100.000	20.000	20.000
97	Chhitauni - Jataha	9600.000	9700.000	100.000	20.000	20.000
98	Chhitauni - Jataha	9700.000	9800.000	100.000	20.000	20.000
99	Chhitauni - Jataha	9800.000	9900.000	100.000	20.000	20.000
100	Chhitauni - Jataha	9900.000	10000.000	100.000	20.000	20.000
101	Chhitauni - Jataha	10000.000	10100.000	100.000	20.000	20.000
102	Chhitauni - Jataha	10100.000	10200.000	100.000	20.000	20.000
103	Chhitauni - Jataha	10200.000	10300.000	100.000	20.000	20.000
104	Chhitauni - Jataha	10300.000	10400.000	100.000	20.000	20.000
105	Chhitauni - Jataha	10400.000	10500.000	100.000	20.000	20.000
106	Chhitauni - Jataha	10500.000	10600.000	100.000	20.000	20.000
107	Chhitauni - Jataha	10600.000	10700.000	100.000	20.000	20.000
108	Chhitauni - Jataha	10700.000	10800.000	100.000	20.000	20.000



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
109	Chhitauni - Jataha	10800.000	10900.000	100.000	20.000	20.000
110	Chhitauni - Jataha	10900.000	11000.000	100.000	20.000	20.000
111	Chhitauni - Jataha	11000.000	11100.000	100.000	20.000	20.000
112	Chhitauni - Jataha	11100.000	11200.000	100.000	20.000	20.000
113	Chhitauni - Jataha	11200.000	11300.000	100.000	20.000	20.000
114	Chhitauni - Jataha	11300.000	11400.000	100.000	20.000	20.000
115	Chhitauni - Jataha	11400.000	11500.000	100.000	20.000	20.000
116	Chhitauni - Jataha	11500.000	11600.000	100.000	20.000	20.000
117	Chhitauni - Jataha	11600.000	11700.000	100.000	20.000	20.000
118	Chhitauni - Jataha	11700.000	11800.000	100.000	20.000	20.000
119	Chhitauni - Jataha	11800.000	11900.000	100.000	20.000	20.000
120	Chhitauni - Jataha	11900.000	12000.000	100.000	20.000	20.000
121	Chhitauni - Jataha	12000.000	12100.000	100.000	20.000	20.000
122	Chhitauni - Jataha	12100.000	12200.000	100.000	20.000	20.000
123	Chhitauni - Jataha	12200.000	12300.000	100.000	20.000	20.000
124	Chhitauni - Jataha	12300.000	12400.000	100.000	20.000	20.000
125	Chhitauni - Jataha	12400.000	12500.000	100.000	20.000	20.000
126	Chhitauni - Jataha	12500.000	12600.000	100.000	20.000	20.000
127	Chhitauni - Jataha	12600.000	12700.000	100.000	20.000	20.000
128	Chhitauni - Jataha	12700.000	12800.000	100.000	20.000	20.000
129	Chhitauni - Jataha	12800.000	12900.000	100.000	20.000	20.000
130	Chhitauni - Jataha	12900.000	13000.000	100.000	20.000	20.000
131	Chhitauni - Jataha	13000.000	13100.000	100.000	20.000	20.000
132	Chhitauni - Jataha	13100.000	13200.000	100.000	20.000	20.000
133	Chhitauni - Jataha	13200.000	13300.000	100.000	20.000	20.000
134	Chhitauni - Jataha	13300.000	13400.000	100.000	20.000	20.000
135	Chhitauni - Jataha	13400.000	13500.000	100.000	20.000	20.000
136	Chhitauni - Jataha	13500.000	13600.000	100.000	20.000	20.000
137	Chhitauni - Jataha	13600.000	13700.000	100.000	20.000	20.000
138	Chhitauni - Jataha	13700.000	13800.000	100.000	20.000	20.000
139	Chhitauni - Jataha	13800.000	13900.000	100.000	20.000	20.000
140	Chhitauni - Jataha	13900.000	14000.000	100.000	20.000	20.000
141	Chhitauni - Jataha	14000.000	14100.000	100.000	20.000	20.000
142	Chhitauni - Jataha	14100.000	14200.000	100.000	20.000	20.000
143	Chhitauni - Jataha	14200.000	14300.000	100.000	20.000	20.000
144	Chhitauni - Jataha	14300.000	14400.000	100.000	20.000	20.000
145	Chhitauni - Jataha	14400.000	14500.000	100.000	20.000	20.000
146	Chhitauni - Jataha	14500.000	14600.000	100.000	20.000	20.000
147	Chhitauni - Jataha	14600.000	14700.000	100.000	20.000	20.000
148	Chhitauni - Jataha	14700.000	14800.000	100.000	60.000	40.000
149	Chhitauni - Jataha	14800.000	14900.000	100.000	60.000	40.000
150	Chhitauni - Jataha	14900.000	15000.000	100.000	60.000	40.000
151	Chhitauni - Jataha	15000.000	15100.000	100.000	60.000	40.000
152	Chhitauni - Jataha	15100.000	15200.000	100.000	60.000	40.000
153	Chhitauni - Jataha	15200.000	15300.000	100.000	60.000	40.000
154	Chhitauni - Jataha	15300.000	15400.000	100.000	60.000	40.000
155	Chhitauni - Jataha	15400.000	15500.000	100.000	60.000	40.000
156	Jataha Yard	15500.000	15600.000	100.000	60.000	40.000
157	Jataha Yard	15600.000	15700.000	100.000	60.000	40.000
158	Jataha Yard	15700.000	15800.000	100.000	60.000	40.000
159	Jataha Yard	15800.000	15900.000	100.000	60.000	40.000
160	Jataha Yard	15900.000	16000.000	100.000	60.000	40.000
161	Jataha Yard	16000.000	16100.000	100.000	60.000	40.000
162	Jataha Yard	16100.000	16200.000	100.000	60.000	40.000



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
163	Jataha Yard	16200.000	16300.000	100.000	60.000	40.000
164	Jataha Yard	16300.000	16400.000	100.000	60.000	40.000
165	Jataha Yard	16400.000	16500.000	100.000	60.000	40.000
166	Jataha Yard	16500.000	16600.000	100.000	60.000	40.000
167	Jataha Yard	16600.000	16700.000	100.000	60.000	40.000
168	Jataha - Madhubani	16700.000	16800.000	100.000	20.000	20.000
169	Jataha - Madhubani	16800.000	16900.000	100.000	20.000	20.000
170	Jataha - Madhubani	16900.000	17000.000	100.000	20.000	20.000
171	Jataha - Madhubani	17000.000	17100.000	100.000	20.000	20.000
172	Jataha - Madhubani	17100.000	17200.000	100.000	20.000	20.000
173	Jataha - Madhubani	17200.000	17300.000	100.000	20.000	20.000
174	Jataha - Madhubani	17300.000	17400.000	100.000	20.000	20.000
175	Jataha - Madhubani	17400.000	17500.000	100.000	20.000	20.000
176	Jataha - Madhubani	17500.000	17600.000	100.000	20.000	20.000
177	Jataha - Madhubani	17600.000	17700.000	100.000	20.000	20.000
178	Jataha - Madhubani	17700.000	17800.000	100.000	20.000	20.000
179	Jataha - Madhubani	17800.000	17900.000	100.000	20.000	20.000
180	Jataha - Madhubani	17900.000	18000.000	100.000	20.000	20.000
181	Jataha - Madhubani	18000.000	18100.000	100.000	20.000	20.000
182	Jataha - Madhubani	18100.000	18200.000	100.000	20.000	20.000
183	Jataha - Madhubani	18200.000	18300.000	100.000	20.000	20.000
184	Jataha - Madhubani	18300.000	18400.000	100.000	20.000	20.000
185	Jataha - Madhubani	18400.000	18500.000	100.000	20.000	20.000
186	Jataha - Madhubani	18500.000	18600.000	100.000	20.000	20.000
187	Jataha - Madhubani	18600.000	18700.000	100.000	20.000	20.000
188	Jataha - Madhubani	18700.000	18800.000	100.000	20.000	20.000
189	Jataha - Madhubani	18800.000	18900.000	100.000	20.000	20.000
190	Jataha - Madhubani	18900.000	19000.000	100.000	20.000	20.000
191	Jataha - Madhubani	19000.000	19100.000	100.000	20.000	20.000
192	Jataha - Madhubani	19100.000	19200.000	100.000	20.000	20.000
193	Jataha - Madhubani	19200.000	19300.000	100.000	20.000	20.000
194	Jataha - Madhubani	19300.000	19400.000	100.000	20.000	20.000
195	Jataha - Madhubani	19400.000	19500.000	100.000	20.000	20.000
196	Jataha - Madhubani	19500.000	19600.000	100.000	20.000	20.000
197	Jataha - Madhubani	19600.000	19700.000	100.000	20.000	20.000
198	Jataha - Madhubani	19700.000	19800.000	100.000	20.000	20.000
199	Jataha - Madhubani	19800.000	19900.000	100.000	20.000	20.000
200	Jataha - Madhubani	19900.000	20000.000	100.000	20.000	20.000
201	Jataha - Madhubani	20000.000	20100.000	100.000	20.000	20.000
202	Jataha - Madhubani	20100.000	20200.000	100.000	20.000	20.000
203	Jataha - Madhubani	20200.000	20300.000	100.000	20.000	20.000
204	Jataha - Madhubani	20300.000	20400.000	100.000	20.000	20.000
205	Jataha - Madhubani	20400.000	20500.000	100.000	20.000	20.000
206	Jataha - Madhubani	20500.000	20600.000	100.000	20.000	20.000
207	Jataha - Madhubani	20600.000	20700.000	100.000	20.000	20.000
208	Jataha - Madhubani	20700.000	20800.000	100.000	20.000	20.000
209	Jataha - Madhubani	20800.000	20900.000	100.000	20.000	20.000
210	Jataha - Madhubani	20900.000	21000.000	100.000	20.000	20.000
211	Jataha - Madhubani	21000.000	21100.000	100.000	20.000	20.000
212	Jataha - Madhubani	21100.000	21200.000	100.000	20.000	20.000
213	Jataha - Madhubani	21200.000	21300.000	100.000	20.000	20.000
214	Jataha - Madhubani	21300.000	21400.000	100.000	20.000	20.000
215	Jataha - Madhubani	21400.000	21500.000	100.000	20.000	20.000
216	Jataha - Madhubani	21500.000	21600.000	100.000	20.000	20.000



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
217	Jataha - Madhubani	21600.000	21700.000	100.000	20.000	20.000
218	Jataha - Madhubani	21700.000	21800.000	100.000	20.000	20.000
219	Jataha - Madhubani	21800.000	21900.000	100.000	20.000	20.000
220	Jataha - Madhubani	21900.000	22000.000	100.000	20.000	20.000
221	Jataha - Madhubani	22000.000	22100.000	100.000	20.000	20.000
222	Jataha - Madhubani	22100.000	22200.000	100.000	20.000	20.000
223	Jataha - Madhubani	22200.000	22300.000	100.000	20.000	20.000
224	Jataha - Madhubani	22300.000	22400.000	100.000	20.000	20.000
225	Jataha - Madhubani	22400.000	22500.000	100.000	20.000	20.000
226	Jataha - Madhubani	22500.000	22600.000	100.000	20.000	20.000
227	Jataha - Madhubani	22600.000	22700.000	100.000	20.000	20.000
228	Jataha - Madhubani	22700.000	22800.000	100.000	20.000	20.000
229	Jataha - Madhubani	22800.000	22900.000	100.000	20.000	20.000
230	Jataha - Madhubani	22900.000	23000.000	100.000	20.000	20.000
231	Jataha - Madhubani	23000.000	23100.000	100.000	20.000	20.000
232	Jataha - Madhubani	23100.000	23200.000	100.000	20.000	20.000
233	Jataha - Madhubani	23200.000	23300.000	100.000	20.000	20.000
234	Jataha - Madhubani	23300.000	23400.000	100.000	20.000	20.000
235	Jataha - Madhubani	23400.000	23500.000	100.000	20.000	20.000
236	Jataha - Madhubani	23500.000	23600.000	100.000	20.000	20.000
237	Jataha - Madhubani	23600.000	23700.000	100.000	20.000	20.000
238	Jataha - Madhubani	23700.000	23800.000	100.000	20.000	20.000
239	Jataha - Madhubani	23800.000	23900.000	100.000	20.000	20.000
240	Jataha - Madhubani	23900.000	24000.000	100.000	20.000	20.000
241	Jataha - Madhubani	24000.000	24100.000	100.000	20.000	20.000
242	Jataha - Madhubani	24100.000	24200.000	100.000	20.000	20.000
243	Jataha - Madhubani	24200.000	24300.000	100.000	20.000	20.000
244	Jataha - Madhubani	24300.000	24400.000	100.000	20.000	20.000
245	Jataha - Madhubani	24400.000	24500.000	100.000	20.000	20.000
246	Jataha - Madhubani	24500.000	24600.000	100.000	20.000	20.000
247	Jataha - Madhubani	24600.000	24700.000	100.000	20.000	20.000
248	Jataha - Madhubani	24700.000	24800.000	100.000	20.000	20.000
249	Jataha - Madhubani	24800.000	24900.000	100.000	20.000	20.000
250	Jataha - Madhubani	24900.000	25000.000	100.000	20.000	20.000
251	Jataha - Madhubani	25000.000	25100.000	100.000	20.000	20.000
252	Jataha - Madhubani	25100.000	25200.000	100.000	20.000	20.000
253	Jataha - Madhubani	25200.000	25300.000	100.000	20.000	20.000
254	Jataha - Madhubani	25300.000	25400.000	100.000	20.000	20.000
255	Jataha - Madhubani	25400.000	25500.000	100.000	20.000	20.000
256	Jataha - Madhubani	25500.000	25600.000	100.000	20.000	20.000
257	Jataha - Madhubani	25600.000	25700.000	100.000	20.000	20.000
258	Jataha - Madhubani	25700.000	25800.000	100.000	20.000	20.000
259	Jataha - Madhubani	25800.000	25900.000	100.000	20.000	20.000
260	Jataha - Madhubani	25900.000	26000.000	100.000	20.000	20.000
261	Jataha - Madhubani	26000.000	26100.000	100.000	20.000	20.000
262	Jataha - Madhubani	26100.000	26200.000	100.000	20.000	20.000
263	Jataha - Madhubani	26200.000	26300.000	100.000	20.000	20.000
264	Jataha - Madhubani	26300.000	26400.000	100.000	20.000	20.000
265	Jataha - Madhubani	26400.000	26500.000	100.000	20.000	20.000
266	Jataha - Madhubani	26500.000	26600.000	100.000	20.000	20.000
267	Jataha - Madhubani	26600.000	26700.000	100.000	20.000	20.000
268	Jataha - Madhubani	26700.000	26800.000	100.000	20.000	20.000
269	Jataha - Madhubani	26800.000	26900.000	100.000	20.000	20.000
270	Jataha - Madhubani	26900.000	27000.000	100.000	20.000	20.000



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S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
271	Jataha - Madhubani	27000.000	27100.000	100.000	20.000	20.000
272	Jataha - Madhubani	27100.000	27200.000	100.000	20.000	20.000
273	Jataha - Madhubani	27200.000	27300.000	100.000	20.000	20.000
274	Jataha - Madhubani	27300.000	27400.000	100.000	20.000	20.000
275	Jataha - Madhubani	27400.000	27500.000	100.000	20.000	20.000
276	Jataha - Madhubani	27500.000	27600.000	100.000	20.000	20.000
277	Jataha - Madhubani	27600.000	27700.000	100.000	20.000	20.000
278	Madhubani Yard	27700.000	27800.000	100.000	40.000	60.000
279	Madhubani Yard	27800.000	27900.000	100.000	40.000	60.000
280	Madhubani Yard	27900.000	28000.000	100.000	40.000	60.000
281	Madhubani Yard	28000.000	28100.000	100.000	40.000	60.000
282	Madhubani Yard	28100.000	28200.000	100.000	40.000	60.000
283	Madhubani Yard	28200.000	28300.000	100.000	40.000	60.000
284	Madhubani Yard	28300.000	28400.000	100.000	40.000	60.000
285	Madhubani Yard	28400.000	28500.000	100.000	40.000	60.000
286	Madhubani Yard	28500.000	28600.000	100.000	40.000	60.000
287	Madhubani Yard	28600.000	28700.000	100.000	40.000	60.000
288	Madhubani Yard	28700.000	28800.000	100.000	40.000	60.000
289	Madhubani Yard	28800.000	28850.000	50.000	40.000	60.000
290	Madhubani Yard	28850.000	28900.000	50.000	40.000	75.000
291	Madhubani Yard	28900.000	29000.000	100.000	40.000	75.000
292	Madhubani Yard	29000.000	29100.000	100.000	40.000	75.000
293	Madhubani Yard	29100.000	29200.000	100.000	40.000	75.000
294	Madhubani	29200.000	29300.000	100.000	20.000	20.000
295	Madhubani	29300.000	29400.000	100.000	20.000	20.000

b. Non-Core Land

The Site of the Railway Project comprises the land described below:

S. No	Name of location From	Name of location To	Start chainage (km)	End chainage (km)	Land width (m)	Remarks
Nil						

4. Details of existing structures and facilities on adjoining railway track

4.1 Permanent Way

Details of the Permanent Way on the Right of Way are:



S. No.	No. of railway line	km from	km to	Route km	Minimum and Maximum Implantation (if electrified)	Remarks
1	1	0.000	2.609	2.609	NA	52 KG Rail, 60KG sleeper, Including 4 Turnout & 1 No. Loop Line
2	2	2.609	3.594	0.985	NA	

4.2 Important Bridges

The Site includes the following Important Bridges:

S. No.	Bridge No. and location (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundati on	Sub-structu re	Superstructu re		
N/A						

4.3 Major Bridges

The Site includes the following Major Bridges:

S. No.	Bridge No. and location (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Superstructure		
N/A						

4.4 Minor Bridges/Culverts

The Site includes the following Minor Bridges and culverts:

S. No.	Bridge No. and location (km)	Type of Structure			No. of Spans with span length (m)	Width of the bridge (m)
		Foundati on	Sub-structu re	Superstructu re		
1	4 (5532.885)	RCC Box (The RCC box has already been constructed at site)			1×2×2	2.0
2	6 (6287.882)	RCC Box (The RCC box has already been constructed at site)			1×2×2	2.0



4.5 Tunnels

S. No.	Block Section	km from	km to	Remarks
N/A				

4.6 Railway Flyovers

The Site includes the following Railway Fly Over:

S. No.	Block Section	Bridge No and location (Km)	Type of Structure			Span (Nos. × length)	Width (m)
			Found ⁿ	Sub-structure	Super-structure		
N/A							

4.7 Road under-bridges (RUB)/ road over-bridges (ROB)

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

S. No.	Block Section	Bridge No. and location (km)	Type of Structure		Span (Nos. × length)	Width (m)/ height (m)	ROB/ RUB
			Founda ⁿ	Super-structure			
1	Paniahwa to Chhitauni	1	Well	PSC Beam Girder & Composite Girder	2×11.650 +22×24.000	-	ROB under construction in lieu of LC 1A

4.8 Railway Level Crossings

The Site includes the following railway level crossings:

S. N.	Block Section	Chainage	LC No	TVUs	L C Classification	Remarks
1	Paniahwa-Chhitauni	819.455	1A ‘C’	-	CLASS (M)	Closed for Train Traffic



4.9 Railway Stations on Railway Project

The Site includes the following railway stations

S. No.	Station	C.L. km	Nos. of Lines	Station Building Area	Nos. of P.F. & Length	Remarks (Whether Jn. Station)
1	Paniahwa	0.000	3	-	1 No. (550M)	Crossing
2	Chhitauni	3.117	2	-	1 No. (550M)	Crossing (non-functional)

4.10 Railway yards

The Site includes the following railway yards:

Sr. No.	Name of Yard	Number of Lines	Remarks
1	Paniahwa	3	
2	Chhitauni	2	

4.11 Foot Over Bridges on Railway Project

The Site includes the following foot over bridges:

S. No.	Station Block Section	Chainage	Span/Nos. of Track	Remarks
1	Paniahwa	0000	3	1 No. FOB

4.12 Transmission Lines Crossing the Right of Way

The Site includes the following transmission lines crossing the Right of Way:

S. N.	Block Section	Chainage	HT/LT (Specify KV)	OH/UG	Height above RL/Depth below RL
1	Chhitauni-	4+500-600	11kV	OH	As per IR SOD-2022 all
2		4+600-700	11kV	OH	
3		5+900-6+000	33kV	OH	
4		7+000-100	11kV	OH	
5		9+200-300	11kV	OH	
6		9+500-600	11kV	OH	
7		10+800-900	11kV	OH	
8		10+900-11+000	11kV	OH	



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S. N.	Block Section	Chainage	HT/LT (Specify KV)	OH/UG	Height above RL/Depth below RL
9	Jataha	12+100-200	11kV	OH	the HT/LT lines upto 33kV should be underground.
10		12+300-400	33kV	OH	
11		13+800-900	11kV	OH	
12		14+200-300	11kV	OH	
13		14+300-400	11kV	OH	
14	Jataha-Madhubani	20+000-100	11kV	OH	
15		20+300-400	11kV	OH	
16		20+400-500	11kV	OH	
17		20+900-21+000	11kV	OH	
18		20+900-21+000	33kV	OH	
19		21+100-200	11kV	OH	
20		21+300-400	11kV	OH	
21		21+700-800	11kV	OH	
22		21+800-900	11kV	OH	
23		22+200-300	11kV	OH	
24		22+800-900	11kV	OH	
25		23+800-900	33kV	OH	
26		23+900-24+000	11kV	OH	
27		24+600-700	11kV	OH	
28		24+700-800	11kV	OH	
29		25+000-100	11kV	OH	
30		25+600-700	11kV	OH	
31		26+100-200	11kV	OH	
32		26+500-600	33kV	OH	
33		28+800-900	11kV	OH	
34		29+000-100	11kV	OH	
35		29+300-400	11kV	OH	
36		7+750-900	11KV	OH	
37		10+800-11+100	11KV	OH	
38		10+800-11+100	11KV	OH	
39		21+100-200	11kV	OH	
40		23+950-24+300	11KV	OH	
41		24+900-25+000	11kV	OH	
42	Madhubani-	29+000-100	11KV	OH	
43	..	29+200-300	11kV	OH	

Note: The modification of above overhead HT/LT line to under ground or rising the height of transmission line or shifting of existing pole/tower/line from alignment of track are not in the scope of project.

4.13 Underground power line crossing the Right of Way



The Site includes the following Underground Power Line Crossings

Sr. No.	Location	System Voltage	Distance of Structure from centre of Track	Remarks
NIL				

4.14 Signalling infrastructure

The Site includes the following signalling infrastructure:

S.No.	Station	Standard of Interlocking	Existing Signalling System (RRI/TBM Rly)	Type of Signals (Single distant/ double distant/ colour light)	Remarks
1	Chhitauni	Nil	Nil	Nil	Nil
ADJACENT STATION DETAILS:					
1	Paniahwa Jn	STD - III	Centralized EI is proposed New Line work	DISTANT SIGNAL/MACLS	NIL

4.15 Telecommunication infrastructure

The Site includes the following telecommunication infrastructure:

S.No.	Station	Control Phone	DOT	Any other Communication	Availability of OFC
1	Chhitauni	Nil	Nil	Nil	Nil

4.16 Any Other Existing Building & Structures

S.No.	Location	Type of Structure	Size of Structures	Remarks
1	Chhitauni	Station Building	-	Existing Structure (non-functional)

4.17 Canal/Channel- NIL

4.18 Non-Railway Utilities (Way Leave facilities)

No diversion of any way leave is involved as per existing conditions; however, the Contractor shall take due care to protect existing way leave facilities and any damage caused to any facility during working of Contractor



either in the presence or absence of Railway Representative, shall be the sole responsibility of the Contractor and any repair, damage claim whatsoever made by the owner of facility shall be settled by the Contractor and no claim on this account under any circumstances will be entertained by the Railway.

4.19 Detection of Hidden Utilities

Although utmost care has been taken to detect all existing utilities and list them in this document; however, the possibility of any hidden utility remaining un-traced can not be ruled out. Therefore, Contractor on taking over land from railway shall carry out a survey using ground penetrating Radar or any other similar equipment to trace all such utilities which may require shifting for execution of project activity (ies) and are not mentioned in this document. He shall bring the existence of all such utilities to the notice of Authority Engineer immediately and consequently take further action as advised by the Authority Engineer and as per conditions of this document.



Annex - II
(Schedule-A)

Dates for providing Right of Way

The following are complete details of the Right of Way showing the dates on which the Authority shall provide the different sections of the Right of Way to the Contractor:

Sl. No	From km to km	Length (km)	Distance of Railway Boundary from C/L of [UP/DN] line (in m)		Date of providing Right of Way
			Right Hand Side	Left Hand Side	
1	2	3	4	5	6
Part A:					
Right of Way being 95% (ninety five percent) of the core land length and 90 % (ninety percent) of the non-core length of the Project, under Clauses 4.1.3 read with Clauses 8.2 and 8.3 of the Agreement	Km. 0.350 to Km. 29.400	29.050	Details provided in the table below		Within 15 (fifteen) days of the signing of the Agreement or with in 30 (thirty) days of the date of receiving the Performance Security from the Contractor, whichever is later.

Route Length

S. N.	Name of location From	Name of location To	Start Chainage (km)	End Chainage (km)	Length (km)	Remarks
1	Paniahwa Jn. (Excluding)	Madhubani (Including)	0+350 (0.350)	29+400 (29.400)	29.050	Paniahwa Yard excluded and other three yards i.e. Chhitauni, Jataha & Madhubani are included)



Core Land

The Site of the Railway Project comprises the land described below:

S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
1	Paniahwa - Chhitauni	350.000	400.000	50.000	Railway Land	Railway Land
2	Paniahwa - Chhitauni	400.000	500.000	100.000	Railway Land	Railway Land
3	Paniahwa - Chhitauni	500.000	600.000	100.000	Railway Land	Railway Land
4	Paniahwa - Chhitauni	600.000	700.000	100.000	Railway Land	Railway Land
5	Paniahwa - Chhitauni	700.000	800.000	100.000	45.000	75.000
6	Paniahwa - Chhitauni	800.000	900.000	100.000	45.000	75.000
7	Paniahwa - Chhitauni	900.000	1000.000	100.000	45.000	75.000
8	Paniahwa - Chhitauni	1000.000	1100.000	100.000	45.000	75.000
9	Paniahwa - Chhitauni	1100.000	1200.000	100.000	45.000	75.000
10	Paniahwa - Chhitauni	1200.000	1300.000	100.000	45.000	75.000
11	Paniahwa - Chhitauni	1300.000	1400.000	100.000	45.000	75.000
12	Paniahwa - Chhitauni	1400.000	1500.000	100.000	45.000	75.000
13	Paniahwa - Chhitauni	1500.000	1600.000	100.000	45.000	75.000
14	Paniahwa - Chhitauni	1600.000	1700.000	100.000	45.000	75.000
15	Paniahwa - Chhitauni	1700.000	1800.000	100.000	45.000	75.000
16	Paniahwa - Chhitauni	1800.000	1900.000	100.000	45.000	75.000
17	Paniahwa - Chhitauni	1900.000	2000.000	100.000	45.000	75.000
18	Paniahwa - Chhitauni	2000.000	2100.000	100.000	45.000	75.000
19	Paniahwa - Chhitauni	2100.000	2200.000	100.000	45.000	75.000
20	Paniahwa - Chhitauni	2200.000	2300.000	100.000	45.000	75.000
21	Paniahwa - Chhitauni	2300.000	2400.000	100.000	45.000	75.000
22	Paniahwa - Chhitauni	2400.000	2467.000	67.000	45.000	75.000
23	Paniahwa - Chhitauni	2467.000	2500.000	33.000	45.000	75.000
24	Paniahwa - Chhitauni	2500.000	2600.000	100.000	45.000	75.000
25	Paniahwa - Chhitauni	2600.000	2635.000	35.000	45.000	75.000
26	Chhitauni Yard	2635.000	2700.000	65.000	45.000	75.000
27	Chhitauni Yard	2700.000	2800.000	100.000	45.000	75.000
28	Chhitauni Yard	2800.000	2900.000	100.000	45.000	75.000
29	Chhitauni Yard	2900.000	3000.000	100.000	45.000	75.000
30	Chhitauni Yard	3000.000	3100.000	100.000	45.000	75.000
31	Chhitauni Yard	3100.000	3200.000	100.000	45.000	75.000
32	Chhitauni Yard	3200.000	3300.000	100.000	45.000	75.000
33	Chhitauni Yard	3300.000	3400.000	100.000	45.000	75.000
34	Chhitauni Yard	3400.000	3500.000	100.000	45.000	75.000
35	Chhitauni Yard	3500.000	3600.000	100.000	45.000	75.000
36	Chhitauni Yard	3600.000	3650.000	50.000	45.000	75.000
37	Chhitauni - Jataha	3650.000	3700.000	50.000	40.000	42.000
38	Chhitauni - Jataha	3700.000	3800.000	100.000	40.000	42.000
39	Chhitauni - Jataha	3800.000	3900.000	100.000	40.000	42.000
40	Chhitauni - Jataha	3900.000	4000.000	100.000	40.000	42.000
41	Chhitauni - Jataha	4000.000	4150.000	150.000	40.000	42.000
42	Chhitauni - Jataha	4150.000	4200.000	50.000	20.000	20.000
43	Chhitauni - Jataha	4200.000	4300.000	100.000	20.000	20.000
44	Chhitauni - Jataha	4300.000	4400.000	100.000	20.000	20.000
45	Chhitauni - Jataha	4400.000	4500.000	100.000	20.000	20.000
46	Chhitauni - Jataha	4500.000	4600.000	100.000	20.000	20.000
47	Chhitauni - Jataha	4600.000	4700.000	100.000	20.000	20.000
48	Chhitauni - Jataha	4700.000	4800.000	100.000	20.000	20.000
49	Chhitauni - Jataha	4800.000	4900.000	100.000	20.000	20.000



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S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
50	Chhitauni - Jataha	4900.000	5000.000	100.000	20.000	20.000
51	Chhitauni - Jataha	5000.000	5100.000	100.000	20.000	20.000
52	Chhitauni - Jataha	5100.000	5200.000	100.000	20.000	20.000
53	Chhitauni - Jataha	5200.000	5300.000	100.000	20.000	20.000
54	Chhitauni - Jataha	5300.000	5400.000	100.000	20.000	20.000
55	Chhitauni - Jataha	5400.000	5500.000	100.000	20.000	20.000
56	Chhitauni - Jataha	5500.000	5600.000	100.000	20.000	20.000
57	Chhitauni - Jataha	5600.000	5700.000	100.000	20.000	20.000
58	Chhitauni - Jataha	5700.000	5800.000	100.000	20.000	20.000
59	Chhitauni - Jataha	5800.000	5900.000	100.000	20.000	20.000
60	Chhitauni - Jataha	5900.000	6000.000	100.000	20.000	20.000
61	Chhitauni - Jataha	6000.000	6100.000	100.000	20.000	20.000
62	Chhitauni - Jataha	6100.000	6200.000	100.000	20.000	20.000
63	Chhitauni - Jataha	6200.000	6300.000	100.000	20.000	20.000
64	Chhitauni - Jataha	6300.000	6400.000	100.000	20.000	20.000
65	Chhitauni - Jataha	6400.000	6500.000	100.000	20.000	20.000
66	Chhitauni - Jataha	6500.000	6600.000	100.000	20.000	20.000
67	Chhitauni - Jataha	6600.000	6700.000	100.000	20.000	20.000
68	Chhitauni - Jataha	6700.000	6800.000	100.000	20.000	20.000
69	Chhitauni - Jataha	6800.000	6900.000	100.000	20.000	20.000
70	Chhitauni - Jataha	6900.000	7000.000	100.000	20.000	20.000
71	Chhitauni - Jataha	7000.000	7100.000	100.000	20.000	20.000
72	Chhitauni - Jataha	7100.000	7200.000	100.000	20.000	20.000
73	Chhitauni - Jataha	7200.000	7300.000	100.000	20.000	20.000
74	Chhitauni - Jataha	7300.000	7400.000	100.000	20.000	20.000
75	Chhitauni - Jataha	7400.000	7500.000	100.000	20.000	20.000
76	Chhitauni - Jataha	7500.000	7600.000	100.000	20.000	20.000
77	Chhitauni - Jataha	7600.000	7700.000	100.000	20.000	20.000
78	Chhitauni - Jataha	7700.000	7800.000	100.000	20.000	20.000
79	Chhitauni - Jataha	7800.000	7900.000	100.000	20.000	20.000
80	Chhitauni - Jataha	7900.000	8000.000	100.000	20.000	20.000
81	Chhitauni - Jataha	8000.000	8100.000	100.000	20.000	20.000
82	Chhitauni - Jataha	8100.000	8200.000	100.000	20.000	20.000
83	Chhitauni - Jataha	8200.000	8300.000	100.000	20.000	20.000
84	Chhitauni - Jataha	8300.000	8400.000	100.000	20.000	20.000
85	Chhitauni - Jataha	8400.000	8500.000	100.000	20.000	20.000
86	Chhitauni - Jataha	8500.000	8600.000	100.000	20.000	20.000
87	Chhitauni - Jataha	8600.000	8700.000	100.000	20.000	20.000
88	Chhitauni - Jataha	8700.000	8800.000	100.000	20.000	20.000
89	Chhitauni - Jataha	8800.000	8900.000	100.000	20.000	20.000
90	Chhitauni - Jataha	8900.000	9000.000	100.000	20.000	20.000
91	Chhitauni - Jataha	9000.000	9100.000	100.000	20.000	20.000
92	Chhitauni - Jataha	9100.000	9200.000	100.000	20.000	20.000
93	Chhitauni - Jataha	9200.000	9300.000	100.000	20.000	20.000
94	Chhitauni - Jataha	9300.000	9400.000	100.000	20.000	20.000
95	Chhitauni - Jataha	9400.000	9500.000	100.000	20.000	20.000
96	Chhitauni - Jataha	9500.000	9600.000	100.000	20.000	20.000
97	Chhitauni - Jataha	9600.000	9700.000	100.000	20.000	20.000
98	Chhitauni - Jataha	9700.000	9800.000	100.000	20.000	20.000
99	Chhitauni - Jataha	9800.000	9900.000	100.000	20.000	20.000
100	Chhitauni - Jataha	9900.000	10000.000	100.000	20.000	20.000
101	Chhitauni - Jataha	10000.000	10100.000	100.000	20.000	20.000
102	Chhitauni - Jataha	10100.000	10200.000	100.000	20.000	20.000
103	Chhitauni - Jataha	10200.000	10300.000	100.000	20.000	20.000



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S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
104	Chhitauni - Jataha	10300.000	10400.000	100.000	20.000	20.000
105	Chhitauni - Jataha	10400.000	10500.000	100.000	20.000	20.000
106	Chhitauni - Jataha	10500.000	10600.000	100.000	20.000	20.000
107	Chhitauni - Jataha	10600.000	10700.000	100.000	20.000	20.000
108	Chhitauni - Jataha	10700.000	10800.000	100.000	20.000	20.000
109	Chhitauni - Jataha	10800.000	10900.000	100.000	20.000	20.000
110	Chhitauni - Jataha	10900.000	11000.000	100.000	20.000	20.000
111	Chhitauni - Jataha	11000.000	11100.000	100.000	20.000	20.000
112	Chhitauni - Jataha	11100.000	11200.000	100.000	20.000	20.000
113	Chhitauni - Jataha	11200.000	11300.000	100.000	20.000	20.000
114	Chhitauni - Jataha	11300.000	11400.000	100.000	20.000	20.000
115	Chhitauni - Jataha	11400.000	11500.000	100.000	20.000	20.000
116	Chhitauni - Jataha	11500.000	11600.000	100.000	20.000	20.000
117	Chhitauni - Jataha	11600.000	11700.000	100.000	20.000	20.000
118	Chhitauni - Jataha	11700.000	11800.000	100.000	20.000	20.000
119	Chhitauni - Jataha	11800.000	11900.000	100.000	20.000	20.000
120	Chhitauni - Jataha	11900.000	12000.000	100.000	20.000	20.000
121	Chhitauni - Jataha	12000.000	12100.000	100.000	20.000	20.000
122	Chhitauni - Jataha	12100.000	12200.000	100.000	20.000	20.000
123	Chhitauni - Jataha	12200.000	12300.000	100.000	20.000	20.000
124	Chhitauni - Jataha	12300.000	12400.000	100.000	20.000	20.000
125	Chhitauni - Jataha	12400.000	12500.000	100.000	20.000	20.000
126	Chhitauni - Jataha	12500.000	12600.000	100.000	20.000	20.000
127	Chhitauni - Jataha	12600.000	12700.000	100.000	20.000	20.000
128	Chhitauni - Jataha	12700.000	12800.000	100.000	20.000	20.000
129	Chhitauni - Jataha	12800.000	12900.000	100.000	20.000	20.000
130	Chhitauni - Jataha	12900.000	13000.000	100.000	20.000	20.000
131	Chhitauni - Jataha	13000.000	13100.000	100.000	20.000	20.000
132	Chhitauni - Jataha	13100.000	13200.000	100.000	20.000	20.000
133	Chhitauni - Jataha	13200.000	13300.000	100.000	20.000	20.000
134	Chhitauni - Jataha	13300.000	13400.000	100.000	20.000	20.000
135	Chhitauni - Jataha	13400.000	13500.000	100.000	20.000	20.000
136	Chhitauni - Jataha	13500.000	13600.000	100.000	20.000	20.000
137	Chhitauni - Jataha	13600.000	13700.000	100.000	20.000	20.000
138	Chhitauni - Jataha	13700.000	13800.000	100.000	20.000	20.000
139	Chhitauni - Jataha	13800.000	13900.000	100.000	20.000	20.000
140	Chhitauni - Jataha	13900.000	14000.000	100.000	20.000	20.000
141	Chhitauni - Jataha	14000.000	14100.000	100.000	20.000	20.000
142	Chhitauni - Jataha	14100.000	14200.000	100.000	20.000	20.000
143	Chhitauni - Jataha	14200.000	14300.000	100.000	20.000	20.000
144	Chhitauni - Jataha	14300.000	14400.000	100.000	20.000	20.000
145	Chhitauni - Jataha	14400.000	14500.000	100.000	20.000	20.000
146	Chhitauni - Jataha	14500.000	14600.000	100.000	20.000	20.000
147	Chhitauni - Jataha	14600.000	14700.000	100.000	20.000	20.000
148	Chhitauni - Jataha	14700.000	14800.000	100.000	60.000	40.000
149	Chhitauni - Jataha	14800.000	14900.000	100.000	60.000	40.000
150	Chhitauni - Jataha	14900.000	15000.000	100.000	60.000	40.000
151	Chhitauni - Jataha	15000.000	15100.000	100.000	60.000	40.000
152	Chhitauni - Jataha	15100.000	15200.000	100.000	60.000	40.000
153	Chhitauni - Jataha	15200.000	15300.000	100.000	60.000	40.000
154	Chhitauni - Jataha	15300.000	15400.000	100.000	60.000	40.000
155	Chhitauni - Jataha	15400.000	15500.000	100.000	60.000	40.000
156	Jataha Yard	15500.000	15600.000	100.000	60.000	40.000
157	Jataha Yard	15600.000	15700.000	100.000	60.000	40.000



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
158	Jataha Yard	15700.000	15800.000	100.000	60.000	40.000
159	Jataha Yard	15800.000	15900.000	100.000	60.000	40.000
160	Jataha Yard	15900.000	16000.000	100.000	60.000	40.000
161	Jataha Yard	16000.000	16100.000	100.000	60.000	40.000
162	Jataha Yard	16100.000	16200.000	100.000	60.000	40.000
163	Jataha Yard	16200.000	16300.000	100.000	60.000	40.000
164	Jataha Yard	16300.000	16400.000	100.000	60.000	40.000
165	Jataha Yard	16400.000	16500.000	100.000	60.000	40.000
166	Jataha Yard	16500.000	16600.000	100.000	60.000	40.000
167	Jataha Yard	16600.000	16700.000	100.000	60.000	40.000
168	Jataha - Madhubani	16700.000	16800.000	100.000	20.000	20.000
169	Jataha - Madhubani	16800.000	16900.000	100.000	20.000	20.000
170	Jataha - Madhubani	16900.000	17000.000	100.000	20.000	20.000
171	Jataha - Madhubani	17000.000	17100.000	100.000	20.000	20.000
172	Jataha - Madhubani	17100.000	17200.000	100.000	20.000	20.000
173	Jataha - Madhubani	17200.000	17300.000	100.000	20.000	20.000
174	Jataha - Madhubani	17300.000	17400.000	100.000	20.000	20.000
175	Jataha - Madhubani	17400.000	17500.000	100.000	20.000	20.000
176	Jataha - Madhubani	17500.000	17600.000	100.000	20.000	20.000
177	Jataha - Madhubani	17600.000	17700.000	100.000	20.000	20.000
178	Jataha - Madhubani	17700.000	17800.000	100.000	20.000	20.000
179	Jataha - Madhubani	17800.000	17900.000	100.000	20.000	20.000
180	Jataha - Madhubani	17900.000	18000.000	100.000	20.000	20.000
181	Jataha - Madhubani	18000.000	18100.000	100.000	20.000	20.000
182	Jataha - Madhubani	18100.000	18200.000	100.000	20.000	20.000
183	Jataha - Madhubani	18200.000	18300.000	100.000	20.000	20.000
184	Jataha - Madhubani	18300.000	18400.000	100.000	20.000	20.000
185	Jataha - Madhubani	18400.000	18500.000	100.000	20.000	20.000
186	Jataha - Madhubani	18500.000	18600.000	100.000	20.000	20.000
187	Jataha - Madhubani	18600.000	18700.000	100.000	20.000	20.000
188	Jataha - Madhubani	18700.000	18800.000	100.000	20.000	20.000
189	Jataha - Madhubani	18800.000	18900.000	100.000	20.000	20.000
190	Jataha - Madhubani	18900.000	19000.000	100.000	20.000	20.000
191	Jataha - Madhubani	19000.000	19100.000	100.000	20.000	20.000
192	Jataha - Madhubani	19100.000	19200.000	100.000	20.000	20.000
193	Jataha - Madhubani	19200.000	19300.000	100.000	20.000	20.000
194	Jataha - Madhubani	19300.000	19400.000	100.000	20.000	20.000
195	Jataha - Madhubani	19400.000	19500.000	100.000	20.000	20.000
196	Jataha - Madhubani	19500.000	19600.000	100.000	20.000	20.000
197	Jataha - Madhubani	19600.000	19700.000	100.000	20.000	20.000
198	Jataha - Madhubani	19700.000	19800.000	100.000	20.000	20.000
199	Jataha - Madhubani	19800.000	19900.000	100.000	20.000	20.000
200	Jataha - Madhubani	19900.000	20000.000	100.000	20.000	20.000
201	Jataha - Madhubani	20000.000	20100.000	100.000	20.000	20.000
202	Jataha - Madhubani	20100.000	20200.000	100.000	20.000	20.000
203	Jataha - Madhubani	20200.000	20300.000	100.000	20.000	20.000
204	Jataha - Madhubani	20300.000	20400.000	100.000	20.000	20.000
205	Jataha - Madhubani	20400.000	20500.000	100.000	20.000	20.000
206	Jataha - Madhubani	20500.000	20600.000	100.000	20.000	20.000
207	Jataha - Madhubani	20600.000	20700.000	100.000	20.000	20.000
208	Jataha - Madhubani	20700.000	20800.000	100.000	20.000	20.000
209	Jataha - Madhubani	20800.000	20900.000	100.000	20.000	20.000
210	Jataha - Madhubani	20900.000	21000.000	100.000	20.000	20.000
211	Jataha - Madhubani	21000.000	21100.000	100.000	20.000	20.000



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
212	Jataha - Madhubani	21100.000	21200.000	100.000	20.000	20.000
213	Jataha - Madhubani	21200.000	21300.000	100.000	20.000	20.000
214	Jataha - Madhubani	21300.000	21400.000	100.000	20.000	20.000
215	Jataha - Madhubani	21400.000	21500.000	100.000	20.000	20.000
216	Jataha - Madhubani	21500.000	21600.000	100.000	20.000	20.000
217	Jataha - Madhubani	21600.000	21700.000	100.000	20.000	20.000
218	Jataha - Madhubani	21700.000	21800.000	100.000	20.000	20.000
219	Jataha - Madhubani	21800.000	21900.000	100.000	20.000	20.000
220	Jataha - Madhubani	21900.000	22000.000	100.000	20.000	20.000
221	Jataha - Madhubani	22000.000	22100.000	100.000	20.000	20.000
222	Jataha - Madhubani	22100.000	22200.000	100.000	20.000	20.000
223	Jataha - Madhubani	22200.000	22300.000	100.000	20.000	20.000
224	Jataha - Madhubani	22300.000	22400.000	100.000	20.000	20.000
225	Jataha - Madhubani	22400.000	22500.000	100.000	20.000	20.000
226	Jataha - Madhubani	22500.000	22600.000	100.000	20.000	20.000
227	Jataha - Madhubani	22600.000	22700.000	100.000	20.000	20.000
228	Jataha - Madhubani	22700.000	22800.000	100.000	20.000	20.000
229	Jataha - Madhubani	22800.000	22900.000	100.000	20.000	20.000
230	Jataha - Madhubani	22900.000	23000.000	100.000	20.000	20.000
231	Jataha - Madhubani	23000.000	23100.000	100.000	20.000	20.000
232	Jataha - Madhubani	23100.000	23200.000	100.000	20.000	20.000
233	Jataha - Madhubani	23200.000	23300.000	100.000	20.000	20.000
234	Jataha - Madhubani	23300.000	23400.000	100.000	20.000	20.000
235	Jataha - Madhubani	23400.000	23500.000	100.000	20.000	20.000
236	Jataha - Madhubani	23500.000	23600.000	100.000	20.000	20.000
237	Jataha - Madhubani	23600.000	23700.000	100.000	20.000	20.000
238	Jataha - Madhubani	23700.000	23800.000	100.000	20.000	20.000
239	Jataha - Madhubani	23800.000	23900.000	100.000	20.000	20.000
240	Jataha - Madhubani	23900.000	24000.000	100.000	20.000	20.000
241	Jataha - Madhubani	24000.000	24100.000	100.000	20.000	20.000
242	Jataha - Madhubani	24100.000	24200.000	100.000	20.000	20.000
243	Jataha - Madhubani	24200.000	24300.000	100.000	20.000	20.000
244	Jataha - Madhubani	24300.000	24400.000	100.000	20.000	20.000
245	Jataha - Madhubani	24400.000	24500.000	100.000	20.000	20.000
246	Jataha - Madhubani	24500.000	24600.000	100.000	20.000	20.000
247	Jataha - Madhubani	24600.000	24700.000	100.000	20.000	20.000
248	Jataha - Madhubani	24700.000	24800.000	100.000	20.000	20.000
249	Jataha - Madhubani	24800.000	24900.000	100.000	20.000	20.000
250	Jataha - Madhubani	24900.000	25000.000	100.000	20.000	20.000
251	Jataha - Madhubani	25000.000	25100.000	100.000	20.000	20.000
252	Jataha - Madhubani	25100.000	25200.000	100.000	20.000	20.000
253	Jataha - Madhubani	25200.000	25300.000	100.000	20.000	20.000
254	Jataha - Madhubani	25300.000	25400.000	100.000	20.000	20.000
255	Jataha - Madhubani	25400.000	25500.000	100.000	20.000	20.000
256	Jataha - Madhubani	25500.000	25600.000	100.000	20.000	20.000
257	Jataha - Madhubani	25600.000	25700.000	100.000	20.000	20.000
258	Jataha - Madhubani	25700.000	25800.000	100.000	20.000	20.000
259	Jataha - Madhubani	25800.000	25900.000	100.000	20.000	20.000
260	Jataha - Madhubani	25900.000	26000.000	100.000	20.000	20.000
261	Jataha - Madhubani	26000.000	26100.000	100.000	20.000	20.000
262	Jataha - Madhubani	26100.000	26200.000	100.000	20.000	20.000
263	Jataha - Madhubani	26200.000	26300.000	100.000	20.000	20.000
264	Jataha - Madhubani	26300.000	26400.000	100.000	20.000	20.000
265	Jataha - Madhubani	26400.000	26500.000	100.000	20.000	20.000



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Block Section/Yard	Chainage		Length Meter	Distance in meters from Centre Line	
		From	To		LHS	RHS
266	Jataha - Madhubani	26500.000	26600.000	100.000	20.000	20.000
267	Jataha - Madhubani	26600.000	26700.000	100.000	20.000	20.000
268	Jataha - Madhubani	26700.000	26800.000	100.000	20.000	20.000
269	Jataha - Madhubani	26800.000	26900.000	100.000	20.000	20.000
270	Jataha - Madhubani	26900.000	27000.000	100.000	20.000	20.000
271	Jataha - Madhubani	27000.000	27100.000	100.000	20.000	20.000
272	Jataha - Madhubani	27100.000	27200.000	100.000	20.000	20.000
273	Jataha - Madhubani	27200.000	27300.000	100.000	20.000	20.000
274	Jataha - Madhubani	27300.000	27400.000	100.000	20.000	20.000
275	Jataha - Madhubani	27400.000	27500.000	100.000	20.000	20.000
276	Jataha - Madhubani	27500.000	27600.000	100.000	20.000	20.000
277	Jataha - Madhubani	27600.000	27700.000	100.000	20.000	20.000
278	Madhubani Yard	27700.000	27800.000	100.000	40.000	60.000
279	Madhubani Yard	27800.000	27900.000	100.000	40.000	60.000
280	Madhubani Yard	27900.000	28000.000	100.000	40.000	60.000
281	Madhubani Yard	28000.000	28100.000	100.000	40.000	60.000
282	Madhubani Yard	28100.000	28200.000	100.000	40.000	60.000
283	Madhubani Yard	28200.000	28300.000	100.000	40.000	60.000
284	Madhubani Yard	28300.000	28400.000	100.000	40.000	60.000
285	Madhubani Yard	28400.000	28500.000	100.000	40.000	60.000
286	Madhubani Yard	28500.000	28600.000	100.000	40.000	60.000
287	Madhubani Yard	28600.000	28700.000	100.000	40.000	60.000
288	Madhubani Yard	28700.000	28800.000	100.000	40.000	60.000
289	Madhubani Yard	28800.000	28850.000	50.000	40.000	60.000
290	Madhubani Yard	28850.000	28900.000	50.000	40.000	75.000
291	Madhubani Yard	28900.000	29000.000	100.000	40.000	75.000
292	Madhubani Yard	29000.000	29100.000	100.000	40.000	75.000
293	Madhubani Yard	29100.000	29200.000	100.000	40.000	75.000
294	Madhubani	29200.000	29300.000	100.000	20.000	20.000
295	Madhubani	29300.000	29400.000	100.000	20.000	20.000

Note: The chainage of Centre line of existing Paniahwa station building is taken as 0+000.

For Electrification Work

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

Sl. No	From km to km	Length (m)	Width (m)	Date of Providing Right of way
1	2	3	4	5
For OHE work Paniahwa (Excl.) – Madhubani (Incl.)	0.350 to 29.400	-	-	Right of Way being 95% (ninety five percent) of the core land length and 90% (ninety percent) of non core land length of the project, under Clauses



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Sl. No	From km to km	Length (m)	Width (m)	Date of Providing Right of way
1	2	3	4	5
				4.1.3 read with Clauses 8.2 and 8.3 of the Agreement.
For Sub-Sectioning & Paralleling Post (a) Jataha	As per drawing	50	25	Right of Way being 95% (ninety five percent) of the core land length and 90% (ninety percent) of non core land length of the project, under Clauses 4.1.3 read with Clauses 8.2 and 8.3 of the Agreement.
Site for Service Buildings, Tower Wagon Sheds, Quarters	(a) OHE cum PSI Depot, Towe Wagon Shed at Madhubani Yard (b) Quarters location as per drawing and details.	-	-	Right of Way being 95% (ninety five percent) of the core land length and 90% (ninety percent) of non core land length of the project, under Clauses 4.1.3 read with Clauses 8.2 and 8.3 of the Agreement.



Annex - III
(Schedule-A)

Plan and Profile

The proposed alignment plan, L-sections, Engineering Scale Plans (ESPs), Signalling Interlocking Plans (SIPs) of the Railway Project Line are attached. This is based on survey conducted by the Authority. The Contractor shall verify alignment plan, L-sections, ESPs, SIPs for ensuring technical feasibility within the Right of Way boundaries. (Any deviation positive/negative from the enclosed Engineering Scale Plans, Approved Alignment plan, L section and Signal Interlocking Plan will be treated as Change of scope.)

In addition to the Alignment Plan, the Conceptuals Engineering Scale Plan (ESP) drawings are also included, whenever necessary.

The proposed sectioning arrangement of the Railway Electrification Project i.e. tentative General Power Supply diagram, Sectioning diagram is attached. The Contractor shall verify the same for ensuring technical feasibility within the Right of Way boundaries.

The tentative Signaling Interlocking Plans (SIPs) of the Railway Project are attached. This is based on survey conducted by the Authority. The Contractor shall verify Conceptual ESPs, SIPs for ensuring technical feasibility within the Right of Way boundaries.

- 1) The Contractor shall verify & revalidate all relevant factors which could have an impact on the Design and construction of the earthwork including but not limited to the topography, subsurface conditions, ground water levels, Temporary Works, dewatering, drainage, climatic conditions, availbililty of good earth, borrow pits, the availability or lack of access, working space, storage, accommodation, restrictions imposed by the existing Indian Railways Tracks, the proximity of adjoining structures and roads, the local regulations regarding the obstruction of public highways and any other limitations imposed by the site and its surroundings, for the satisfactory completion of Works meeting with performance requirements in the stipulated time.
- 2) It will be presumed that Contractor has taken note of all effects of these constraints on his construction operations to ensure on-time completion of the Works.
- 3) No claim by the Contractor on the grounds of lack of foresight or knowledge of the site conditions or any unknown parameters shall be considered.
- 4) The Permanent Works shall not infringe the Indian Railway schedule of dimensions and land boundary limits provided by Railways.
- 5) If the definitive design requires additional land over and above that already set out, the Contractor will inform the Engineer.



- 6) The Geotechnical Investigation data provided by the Authority shall be supplemented by verifications / additional investigations if considered necessary by the Contractor for development of his Technical Design at his own cost. No claim shall be entertained by the Authority in case the Contractor encounters the data different than that included during the verification/additional investigation or during actual execution of work.
- 7) The technical data provided by the Authority with **NIT (Notice Inviting Tender) of Bidding Document** such as L-Section/Plan and Profile, GAD of Bridges*, ESPs, SIPs, GAD of Station Buildings, GAD of Staff Quarters and other reference drawings mentioned in the draft EPC document are indicative and provided for guidance only.

The Contractor shall recheck, verify and validate the indicative L-Section/Plan and Profile, GAD of Bridges, ESPs, SIPs, GAD of Station Buildings, GAD of Staff Quarters and other reference drawings provided by the Authority of **Bidding Documents**, after conducting site investigation to suit the site conditions. Site Investigation should include but not limited to topographical survey, hydrological survey and geotechnical surveys. Any change on account of existing ground conditions/ground levels mentioned in L-Section/Alignment/ESPs shall not be considered as Change of Scope. For avoidance of doubt, it is clarified that the existing ground conditions/ground levels are to be validated by bidders before bid and hence no change on this account is payable.

The Contractor shall carry out surveys and investigations and shall develop best-fit designs and drawings for the Railway Project in conformity with the specifications and standards stipulated in the Agreement, within the Right of Way (ROW) boundaries set by the Authority.

***Note: Bidders are not allowed to modify the span arrangement and type of superstructure of Bridges.**

The relevant drawings are provided in the Enclosure as given below:

1. Enclosure-A: Yard Station Drawings

S.N.	Drawing Title	Drawing No.
1.	Engineering Scale Plan of Chhitauni	GML1-2025/Y-906263
2.	Engineering Scale Plan of Jataha	GML1-2025/Y-906265
3.	Engineering Scale Plan of Madhubani	GML1-2025/Y-906264

Tentative SIPs of Section Chhitauni-Jataha-Madhubani are as:

S. No.	Drawing Title	Drawing No.
1	CHHITAUTNI (ELECTRONIC INTERLOCKING)	SIGNAL INTERLOCKING PLAN SIP.NER.BSB.CTE.00
2	JATAHA	SIGNAL INTERLOCKING PLAN



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

	(ELECTRONIC INTERLOCKING)	SIP.NER.BSB.JATAHA.00
3	MADHUBANI (ELECTRONIC INTERLOCKING)	SIGNAL INTERLOCKING PLAN YY SIP.NER.BSB.MADHUBANI.00

2. Enclosure-B: Drawing of Bridges

2.1 : Important Bridges:

S.N.	Bridge No.	Proposed Location	Span Arrangement	Type of Super Structure
1.	N/A			

2.2 : Major Bridges

S.N.	Bridge No.	Proposed Location (Chainage/km)	Span Arrangement	Type of Structure	Reference RDSO Drawing No.
1	11	9258.318	3×12.2	PSC SLAB	RDSO/B-10271/R & RDSO/B-10271 & RDSO/B-10294 & RDSO/B-10255/2
2	14	10428.54	4×12.20	PSC SLAB	RDSO/B-10271/R & RDSO/B-10271 & RDSO/B-10294 & RDSO/B-10255/2
3	16	11276.68	3×12.20	PSC SLAB	RDSO/B-10271/R & RDSO/B-10271 & RDSO/B-10294 & RDSO/B-10255/2
4	19	12381.93	1×30.5	Composite Girder	RDSO/B-11754/R3 & B-11754/3R3
5	20	13397.267	1×30.5	Open Web Girder	RDSO/B-17161 & RDSO/B-17164 & CBS-0046 & CBS-0016
6	22	14246.934	1×45.7	Open Web Girder	RDSO/B-17181/R & RDSO/B-17181/19
7	24	14770.644	2×12.2	PSC SLAB	RDSO/B-10271/R & RDSO/B-10271
8	26	15390.331	2×12.2	PSC SLAB	RDSO/B-10271/R & RDSO/B-10271
9	28	16738.594	3×12.2	PSC SLAB	RDSO/B-10271/R & RDSO/B-10271
10	36	20325.4938	2×12.2	PSC SLAB	RDSO/B-10271/R & RDSO/B-10271 & RDSO/B-10294 & RDSO/B-10255/2
11	46	26462.7598	3×12.2	PSC SLAB	RDSO/B-10271/R & RDSO/B-10271 & RDSO/B-10294

Note: -The Major Bridges shall be designed and constructed in such a manner that, under no circumstances, the existing waterway of the water bodies is restricted or reduced.



2.3: Minor Bridges

S. N.	Bridge No.	Proposed Location (Chainage/km)	Superstructure	Dimension (m)		Barrel Length (m)	RDSO Drawing No.
				Span	Height		
1	2	4463.333	RCC BOX	1×2.0	2.0	13.174	RDSO/B-10155 & RDSO/B-10155/3
2	4	5532.885	RCC BOX	1×2.0	2.0	25.750	RDSO/B-10155 & RDSO/B-10155/3
3	6	6287.882	RCC BOX	1×2.0	2.0	23.150	RDSO/B-10155 & RDSO/B-10155/3
4	8	7386.284	RCC BOX	1×3.0	3.0	20.678	RDSO/B-10155 & RDSO/B-10155/5
5	13	9800.428	RCC BOX	1×3.0	3.0	18.226	RDSO/B-10152R & RDSO/B-10152/4R
6	17	12193.776	PSC SLAB	1×6.1	-	7.850	RDSO/B-10274 & RDSO/B-10294
7	29	17754.861	RCC BOX	1×3.0	3.0	17.026	RDSO/B-10152R & RDSO/B-10152/4R
8	31	18409.0682	PSC SLAB	1×9.15	-	-	RDSO/B-10272/R & RDSO/B-10294
9	34	19926.4675	PSC SLAB	1×9.15	-	-	RDSO/B-10272/R & RDSO/B-10294
10	41	23587.5007	RCC BOX	1×3.0	3.0	17.190	RDSO/B-10152R & RDSO/B-10152/4R
11	43	24129.5759	RCC BOX	1×3.0	3.0	19.994	RDSO/B-10155 & 10155/5

2.4 : RCC BOX/RUB/LHS

S. N.	Bridge No.	Proposed Location (Chainage/km)	Superstructure	Span (m)		Barrel Length (m)	RDSO Drawing No.
				Span	Height		
1	3	4677.1981	RCC BOX	1×5.5	4.0	7.850	RS/D/B-10152/R & RS/D/B-10152/1R
2	5	5770.722	RCC BOX	1×5.5	4.0	12.094	RDSO/B-10152/R & RDSO/B-10152/3R
3	7	7063.2445	RCC BOX	1×5.5	4.0	8.000	RS/D/B-10155 & RS/D/B-10155/1
4	9	7768.415	RCC BOX	1×5.5	4.0	12.106	RDSO/B-10152/R & RDSO/B-10152/3R
5	10	9053.979	RCC BOX	1×5.5	4.0	8.750	RDSO/B-10152/R & RDSO/B-10152/2R
6	12	9673.278	RCC BOX	1×6.0	4.0	10.104	RDSO/B-10161/1R & RDSO/B-10161/R
7	15	10860.071	RCC BOX	1×6.0	4.0	9.238	RS/D/B-10162/R & RS/D/B-10162/1/R & RDSO/M-0001
8	18	12209.05	RCC BOX	2×4.0	4.5	8.750	RDSO/B-10158 & RDSO/B-10158/2A & RDSO/B-10159 & RDSO/M-0001



EPC tender for "Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway".

S.	Bridge	Proposed	Superstru	Span (m)		Barrel	RDSO Drawing
9	21	13481.538	RCC BOX	2×4.0	4.5	8.750	RDSO/B-10158 & RDSO/B-10158/2 & RDSO/M-0001 & RDSO/B-10159
10	23	14288.305	RCC BOX	1×6.0	4.0	9.064	RS/D/B-10162/R & RS/D/B-10162/1/R
11	25	14765.33	RCC BOX	1×6.0	4.0	14.884	RS/D/B-10162/R & RS/D/B-10162/1/R
12	27	15876.718	RCC BOX	1×6.0	4.0	15.263	RS/D/B-10162/R & RS/D/B-10162/1/R
13	30	17798.839	RCC BOX	1×5.5	4.0	13.318	RDSO/B-10152/R & RDSO/B-10152/3R
14	32	19086.663	RCC BOX	1×5.5	4.0	7.850	RDSO/B-10152/R & RDSO/B-10152/3R
15	33	19378.290	RCC BOX	1×5.5	4.0	7.850	RS/D/B-10152/R & RS/D/B-10152/1R
16	35	20029.699	RCC BOX	1×5.5	4.0	8.000	RS/D/B-10155 & RS/D/B-10155/1 & RDSO/M-0001 & RDSO/B-10159
17	37	20800.055	RCC BOX	1×6.0	4.0	9.064	RS/D/B-10162/R & RS/D/B-10162/1R & RDSO/M-0001 & RDSO/B-10159
18	38	21832.2495	RCC BOX	1×6.0	4.0	17.314	RS/D/B-10162/R & RS/D/B-10162/1R & RDSO/M-0001 & RDSO/B-10159
19	39	22215.7092	RCC BOX	1×6.0	4.0	10.104	RS/D/B-10162/R & RS/D/B-10162/1R & RDSO/M-0001 & RDSO/B-10159
20	40	22716.188	RCC BOX	1×6.0	4.0	9.238	RS/D/B-10162/R & RS/D/B-10162/1R & RDSO/M-0001 & RDSO/B-10159
21	42	23811.672	RCC BOX	1×6.0	4.0	9.200	RDSO/B-10162/R & RDSO/B-10162/1R & RDSO/B-10159 & RDSO/M-0001
22	44	25037.867	RCC BOX	1×5.5	4.0	8.750	RDSO/B-10155 & RDSO/B-10155/1 & RDSO/B-10159 & RDSO/M-0001
23	45	26000.790	RCC BOX	1×5.5	4.0	7.850	RS/D/B-10152/R & RS/D/B-10152/1R & RDSO/B-10159 & RDSO/M-0001
24	47	26581.626	RCC BOX	1×5.5	4.0	7.850	RS/D/B-10152/R & RS/D/B-10152/1R & RDSO/B-10159 & RDSO/M-0001
25	48	29013.4025	RCC BOX	1×6.0	4.0	10.104	RDSO/B-10162/1R & RDSO/B-10162/R & RDSO/B-10161 & RDSO/M-0001
26	49	29368.796	RCC BOX	1×6.0	4.0	8.466	RD/D/B-10162/R & RD/D/B-10162/1R &



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S.	Bridge	Proposed	Superstru	Span (m)	Barrel	RDSO Drawing
						RDSO/M-0001 & RDSO/B-10159

2.5: ROB (Road Over Bridge)

S.N.	Bridge No.	Proposed Location (Chainage/km)	Span Arrangement	Type of Structure	Reference RDSO Drawing No.
			Nil		

2.6: GAD for Passenger Subways

SI. No.	Location/Station	Reference/Drawing
		Nil

2.7: GAD for FOBs

SI. No.	Location/Station	Reference/Drawing
1	As per ESP / Chhitauni	RDSO/B-10405

The list of bridges mentioned above in Clauses 2.1, 2.2, 2.3, 2.4, 2.5, 2.6 and 2.7 is only indicative. The Contractor shall carry out detailed surveys and construct additional bridges wherever required, in addition to above list. There shall be no reduction in the total span of any bridge specified in the above list, and standard RDSO spans shall be used.

3. Enclosure-C: Longitudinal Section and Plan & Profile Drawing:

S.N.	Drawing Title	Drawing No.
1.	Working Plan & Section from Km. 0.000 to 3.120	GML1-2025/1-906175
2.	Working Plan & Section from Km. 3.120 to 8.000	GML1-2025/1-903147
3.	Working Plan & Section from Km. 8.000 to 13.000	GML1-2025/1-903148
4.	Working Plan & Section from Km. 13.000 to 18.000	GML1-2025/1-903149
5.	Working Plan & Section from Km. 18.000 to 23.000	GML1-2025/1-903150
6.	Working Plan & Section from Km. 23.000 to 28.000	GML1-2025/1-903151
7.	Working Plan & Section from Km. 28.000 to 29.400	GML1-2025/1-903152
Note: In case of any deviation in bridge details between the details given in the EPC document and the attached L-Section, the bridge details mentioned in the EPC document and the attached approved GADs shall be followed.		

4. Enclosure-D: Standard RDSO Drawings (Drawing List for Reference only, Drawings not enclosed in the enclosures)

S. N.	Location/Station	Reference/Drawing
1	RDSO/B-1484/5	25t loading-2008 temporary christ church cribs key diagram and plan abutment



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S. N.	Location/Station	Reference/Drawing
2	RDSO/B-10272/R	9.15m 25t loading 2 units post tensioned concrete psc slabs
3	RDSO/B-10271	12.00m 25t loading 2 units post tensioned concrete psc slabs
4	RDSO/BA-10274	6.10m 25t loading 2 units post tensioned concrete psc slabs
5	RDSO/B- 10152R TO 10152/9R	25 T loading Single box culvert structural design
6	RDSO/B-10158 TO 10158/2A	25 t Double box culvert for double line track
7	RDSO/M-00004, 00005,00008	RCC box culvert & limited height subway
8	RDSO/B-10160	25t construction of rub/subway using combination of cut, open and push the single long barrel rcc box
9	CBS -0016	Inspection platform & pedestal for bearing
10	RDSO/B-10271/R & RDSO/B-10271 & RDSO/B-10294 & RDSO/B-10255/2	PSC Slab 12.2
11	RDSO/B-11754/R3 & B-11754/3R3	Composite Girder 30.5m
12	RDSO/B-17161 & RDSO/B-17164 & CBS-0046 & CBS-0016	Open Web Girder 30.5m
13	RDSO/B-17181/R & RDSO/B-17181/19	Open Web Girder 45m

The above list is indicative and not exhaustive. Any other available standard drawing as required shall be made available and the contractor can adopt the same with due approval from the Authority's Engineer.

5. Enclosure-E: Civil work-related Drawings

S. N.	Drawing Title	Drawing No.
1.	Staff quarter type-II (Double Storey)	GML1-2014/T-911008
2.	Staff quarter type-III	GML1-2015/T-907005
3.	High level Platform wall	GML1-2014/Z-903003
4.	Bitumen road section	CE's Type Plan No. T/5/71
5.	Concrete road section/Concrete Pavementfor approach road for goods shed	GML1-2010/T901001
6.	Pay and Use Toilet	GML1-2003/T-901001
7.	Trolley refuge	GML1-2020/T-912003



NOTE:

1. The above list is indicative and not exhaustive. Any other standard drawing as required shall be made available and the contractor can adopt the same with due approval from the Authority's Engineer.
2. If any drawing such as river/nallah training wing wall, return wall, toe wall, which is required for execution of this project but not available with the railway, the EPC contractor shall prepare the same as per approval of Authority.

6. Enclosure-F: Electrical works related Drawings

S. N.	Drawing Title	Drawing No.
1.	General Power Supply diagram: Tentative GPSD are enclosed in Tender Document. Final GPSD to be submitted by the Contractor.	EL/CON/GKP/GPST/PNYA-MBI
2.	Sectioning diagram: Tentative Sectioning diagramen closed in Tender Document. Final Sectioning diagram to be submitted by the Contractor.	EL/CON/GKP/SECTIONING/PNY A-MBI

Railway Electrification Reference Drawings and Specification

The above list is indicative and not exhaustive. Any other standard drawing which are required shall be prepared and submitted as per the standard practice followed and as per Scheme for Approval of Electrical Drawings at Division/HQ Level for the approval of Competent Authority (Ref: RB Letter No. 2015/RE/161/22).

Apart from above, the standard RDSO/Rly. Bd. Reference drawing to be followed for execution of work which have been given under Schedule-D (SPECIFICATIONS AND STANDARDS) and specified in the scope of work at various paragraphs of the standard paper.

All references to drawings, charts, schedules, specifications, IS codes given in this tender document shall be taken to be the latest versions including all amendments up to the date. All other items not covered under the Drawing/Specification shall be referred to as per relevant IS and Railway practice in force.

7. Signal & Telecommunication Reference Drawings and Specification

The following table gives a list of reference drawings to be followed for execution works. Any other drawings which are required shall be prepared and submitted by the contractor as per the standard practice followed.

All references to drawings, charts, schedules, specifications, IS given in this Annexure or elsewhere in the tender document shall be taken to be the latest versions including all amendments up to the date. All other items not covered under



the Drawing/Specification shall be referred to as per relevant IS and Railway practice in force.

Technical Specification of Signaling and Telecom materials:

SN	Description	Minimum Specification with Latest Amendments/Drawing/Specification
1.	Relay, non AC immune, plug-in type, style QN1, DC neutral line, 24V DC, 8F/8B contacts. Front & back contacts metal to carbon,	BRS 930, IRS:S-34 & IRS:S-23 or latest. (as applicable)
2.	Relay, AC immune, plug-in type, style QNA1, DC neutral line, 24V DC, 8F/8B contacts. Front & back contacts metal to carbon,	BRS 931A, IRS:S-34 , IRS:S-23 & IRS:S-60. (as applicable) or latest.
3.	Universal Plug-in type AC Lamp Proving Relay (Metal-to-Carbon Contact) suitable for AC lit LED signals 110V AC,	RDSO specification no. STS/E/Relays/AC lit LED signal/092002 or latest.
4.	Fail-safe Electronic flasher device, 60 flashes per minute workable on 24V DC.	RDSO Specification No. RDSO/ SPN/ 173/ 2002 or with latest amendment/specification
5.	Supply of RTU with 230V/24V DC Charger & 12V DC 42AH mono block cells.	IRS-S-99/2006 or latest
6.	Supply of isolation transformer 600:470 Ohms	IRS: TC/76-2000 with amendment No-1 or latest
7.	16/0.2mm size tinned flexible single core indoor wire, PVC coated in different colors.	IRS: S- 76/89 Amend. No. 2 or with latest amendment/specification
8.	ARA terminal block 6 way, PBT.	IRS:S 75/2006(Rev-2) Drg. No.SA23756 or latest.
9.	Disconnect Terminal block for Four conductor with screw less Cage Clamp type/sliding switch disconnect, for each conductor size up to 2.5 sq.mm.	RDSO Specification No. RDSO/SPN/189/2004 version 1.2
10.	Battery charger 230V AC/110V DC, 50 amp,	IRS:S-86/2000 with latest amendments
11.	Fuse Block Made of PBT/Polycarbonate.	IRS S- 75/2006 or latest
12.	Non decorating type low voltage cylindrical head 2A.	IRS/S/78/92 with latest amendments.
13.	Fuse auto changeover system for railway Signaling.	RDSO/SPN/209/2012 Rev 2.0 or latest
14.	PVC insulated single core multi strand flexible Cu cable 6 Sq mm	IRS 76/89 or latest
15.	PVC insulated single core multi strand flexible Cu cable 10 Sq mm.	IRS 76/89 or as per IS-694/1990 or latest.
16.	PVC insulated single core multi strand 16 Sq.mm Cu conductor flexible cable.	IS-694/1990 or latest.
17.	A set of complete Earthing and Bonding system	RDSO/SPN/197, Version 1.0 or latest,
18.	PVC insulated multi strand 35 Sq. mm. Cu Cable	IS-694/1990 or latest.
19.	Copper Tape 25x3 mm	RDSO Drawing SDO/RDSO/E&B/001 or latest.
20.	CLS Base, Tubular steel post, Ladder assembly complete with back guard platform & ladder base Anchore bolts (4Nos) with nuts and	Drawing No. CSTE/CON1 2000(SK)



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

SN	Description	Minimum Specification with Latest Amendments/Drawing/Specification
	washers	
21.	Three Aspect signal unit in FRP body without lense & transformer	RDSO/SPN/194/2006, Version-1 or latest
22.	Two Aspect signal unit FRP body without lense & transformer	RDSO/SPN/194/2006 or latest.
23.	110V AC Main LED Signal with integrated current regulator retro fittable in existing CLS housing and compatible with AC LED ECR (Red, Yellow, Green aspect)	RDSO specification RDSO/SPN/199/2010 Rev 1.0 or latest. Red Aspect
24.	PVC Insulated Armoured, Unscreened, Underground Railway Signaling Cable 12 core x 1.5 sqmm	IRS:S-63/2014(Rev.4.0) with latest Amendment/specification.
25.	Cable Power 2 core 25 sq. mm Aluminium Conductor PVC insulated Armoured Unscreened, Under Ground cable.	IRS:S-63/2014 (Amdt-1) or latest & IS:1554(Part-1) or latest.
26.	6 QUAD cable 0.9 mm dia Copper conductor Polyethylene insulated Aluminium screened armoured under ground jelly filled cable	IRS:TC-30/2005(ver.1) with Amendment 5 or latest
27.	Thermoshrink cable Jointing Kit for 6 QUAD Jelly filled cable.	IRS:TC-77/2012, Rev.3, Amdt.-3
28.	Apparatus case (large)	RDSO drg. No. RDSO /S/11500 or latest.
29.	Apparatus case half.	RDSO Drg. No. RDSO/S/11507 with latest amen dt
30.	Hylam Sheet, resin bonded, 10mm thick, grade-P3,	IS:2036 of 1974.
31.	Double walled corrugated (DWC) Pipe	TEC specifications GR/DWC-34/01, IS 14930 part-II
32.	G.I. Pipes with thread collars of 80mm nominal bore ,medium grade	specification IS:1239 medium grade
33.	UFSBI	IRS Spec. No IRS:S-104/2012 Ver.0 (Latest Amendments)
34.	Active lightning arrestor of Class A for building protection	Standard NFC 17-102
35.	CO2 type (ABC) fire of capacity 4.5 Kg having ISI mark.	IS- 2878
36.	SMPS based Mini IPS system	No.RDSO/SPN/165/2012 (ver.3.0) , Annexure II-G and Drg. No.SDO/IPS/IBS/008
37.	Solar photo voltaic system for IBS	IRs-S-84/92 (Amdt-2) or latest
38.	Class 'B' , Class 'C' and Class D SPD	RDSO/SPN/ 144/2004 or latest.
39.	48 FIBRE ARMOURED OPTIC FIBRE CABLE	RDSO/ SPN /TC /110/2020(Rev.0.0) or latest
40.	Optical Fiber Cable Joint enclosure	TC 81-2000 (Part-A) or latest.
41.	Fiber Distribution Management System	RDSO/SPN/TC/37/2020 Rev.4.0 or latest.
42.	Permanently lubricated HDPE Pipe	RDSO/SPN/TC/45/2013, Rev.2.0, Amdt. 2 or latest
43.	Telephone switch board cable 0.5 sq mm copper conductor	ITD specification G/WIR-06/02, May 94
44.	Medium Grade G.I. Pipes	IS:1239
45.	QUAD CABLE 6 Quad jelly filled	RDSO spec. No. IRS:TC 30/2005(ver.1) with Amendment No. 1 to 5.
46.	RE In forced Thermo shrinking Jointing Kit for	IRS:TC- 77/2012, (Rev.3), Amdt.-1, 2 & 3 or



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

SN	Description	Minimum Specification with Latest Amendments/Drawing/Specification
	4/6 quad jelly field cable for derivation 2T & straight through joints	latest.
47.	VF Transformer for QUAD	IRS:TC-76-2000 or latest.
48.	Multi strand copper cable for Power wiring	IS:694/2010 or latest.
49.	LAN Switch	RDSO/SPN/TC/83/2020,Rev.2.0 or latest.
50.	Optical Patch Cord and Pigtails	RDSO/SPN/TC/69/2007 or latest.
51.	Joint enclosure for Armoured Optical fiber cable	RDSO/SPN/TC/68/2014, Rev. 1, Amdt.1 or latest.
52.	Cement Concrete foundation for Color Light Main Signal Post	Drg. No. CSTE/CON/SK/05/99 or latest.
53.	Cement Concrete foundation for Apparatus Case (Full)	CSTE's Drg. No. CSTE/CON/BG/SK/82/2, Galvanized Anchor bolts & nuts (also referred to as foundation bolts) conforming to IRS Drg. No. SA-116A/M
54.	Electronic Interlocking System.	RDSO/SPN/192/2019 with latest amendment.
55.	PVC insulated armored unscreened, under ground Railway Signaling cable.	IRS: S 63/2014 (Rev 4.0) or latest.
56.	Double walled corrugated (DWC) pipes.	IS-14930, part-II or latest.
57.	Polyolefin Cable Channel.	DIN 53438 part-II or latest.
58.	Microprocessor based data logger with 512 /1024 Digital & 32 Analog Inputs.	IRS : S 99/2006 (amendment 3) with latest amendments.
59.	SMPS Based Integrated Power Supply System.	RDSO/SPN/165/2012 with latest amendment.
60.	Block Proving with Axle Counter System.	IRS:S-105/2012 (Ver.0) or latest.
61.	Universal Fail-Safe Block Interface System.	RDSO/SPN/147/2005, IRS:S-104/2012 (Ver-0) or latest
62.	SM's Panel/Block Panel, for Single Line.	RDSO Drg. No. RDSO/S/32019 or latest amendment.
63.	Block Telephone.	RDSO/SPN/191/2006 or latest.
64.	Automatic media changeover.	RDSO/SPN/147/2005, IRS:S-104/2012 with amendment 1 or latest.
65.	High Availability Single Section Digital Axle Counter (HASSDAC) System.	RDSO/SPN/177/2012 (Ver.3) or latest.
66.	FRP CLS unit 2 aspect, 3 aspects, 4 aspect.	RDSO Drawing No. SA 23003/A/M, conforming to specification: IRS: S- 26/64 or latest.
67.	Main Signal Post 140 mm outer dia 3.5/ 4.5 Meter Length.	IRS S 6/81 with latest amendments.
68.	Non-metallic FRP 1/2/3/4 way Junction type Route Indicator.	RDSO/SPN/ 194/2006 Ver. 1 or Latest and Drawing as per RDSO No. SA23401 with latest amendments.
69.	FRP Calling-on Unit.	RDSO Drawing Nos 24351 (Adv.) Alt1 or latest.
70.	FRP Shunt signal Dependent Type.	RDSO/SPN/194/2006 Ver. 2.0 or Latest.
70.	FRP Shunt signal Independent Type.	RDSO/SPN/194/2006 Ver. 2.0 or Latest.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

SN	Description	Minimum Specification with Latest Amendments/Drawing/Specification
72.	LED Signal Lighting Unit for Main Signals.	RDSO/SPN/199/2010 (Rev 1.0) or Latest.
73.	LED Signal Lighting Unit for Route Indicator/ Calling On signals/ Shunt signals.	RDSO/SPN/153/2011 (Rev 4.1) or Latest.
74.	Electric Point Machine.	IRS:S 24/2002 (amendment 1) or latest.
75.	Ground Connection Set.	Drawing. S/3361/62/63 (for IRS Point machine) with latest amendments.
76.	Apparatus Case Single (Full) Case &Half Case.	DRG No. RE/S&T/ALD/SK/219/82 &221/82 with latest amendment.
77.	Electrically Operated Lifting Barrier Set	RDSO/SPN/208/2012 Ver. 2.0 or latest.
78.	LC Gate Telephone System.	RDSO/SPN/TC-51/2009 Revision-1.0 or latest.
79.	Sliding Boom Gate.	Signal workshop/hwhs drawing no. BSA/29/730. BSA/29/731& BSA/29/737 with latest amendment.
80.	Maintenance free Earthing.	RDSO/SPN/197/2008 and Drawing No. SDO/RDSO /E&D /001 & 002 or latest.
81.	Automatic Fire Detection system & Alarm system (AFDA)	RDSO/SPN/217/2016 version no. 1 or latest.
82.	Earth Leakage Detector.	RDSO/SPN/256/2002 or latest amendment.
83.	Thermo shrink jointing kit	IRS : TC77-2012 (Rev-3) with Amdt.1 & 2 latest amendments.
84.	SMPS based Telecom Integrated Power Supply System (TIPSS).	RDSO/SPN/TC/102-2013, Ver. 1.0 or latest.

Note: -

1. All works will be executed as per latest IRSEM, IR Telecom Manual, Railway Board/RDSO Guidelines, NER practices and above given specifications and drawings. If no such guidelines are available or if there are any deviations then the prior approval of the Railway Authority will be mandatory before installation or execution of works.
2. Items where RDSO approved sources are available should be procured from RDSO approved sources and should be inspected by RDSO as per the Inspection Policy of RDSO.
3. Inspection certificates from the RDSO/RITES to be submitted to authority before supply & Installation.
4. Items with specifications not mentioned or any discrepancy/deviation in specification of any items should be Supplied and installed only after approval of the Railway Authority.



Annex - IV
(Schedule-A)

Environment Clearances and Forest Clearances

- 1. Environment clearances : Not Required.**

- 2. Forest clearances : Not Required.**



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

SCHEDULE - B

(See Clause 2.1)

Development of the Railway Project

Development of the Railway Project shall include design and construction of the Railway Project as described in Annex 1 to this Schedule-B and in Schedule-C.



Annex - I (Schedule-B)

Description of Railway Project

Description of Railway Project

The project consists of laying a New Broad Gauge single line between Chainage 0+350 (Km 0.350) Paniahwa (Excluding) & Chainage 29+400 (Km 29.400) Madhubani (Including) having a length of 29.050 km section between Paniahwa (PNYA) – Madhubani in connection with Paniahwa (PNYA) – Chhitauni (CTE) – Tamkuhi Road (TOI) New Broad Gauge Railway Line Project of North Eastern Railway.

The proposed alignment of this project “Construction of New BG single line between Chainage 0+350 (Km 0.350) Paniahwa (Excluding) & Chainage 29+400 (Km 29.400) Madhubani (Including) having a length of 29.050 km”. It is intended to design & construct the single BG line at a maximum train speed of 160 km/h with an axle load of 25 Tonnes. Formation, track and bridge structures are to be provided for 25 Tonne axle load.

The scope of the works to be performed under the contract (herein after referred to as “the scope of work”) shall comprise of Design & Construction of Civil, Building, Electrical, Signaling and Telecommunication, Electrification on 2x25 kV system, General Electrical works & Track works for the Project “Construction of New BG single line between Chainage 0+350 (Km 0.350) (Excluding) & Chainage 29+400 (Km 29.400) Madhubani (Including) having a length of 29.050 km including Electrification and Signaling works” which entails construction of **11 (Eleven) Minor Bridges** (*Out of 11 minor bridgs construction of RCC box barrels of Bridge Nos. 4 and 6 have been completed. Balance works of bridge no.4 & 6 are to be executed*), construction of **11 (Eleven) Major Bridges**, and construction of **26 (Twenty Six) Road Under Bridges** as indicated in para 4.7, Annexure-I) including approaches. Design, Supply, Installation, Testing & Commissioning of Electronic Interlocking at Chhitauni, Jataha and Madhubani Station along with associated works in adjoining section and provision of dual detection with Axle Counter (HASSDAC & MASDAC) in connection with new line work from Paniahwa to Madhubani Section of North Eastern Railway as per RDSO/SPN/192/2019 latest version.

Scope of work shall also include any associated works relating to manufacturing, supply, installation, testing & commissioning for Single Line Railway capable of operating at a speed of 160 km/h involving design & construction of formation in embankments/cuttings, bridges, structures, buildings including station buildings, service buildings, ballast on formation, track works, integration with Indian Railway system including testing & commissioning on design build all complete. The detailed description of scope of works is provided in the Schedule. All the chainage lengths as indicated below are indicative & approximate.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Station	Centreline of Station (Km)	Centreline of Station (Chainage)
1	Paniahwa (excluding)	0.000	0000
2	Chhitauni	3.117	3117
3	Jataha	16.100	16100
4	Madhubani	28.350	28350

Authority has carried out the Verification Survey of FLS Drawings information for the entire stretch of this project from Paniahwa to Madhubani by means of DGPS Survey and Long Section Survey with levels connected to GTS BMs.

The site of the Railway comprises the section commencing from Chainage 0+350 (Km 0.350) Paniahwa (Excl) & Chainage 29+400 (Km 29.400) Madhubani (incl.) having a length of 29.050 km section Paniahwa- Madhubani in connection with Paniahwa – Chhitauni – Tamkuhi Road New BG Railway Line Project of North Eastern Railway.

The land and other structures comprising the site are described below:

Features	Description
Length of the line (km)	29.050
Number of proposed Stations	3 Nos. (Crossing Station)
Number of proposed Station Buildings	3 Nos. (Chhitauni- 1 No., Jataha- 1 No. and Madhubani- 1 No.)
Staff Quarters	<ul style="list-style-type: none"> Chhitauni (Type-II- 7 units and Type-III- 3 units). Jataha (Type-II- 10 units and Type-III- 4 units). Madhubani (Type-II- 10 units and Type-III- 4 units).
Ruling Gradient proposed	1 in 300
Gauge	1676mm (Broad Gauge)
Maximum Degree of Curvature	3.25°
Height of Bank	Upto 7.643 m
Depth of Cutting	-
Bridges	-
(a) Major Bridges	11 Nos.
(b) Minor Bridges	11 Nos.
(c) Road Over Bridges	-
(d) Road Under Bridges	26 Nos.
(e) Foot Over Bridge	1 No.



Features	Description
(f) Subways	-
(g) Level crossing gates	-

The data and information related to L-section/ Geo technical data provided are indicative and for guidance only. These should be rechecked, verified and modified by conducting site investigation to suit the site conditions. Site Investigation should include but not limited to topographical survey, hydrological survey and geotechnical surveys. Any change on account of existing ground conditions/ground levels mentioned in L-Section/Alignment/ESPs shall not be considered as Change of Scope. For avoidance of doubt, it is clarified that the existing ground conditions/ground levels are to be validated by bidders before bid and hence no change on this account is payable.

The scope of work includes without limitation, the design, construction and removal of any Temporary Works and diversions of utility services both of Railways and local authorities as defined in agreement. In addition, the Contractor shall undertake the rectification of defects happening in the Permanent Works arising due to new line work to the standards as approved by Authority. Certain work may require condonation of Commissioner of Railway Safety (CRS) or Railway Board. Authority's Engineer shall process the proposal before execution of such works is taken up by the Contractor. Contractor shall intimate the Engineer of the requirement of such sanction well in advance but not later than one month before the work is planned to be taken up. Contractor shall assist Authority Engineer in preparation of all necessary documents related to CRS sanction. These works shall generally include bridge construction, Yard work, Girder launching activities. All Site investigations, Geo-technical surveys, hydrological survey, alignment finalization, bridge planning, bore holes, signaling, communication, ancillary works, record keeping, material testing, inspection reports shall form part of scope of Works for successful completion of Permanent Works.

1. Construction of Civil and Track Works

Prior to the Alignment verification and reviews of the various Reference Drawings by the Contractor, the Contractor shall carry out validation of the data as provided by the Authority and any additional surveys if considered necessary by the Contractor.

Validation of the data and any additional surveys as considered necessary by the Contractor is particularly important in this Contract which imposes on the Contractor a single point responsibility for the whole design and construction of the Works.

The Contractor shall plan and programme those validation and additional surveys if considered necessary and investigations required to commence the design of Works and develop them to the Survey Plan and Programme.

The Contractor shall summarize the results of Validation of Data and Additional Survey including all the site surveys and investigations in to



different reports which shall form part of the Survey Report, and shall be submitted to the Authority’s Engineer for his consent. The Contractor shall continue to be solely responsible for the accuracy and entirety of all the site surveys and investigations including Traverse Survey, Topographic Survey, Centre Line Survey and Geotechnical Investigations through out the Contract. Any 'Notice of No Objection' from Authority’s Engineer does not absolve the Contractor from his responsibility for accurately designing Alignment and setting out the Works within the available Right of Way.

Conceptual Method Statement and Sequence of Working (Working Methodology) in connection with the New Line Project between Paniahwa-Madhubani Section. The method statement and sequence of working given here is indicative and for the guidance of the tenderer only. The various activities, but not limited to, involved in execution of the project are as under:

(A) GENERAL WORKS

- (a) Mobilization at work site
- (b) Taking over the Land and work site
- (c) Detailed survey
- (d) Soil investigations & collection of other data
- (e) Design of Structures
- (f) Leading of Permanent Way (P-Way) material
- (g) Execution of construction works at site
- (h) Safety at Work Site

(B) CIVIL WORKS

- (a) Dismantling of existing Structure and track as per requirement and instruction from Authority Engineer.
- (b) Construction of formation (Earthwork and blanketing)
- (c) Construction of Minor Bridges and Major Bridges.
- (d) Construction of earthwork and transition systems in approaches to Bridges.
- (e) Construction of Limited Height Subway (LHSs)/Road under Bridge (RUBs)
- (f) Ultrasonic non-destructive testing of all types of bridges and structures as per requirement.
- (g) Construction of New Building/Structures
- (h) BG Track laying & linking in Block Section and Yard with Commissioning
- (i) Preparation of documents (TMS/IR-CAT) required for handing over the constructed section to open line engineering for running of passenger trains after Commissioning.
- (j) Maintenance of Constructed structures in Block Section till handing over to Open Line Engineering.
- (k) Other miscellaneous civil works
- (l) Construction of TSS/BSP/SSP control building, earth filling along with connecting roads, TW shed, OHE cum PSI depot.



(m) 03 Rounds Tamping of Plan Track & Turnout.

1.1 Operational Requirements

- 1.1.1 The Permanent Way shall be [single line] and designed to permit the Authority to operate satisfactorily at a maximum design speed of 160 km/h. All the bridges and formation shall be constructed for 25T-2008 loading standard. Track shall be constructed for an axle load of 25T. [The Laying of track to be done by NTC, if Project length is 100 Km or more.] In case a particular stretch/es is not suitable for NTC working, the Authority Engineer may permit track laying without NTC.

1.2 Alignment

- 1.2.1 The alignment of the Railway Project shall be as per the alignment plans given in Schedule A, Annex III. The Contractor is required to review and revalidate Engineering Scale Plans, Alignment & L section, SIPs for technical feasibility. The Alignment Drawings enclosed in the Reference Drawings are indicative and the Contractor shall be responsible for verifying their correctness and modifying them in compliance with the Design Criteria stipulated in the Design Standards of Schedule-D. The Contractor is required to review and revalidate Conceptual/Approved Engineering Scale Plans, Conceptual/Approved Alignment & L sections, SIPs for technical feasibility with respect to his own design. The Contractor is permitted to modify the plan and profile so as to get the best fit designed alignment of the railway project within the Right of Way boundaries set by the Authority.
- 1.2.2 The Contractor shall design the horizontal and vertical Alignment as per the Design Criteria specified in the Design Standards and within the available Right of Ways giving due consideration to the various obligatory points e.g. existing Bridges, Level Crossings, ROBs.

The Contractor shall ensure that the Alignment is located adequately within the Right of Way as indicated in the Alignment Drawings. If not adequately aligned, then the Contractor shall notify the Authority's Engineer of the conflicts including descriptions on the issue and modify the same to ensure that there is no conflict with the Right of Way and in compliance with the Design Criteria as stipulated in the Design Standards. The Contractor shall submit the revised Alignment Drawings (if required) to the Authority's Engineer for his review and consent of the Authority.

The Contractor shall develop the Alignment Plan and Profile Drawings in respect of the Alignment supplemented by the data derived from the validation of data and additional Topographic Survey and submit to the Authority's Engineer. The Authority's Engineer shall seek the approval of the Authority before communicating the Notice of No Objection of the Alignment Plan and Profile.

- 1.2.3 Upon Notice of No Objection to the Alignment Plan and Profile Drawings (collectively called 'Alignment Drawings') by the Authority's Engineer, the



Contractor shall immediately carry out the Centre Line Survey and staking of the Alignment at Site based on the Railways Benchmarks meeting all the requirements. The Centre Line Survey shall include ROW verification / staking and Horizontal Alignment staking.

1.3 Geometric design and general features

- 1.3.1 Geometric design, gradients, curves and all other general features of the Railway Project shall be in accordance with provisions of the Indian Railway Permanent Way Manual.
- 1.3.2 The formation level at various chainages along the alignment is indicated in the project sheets. These shall be verified and corrected by the Contractor in the final alignment design in conformity with the Specification and Standards specified in the Permanent Way Manual.
- 1.3.3 The ruling gradient of the section on the main line shall be 1 in 300 compensated. The alignment shall be designed by the Contractor to avoid frequent changes of gradient. As a matter of good engineering practice, the gradient should be maintained for a minimum of one train length i.e., approx. 750 m. In case of approaches to yard, major bridges, Level Xing gates and othersuch obligatory locations, the gradient shall be governed by requirement to maintain the pre defined levels and contractor shall provide gradient flatter than 1 in 300 as per requirement and good Construction practices. Wherever modification is proposed with respect to the alignment provided in the tender document all parameters like Ruling gradient, curvature, free Board, vertical clearance of bridges shall be notified while seeking approval of Authority's Engineer.
- 1.3.4 **Released Material-** The track, structure, buildings and other properties which are disturbed or dismantled the released bought out material shall be the property of Authority. Such materials of all kind and sort shall be transported and handed over in depot of the nominated stock holder by the Contractor as per the direction of Authority in charge. Contractor shall be fully responsible for safe guarding of such material while it is in its custody, till the time it is handed over to the stock holder.
- 1.3.5 In case of planned dismantling of any existing asset as a part of the project, the detailed plan and procedure for the dismantling activity with possible repercussions and disposal of released material and other relevant details, shall be submitted by the Contractor. Such work shall be taken up only after the approval of the Authority. Dismantling of buildings as per the agreed and approved dismantling plan and disposing off the released material of these buildings to stockholder/outside railway boundary are part of the scope of this contract.
- 1.3.6 **Security of Material-** The Contractor shall be responsible for the security of the site forthe entire period during which the site is in his possession. Notices shall be displayed at various prominent locations around the site, to warn the public of the dangers of entering the Site. During the progress of the work, the Contractor shall maintain such additional security patrols over the areas of Works as may be necessary to protect its own and its sub-contractor's



work and equipment and shall co-ordinate and plan the security of the work under this Contract as well as the work of others having access to and across the Site and the Works. The Contractor shall liaise with the sub-contractors and the contractors responsible for the adjacent and other interfacing contracts and ensure that co-ordinated security procedures are operated (in particular with respect to vehicles permitted to pass through the site and/or the adjacent sites in latter periods of the Contract).

- 1.3.7 **Safe Working/Safety at work site-** The Contractor shall be fully responsible for ensuring the safety of trains operating on the existing track in all respects and shall strictly comply with the safety instructions and guidelines issued by the Railways for “Safety at Worksite.”
- 1.3.8 **Earthwork & Blanketing:** Earth work in the formation shall be designed according to the type of existing soil and to be used for making embankments. Soil used for construction of embankment shall be minimum of SQ1 class mentioned in RDSO guidelines for earthwork. Blanketing thickness will be kept 550mm irrespective of the class of soil used in the embankment for this project. The design of blanketing material shall be decided as per RDSO specifications and Railway Board Guidelines and got approved from Competent Authority. **Natural Soil Blanketing will not be allowed.** The earthwork and blanketing should be done in compacted layers of specified thickness as per approved profile/cross sections. Necessary works of surface Erosion control is to be done as per latest RDSO guidelines. Slope stability analysis to be done for high embankments. **Latest RDSO guidelines shall be used while designing earth work and blanketing layers.**
- 1.3.9 Ground improvement for weak soil for earthwork as per RDSO guidelines is in the scope of contractor. Details of such tentative locations shall be identified during survey by the Contractor.
- 1.3.10 **Earthwork for Rail track Formation:** Design and Construction of the Earthworks in Embankment or Cutting including Rock Cutting for the Rail track Formation for the Main Lines, future tracks for the track work and, including but not limited to;
- (a) Dismantling, removing and stacking of existing Track structure, if required.
 - (b) Removing, screening & stacking of released ballast, if required.
 - (c) Clearing & Grubbing and Stripping,
 - (d) Excavation with or without Blasting,
 - (e) Embankment,
 - (f) Subgrade,
 - (g) Blanket Layer,
 - (h) Slope Protection & Erosion Control

For Rock Cutting Areas, following shall also be included

- (a) Protection Bund at the GL on both sides of rock cutting
- (b) Provision of Berms as per design
- (c) Catch Ditch to receive falling boulders if any



- (d) Slope stability measures
- (e) Safety refuge
- (f) All other related works as considered necessary

RDSO documents for Earthwork

All earthwork shall be executed as per the Guidelines issued by RDSO vide letter No.GE/GEN/ 185-Vol-I Dtd. 17.09.2020 i.e. Comprehensive guidelines and Specifications for Railway Formation –Specification No. RDSO/2020/GE: IRS- 0004, Sept-2020 and latest guidelines issued by the RailwayBoard/North Eastern Railway.

Note: Above conditions are for guidelines and not exhaustive and work will be executed as per latest specifications issued by RDSO from time to time.

1.4 Bridges

- 1.4.1 All bridges shall be designed and constructed in accordance with the design standards and specifications as per Indian Railway Concrete Bridge code, Indian Railway Steel Bridge Code, Indian Railway Foundation & Substructure Code, Indian Railway Bridge Manual and other codes and manuals specified in Schedule-D and Manual of Specifications and Standard for EPC Contract issued by Ministry of Railways. RDSO approved drawings shall be used as far as possible. All Important/Major/Minor bridges/RUB should be designed and to be constructed as per the latest guidelines of RDSO of speed 160 kmph.

Use of RDSO standard drawings if available, shall be preferred. As far as possible, the new bridges should have RDSO standard spans and RDSO standard drawings for 25 Tonne 2008 Railway loading standard. For intermediate span/heights, structural design details for immediately higher span/height configuration shall be adopted. Contractor shall provide RDSO standard design of the box as indicated in the scope of work.

The Contractor should give reasons in writing to the Authority Engineer wherever Standard RDSO drawing can not be used, subject to approval of Authority Engineer. Contractor may propose a suitable alternate structure, while conforming to relevant Railway/IS Codes, manuals, stipulations, subject to approval of the Authority engineer. This may be only for exceptional circumstances where RDSO standard drawings will be not possible to execute at site.

- 1.4.2 All bridges shall be designed for the following minimum recurrence interval of floods:
- a) For Important and Major Bridges: 1 in 100 years
 - b) For Minor Bridges: 1 in 50 years



- 1.4.3 For width and cross sections features of bridges refer GAD of Bridges provided in the enclosure.
- 1.4.4 Minimum size of RCC box shall be in accordance with the specifications and standards. Minimum clear opening of RCC Box with or without fill shall be 1×2.0×2.0m.
- 1.4.5 The Contractors should take adequate measures to protect the existing bank by sheet piling or shoulder piling or Anchor piling or Micro piling or any other suitable protection measures. Significant portion of the bridge work is required to be done close to the existing running lines, Adequate safety of these lines at all times during the execution of the work is of paramount importance. The work at such locations shall be done only after obtaining approval of CRS (if required) as per approved drawing and scheme.
- 1.4.6 Provision of drop wall, curtain wall, flooring, toe wall, boulder pitching as proposed and approved drawings by Authority. (Note: In all major bridges, toe wall and pitching shall be provided for a length of minimum of 30 m. on all four sides and for a length of minimum 15.0 m in case of all minor bridges. In box and pipe bridges, drop wall, curtain wall and other protection works will be provided as per the Bridge manuals/RDSO guidelines.)
- 1.4.7 The Contractor’s design shall recognise that the new bridges are to comply with the vertical clearances and free board as set down in the applicable standards, irrespective of the vertical clearance and free board of the adjacent Bridge. However, for relaxation in free board/vertical clearance as specified in the relevant provision of IRS Codes specific approval from the Engineer shall be taken under unavoidable circumstances like non availability of land or presence of other obligatory points.
- 1.4.8 The formation and new track shall be designed with smooth curves with speed potential of 160 KMPH and laid and linked accordingly. This aspect shall be kept in view while carrying out bridge design.

1.4.9 Important Bridges shall be constructed at the following locations:

S. No.	Bridge No	Proposed Location	Linear length of Bridge (in m)	Type of Superstr
1	Nil			

1.4.10 Major Bridges shall be constructed at the following locations:

S. N.	Bridge No	Proposed Location	Span Arrangement	Linear length of Bridge (in m)	Type of Superstructure
1	11	9258.318	3×12.2	36.6	PSC Slab
2	14	10428.54	4×12.20	48.8	PSC Slab
3	16	11276.68	3×12.20	36.6	PSC Slab



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S. N.	Bridge No	Proposed Location	Span Arrangement	Linear length of Bridge (in m)	Type of Superstructure
4	19	12381.93	1×30.5	30.5	Composite Girder
5	20	13397.267	1×30.5	30.5	Open Web Girder
6	22	14246.934	1×45.7	45.7	Open Web Girder
7	24	14770.644	2×12.2	24.4	PSC Slab
8	26	15390.331	2×12.2	24.4	PSC Slab
9	28	16738.594	3×12.2	36.6	PSC Slab
10	36	20325.4938	2×12.2	24.4	PSC Slab
11	46	26462.7598	3×12.2	36.6	PSC Slab

Note: In terms of RDSO Guidelines BS 121 (Guidelines For Provisions of OHE Mast For Electrification at New And Existing Bridge Pier/Abutment), the bidders are required to design the substructure of the following bridges with provision of OHE mast on pier/abutment.

S. No.	Bridge No.	Span Arrangement	Type of Structure
1	11	3×12.2	PSC Slab
2	14	4×12.20	PSC Slab
3	16	3×12.20	PSC Slab
4	22	1×45	Open Web Girder
5	28	3×12.2	PSC Slab
6	46	3×12.2	PSC Slab

1.4.11 Minor Bridges shall be constructed at the following locations:

a) Slab Bridges

S. No.	Bridge No	Proposed Location	Span	Linear length of Bridge (in m) and skew angle w.r.t. to track	Type of Super str	Drawing No.
1	17	12193.776	1×6.10	6.10	PSC Slab	RDSO/B-10274 & RDSO/B-10294
2	31	18409.0682	1×9.15	9.15	PSC Slab	RDSO/B-10272/R & RDSO/B-10294
3	34	19926.4675	1×9.15	9.15	PSC Slab	RDSO/B-10272/R & RDSO/B-10294

b) RCC Box Bridges

S. N.	Bridge No	Proposed Location	Span Arrangement	Barrel Length	Skew Angle	Drawing No.
1	2	4463.333	1×2×2	13.174	N/A	RDSO/B-10155 & RDSO/B-10155/3
2	4*	5532.885	1×2×2	*	N/A	RDSO/B-10155 & RDSO/B-10155/3
3	6**	6287.882	1×2×2	**	N/A	RDSO/B-10155 & RDSO/B-10155/3
4	8	7386.284	1×3×3	20.278	N/A	RDSO/B-10155 & RDSO/B-10155/5



S. N.	Bridge No	Proposed Location	Span Arrangement	Barrel Length	Skew Angle	Drawing No.
5	13	9800.428	1×3×3	18.226	N/A	RDSO/B-10152R & RDSO/B-10152/4R
6	29	17754.861	1×3×3	17.026	N/A	RDSO/B-10152R & RDSO/B-10152/4R
7	41	23587.5007	1×3×3	17.190	N/A	RDSO/B-10152R & RDSO/B-10152/4R
8	43	24129.5759	1×3×3	19.994	N/A	RDSO/B-10155 & 10155/5

* **Bridge No. 4:** The Barrel portion of this RCC box bridge has already been constructed. The Contractor is required to construct the wing walls/return walls/drop wall, back fill material at abutment side and boulder filling, boulder pitching or the required protection works as per the site conditions and the requirements of the Authority.

** **Bridge No. 6:** The Barrel portion of this RCC box bridge has already been constructed. The Contractor is required to construct the wing walls/return walls/drop wall, back fill material at abutment side and boulder filling, boulder pitching or the required protection works as per the site conditions and the requirements of the Authority.

1.4.12 Pipe Culvert

Pipe culverts will be constructed at the following locations:

S. No.	Location (km)	Type of culvert	Dia (m)	Length of barrel (m)
1	Nil			

1.4.13 Railway flyovers

Railway Flyovers shall be provided at the following crossings as per GAD attached:

S. No.	Bridge No	Crossing (Chainage)	Linear length of Flyover(dirt wall to dirt wall) (in m)	Vertical clearance w.r.t rail level
1	Nil			

1.4.14 Road Under Bridges (RUB)

RUBs are to be provided at the identified crossings as per the attached GADs.



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S. N.	Bridge No.	Crossing (Chainage)	Span Arrangement	Barrel Length	Skew Angle	Vertical Clearance above Road level (in m)	Drawing No.
1	3	4677.198	1×5.5×4	7.850	N/A	4.0	RS/D/B-10152/R & RS/D/B-10152/1R
2	5	5770.722	1×5.5×4	12.094	N/A	4.0	RDSO/B-10152/R & RDSO/B-10152/3R
3	7	7063.2445	1×5.5×4	8.000	N/A	4.0	RS/D/B-10155 & RS/D/B-10155/1
4	9	7768.415	1×5.5×4	12.106	N/A	4.0	RDSO/B-10152/R & RDSO/B-10152/3R
5	10	9053.979	1×5.5×4	8.750	N/A	4.0	RDSO/B-10152/R & RDSO/B-10152/2R
6	12	9673.271	1×6.0×4	10.104	30°	4.0	RDSO/B-10161/1R & RDSO/B-10161/R
7	15	10860.07	1×6.0×4	9.238	30°	4.0	RS/D/B-10162/R & RS/D/B-10162/1/R & RDSO/M-0001
8	18	12209.05	2×4.0×4.5	8.750	N/A	4.5	RDSO/B-10158 & RDSO/B-10158/2A & RDSO/B-10159 & RDSO/M-0001
9	21	13481.538	2×4.0×4.5	8.750	N/A	4.5	RDSO/B-10158 & RDSO/B-10158/2 & RDSO/M-0001 & RDSO/B-10159
10	23	14288.305	1×6.0×4	9.064	30°	4.0	RS/D/B-10162/R & RS/D/B-10162/1/R
11	25	14765.33	1×6.0×4	14.884	30°	4.0	RS/D/B-10162/R & RS/D/B-10162/1/R
12	27	15876.718	1×6.0×4	15.263	23°	4.0	RS/D/B-10162/R & RS/D/B-10162/1/R
13	30	17798.839	1×5.5×4	13.318	N/A	4.0	RDSO/B-10152/R & RDSO/B-10152/3R
14	32	19086.663	1×5.5×4	7.850	N/A	4.0	RDSO/B-10152/R & RDSO/B-10152/3R
15	33	19378.2898	1×5.5×4	7.850	N/A	4.0	RS/D/B-10152/R & RS/D/B-10152/1R
16	35	20029.698	1×5.5×4	8.000	N/A	4.0	RS/D/B-10155 & RS/D/B-10155/1 & RDSO/M-0001 & RDSO/B-10159
17	37	20800.056	1×6.0×4	9.064	30°	4.0	RS/D/B-10162/R & RS/D/B-10162/1R & RDSO/M-0001 & RDSO/B-10159
18	38	21832.2495	1×6.0×4	17.314	30°	4.0	RS/D/B-10162/R & RS/D/B-10162/1R & RDSO/M-0001 & RDSO/B-10159
19	39	22215.7092	1×6.0×4	10.104	30°	4.0	RS/D/B-10162/R & RS/D/B-10162/1R & RDSO/M-0001 & RDSO/B-10159
20	40	22716.1875	1×6.0×4	9.238	30°	4.0	RS/D/B-10162/R & RS/D/B-10162/1R & RDSO/M-0001 & RDSO/B-10159
21	42	23811.6718	1×6.0×4	9.200	18°	4.0	RDSO/B-10162/R & RDSO/B-10162/1R & RDSO/B-10159 & RDSO/M-0001



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S. N.	Bridge No.	Crossing (Chainage)	Span Arrangement	Barrel Length	Skew Angle	Vertical Clearance above Road level (in m)	Drawing No.
22	44	25037.8668	1×5.5×4	8.750	N/A	4.0	RDSO/B-10155 & RDSO/B-10155/1 & RDSO/B-10159 & RDSO/M-0001
23	45	26000.7901	1×5.5×4	7.850	N/A	4.0	RS/D/B-10152/R & RS/D/B-10152/1R & RDSO/B-10159 & RDSO/M-0001
24	47	26581.626	1×5.5×4	7.850	N/A	4.0	RS/D/B-10152/R & RS/D/B-10152/1R & RDSO/B-10159 & RDSO/M-0001
25	48	29013.4025	1×6.0×4	10.104	30°	4.0	RDSO/B-10162/1R & RDSO/B-10162/R & RDSO/B-10161 & RDSO/M-0001
26	49	29368.7955	1×6.0×4	8.466	21°59'57"	4.0	RD/D/B-10162/R & RD/D/B-10162/1R & RDSO/M-0001 & RDSO/B-10159

Note: The RCC box dimensions provided represent clear internal measurements and do not account for the thickness of the wearing course.

1.4.15 Road Over Bridges (ROB)

Road Over Bridges (ROB) shall be provided at the following crossings as per GAD attached:

S. N.	Bridge No.	Location (Chainage)	Span Arrangement	Linear length of Flyover dirt wall to dirt wall (in m) and skew angle w.r.t. to track	Length of approach of ROB	Type	Vertical clearance w.r.t rail level
							Nil

1.4.16 Canal/Channel

Unlined Canal/channel shall be provided at the following location as per L-Section no. GML1-2025/I-903149 attached.

S. N.	Chainage From (Km)	Chainage To (Km)	Length (Km)	Drawing No.
1	14.700	15.700	1.000 Km	Unlined Channel

1.4.17 The exposure condition for bridges shall be considered as MODERATE. Ordinary Portland Cement (OPC) shall be used in RCC and PSC works in accordance with Para 606 of the Indian Railway Bridge Manual (IRBM).



1.5 Track

- 1.5.1 The track layout shall be based on the provisions contained in the Indian Railways Permanent Way Manual, LWR manual, welding manuals and other manuals specified in “specification and standard for EPC contracts issued by Railway Board and latest specifications, correction slips and guidelines and codes & manuals specified in schedule D”.
- 1.5.2 The final designs of the track layouts, including horizontal and vertical alignment, station yard layouts, LWR plans shall be reviewed by the Authority Engineer in accordance with the provisions of the Agreement.
- 1.5.3 The track will be laid with R260 rail /60Kg rail on 60Kg PSC sleepers (wider base) of 1660 per km density with 350mm ballast cushion on main line. On the passenger loop line the track structure consists of 60 Kg new rails on 60Kg PSC sleepers (wider base) of 1660 per Km density with 300 mm ballast cushion. Other loop lines and track sidings, the track structure consists of 60 Kg second hand rails on 60Kg PSC sleepers (wider base) of 1540 per Km density with 250 mm ballast cushion
- 1.5.4 The Curve should be laid with transitions designed for speed potential of 160 Kmph and super elevation should be provided as per sectional speed. During earthwork only the super elevation should be provided to the blanket layer/subgrade for the curve portion.
- 1.5.5 Canted Turnout with Thick web switches and **Weldable** CMS crossing 60 kg should be provided on the main line as per direction of the Authority Engineer. Over riding switches and CMS crossing 60 kg should be provided on loop line and all siding as per direction of the Authority Engineer.
- 1.5.6 Design, Manufacture/Procure/Supply and Construction/Laying and linking of the Track Works capable of running trains with an axle load of 25.0 tonnes operating at a maximum speed of 160 km/hr using mechanized track laying technique including but not limited to rails, sleepers, ballast, fasteners, fittings and fixtures, spares as required, welding and laying, ballast tamping, testing, de-stressing, guard rail/ check rail (wherever required), turnouts, expansion joints, wayside signs, drainage including yard drainage and all other related works as necessary for the following:
 - (a) Main Line & Connecting Line electrified track capable of operating at a maximum train speed of 160 km/h
 - (b) Loop Line, Yards and Siding (yard layout) at each Station including but not limited to Machine Siding, Saloon Siding, Goods Siding, Dead Ends / Buffer Stops electrified track capable of operating at a maximum train speed of 30 km/h.

Note: Rails for main line, loop line and miscellaneous siding linking shall be issued to Contractor or his nominated representative free of cost.



1.5.7 Alignment of Track Ways

- A) The indicative Alignment and Yard layout for each Station as developed by the Authority is enclosed in the Alignment Drawings as part in the Reference Drawings. The Authority has acquired the adequate Right of Way (ROW) for the same and is staked at Site.
- B) The Alignment Drawings enclosed in the Reference Drawings are indicative and the Contractor shall be responsible for review, verifying its correctness & modifying/optimizing the same with reference to the Design Criteria and other technical and geometrical obligatory requirements with respect to existing IR tracks.
- C) During review of the alignment, if the Contractor notices any conflict with respect to the Right of Way, design-ability and constructability, the Contractor shall immediately notify the same to the Authority’s Engineer with supporting documents including data, calculations, maps and drawings.

1.5.8 Supply of track Ballast

All ballast shall be procured from the quarries approved by the Authority’s Engineer. All ballast shall be machine crushed and comply with the specifications set out in “IRS GE 1 June 2016/Latest amendments time to time”. When transported by road vehicle all ballast shall be dampened prior to leaving the quarry. Stacking of ballast will be done as per approved stacking plan by the Authority Engineer and ballast in stacks will be tested by the Authority’s Engineer as per laid down provisions issued by the Railway Board and NER. After testing of ballast, only passed ballast shall be permitted to use on the track and rejected ballast shall be removed from site.

1.5.9 Spreading of cess track Ballast

- a) The center line, ballast toe lines shall be marked by the contractor with lime as per the directives of Authority’s Engineer or his authorized representative. The ballast shall be spread on formation centrally to the central line of the proposed track, in a width of 4720/4870 mm. Initial spreading of the ballast shall be for a loose thickness of 250/300mm or upto the pre-determined marks on reference posts, so that after rolling at least 200mm thick ballast bed is available for P.Way linking.
- b) Ballast shall spread uniformly ensuring that no muck from the ballast stacks comes to the track. While picking up the ballast from the bottom layer of stacks, proper care shall be taken not to lift the ballast along with earth, dust the same shall be carried out at contractors cost and for which no extra payment shall be made. While picking up the ballast from the stacks, no ballast shall be left to waste at the stacking ground and on the slopes of banks or in cuttings.



- c) The balance quantity of the ballast shall be spread after P.Way linking in stages in order to achieve the required cushion and ballast profile as per latest IRPWM.
- d) The work of carrying and spreading the ballast from stacks shall include all lead, lift, decent crossing of tracks, roads and nullahs complete with contractor's own labour, tools and equipment, payment of taxes, incidental charges.

1.5.10 Materials for linking of Track

- i. Rails for main line, loop line and miscellaneous siding linking shall be issued to Contractor or his nominated representative free of cost from NER depots/stores which will be transported by the contractor at his own cost from stores to site. The materials thus issued, are to be accounted for by the Contractor and he shall be held responsible for any shortage or breakage till the track is taken over by the Authority. All other P.way materials as per RDSO drawings and specifications need to be procured by the agency at its own cost along with transportation. After linking of track, main line rails will be supplied by Railway wagon in panels whose loading & unloading & subsequent TRR with new Rail panels is within the scope of the contract. Stacking of rails shall be done as per approved stacking plan by the Authority Engineer.
- ii. Service rails & SH rail in 13m-6.5 m length up to the extent of 30 Track Km Quantity shall be issued to the contractor for temporary use progressively. After linking of track over service rail, new rail (free rail / 3 rail panel / 260m panel) will be arranged by the Authority. These will be welded using mobile Flash butt welding plants by the Contractor. The Contractor will have to lift the rails from nominated steel plant or nominated locations in Zonal Railway. The unloading of rails is to be done by the Contractor in case rail supply is available through railway wagons. Stacking of rails shall be done as per approved stacking plan by the Authority Engineer. The Service rails & SH rail thus issued, are to be accounted for by the Contractor and he shall be held responsible for any shortage or breakage till the track is taken over by the Authority. Service Rails and SH Rails shall be returned to the Railway as per the direction of Authority Engineer.
- iii. All type Sleepers i.e., PSC Line Sleepers, turn out, SEJ, Level Crossing and Bridge sleepers, glued joints, shall be procured by EPC Contractor from RDSO approved sources for the work.
- iv. All track fitting shall be procured by EPC Contractor himself, from RDSO approved sources for the work. Inspection of all track fittings will be done by RDSO/Rites as per specification or any third party agency approved by Authority Engineer. Authority Engineer will allow use of track fittings after verification of Inspection Certificates issued from the issuing Authority As per Railway Board guidelines, no rails will be provided for supply of fabricated items i.e. Switches, SEJs, Glued joints, Guard rails.



- v. The panels of rail shall be handled as per the guidelines of Railways, so as to avoid any defects like dents/grip marks notching or cuts, bends, damage at the ends.

1.5.11 Linking

- i. Concrete sleepers should be unloaded with great care. Use of rubber tyres and any other similar arrangements are to be used for preventing shock unloading. Stacking of Concrete sleepers and other track materials shall be done as per approved RDSO specification or plans approved by the Authority Engineer.
- ii. Grooves of the rubber pad should be placed along the length of the rail.
- iii. Driving of the ERC (after greasing with approved graphite grease to prevent rust & binding with inserts) should be in such a way that ends of the central leg and the heel are flush with the two edges insert.
- iv. Hammer of desired weight (1.9 kg to 2 Kg.) should be used for driving ERCs. ERC applicator should be used to properly drive the ERCs after final round of tamping.
- v. After linking of track over service rail, new rail (free rail/3 rail panel/260m panel) will be arranged by the authority. Stacking of rails shall be done as per RDSO specification/Railway Specification. Painting of new rails will be done as per RDSO guidelines.
- vi. Before undertaking actual linking, line & level pegs should be fixed as indicated below:
 - a. Level pegs at the beginning, end and at every 10 m. internals for vertical curves & 30m. on either side of the bridge approach.
 - b. Centre line pegs at every 30m. intervals on straight and 10m.interval on curve.
 - c. Centre line pegs at the following locations should be concreted for future reference: -
 - 1. The beginning & end of transitions.
 - 2. Every 30m. on curves.
 - 3. Approaches of bridges & level crossing.
 - 4. Every half Km. on straights.
 - 5. The beginning of every turnout.
- vii. The rail shall first be straightened for removal of kink with the help of Hydraulic Jim crow of adequate capacity.
- viii. The rails shall be connected by means of a pair of fish plates using in the first instance only 2 fish bolts and nuts one in each rail. Before fishing the rail ends, the fishing edges of the fish plates, the rail ends and fish bolts shall be lubricated with grease, graphite and oil of approved quality & grade as directed by the Authority Engineer at site of work. Correct expansion gaps as



directed by the Authority Engineer shall be ensured between ends of rails by inserting liners.

- ix. Paint marks shall be made on the rails with paint as directed by the Engineer to indicate the spacing of sleepers to be adopted on curves marked on the outer rails to ensure radial spacing while transferring it by ‘T’ square on the other rail.
- x. The linked track shall be aligned correctly to the line pegs. Hammering of sleepers which are out of square should be avoided. Sleepers that are squared should be re-gauged immediately, the fastening tightened and repacked. The contractor is responsible for giving correct alignment in the straight and in curve portion required as per degree of curve until alignment is approved by the Engineer.
- xi. Oiling and greasing of fish plates before fastening the rails will have to be done with contractors tools and consumables like plumage, kerosene oil, black oil, brushes.
- xii. The Glued joint can be either prefabricated or in situ. The decision of Authority Engineer shall be final.

1.5.12 Ballasting and Initial Packing

- i. Ballast should be first spread over the formation as per required thickness approved by the Authority Engineer and rolled by using a road roller to ensure uniform & compact ballast cushion under the sleepers.
- ii. Full ballast sections and profile as prescribed for different types of tracks, i.e., SR/SWR/LWR is to be provided as per the provisions of IRPWM & LWR manual including the provisions regarding extra shoulder width on curves.
- iii. Initial through packing should be of such standard so as to make track fit for 20 KMPH.
- iv. The ballast should be spread over the linked track covering it completely to a uniform height and width as directed by the Authority Engineer or his authorized representative.
- v. Lift the track correctly as directed by the Authority Engineer or his authorized representative.
- vi. Pack the ballast under the sleepers.
- vii. Correct the alignment of rails, square the sleepers, adjust gauge as directed by the Authority Engineer. Check cross levels and lift and repack wherever necessary.



1.5.13 Final Adjustment and Packing

- i. “Picking Up” of slacks after running of test trains which may consist of ballast trains rolling by Diesel/Electric Powers after each packing. The 1st/2nd/3rd packing is considered to be completed once the picking up of slacks is completed and certified by the Authority Engineer, after each packing. The back packing work is normally required to be completed within 2 (two) months after linking of the track and initial packing thereof.
- ii. Test the track with loaded dip-lorry or engine as directed by the Authority Engineer and lifting of the track and packing wherever sags have formed. Engine will be provided by the Railway.
- iii. Any sleepers which have shifted from correct spacing or gone out of square shall be moved back and squared after loosening the fastenings. The fastenings shall be tightened again after squaring work. No hammering of sleepers to be done.
- iv. The track shall be slewed to correct alignment by sighting along the rail head of the base rail. It should be ensured that the track does not get lifted in the process of slewing.
- v. Alignment on curves & transitions is to be checked and minor adjustment is to be made.
- vi. Alignment kinks and gauge kinks to be rectified to avoid permanent set.
- vii. Lubrication of gauge in all tracks is to be done.
- viii. All steps of through packing as given in IRPWM shall have to be followed.
- ix. Pre, During & Post Tamping operations shall be carried as per IR Track Machine Manual (Para 3.12, 3.13 & 3.14) HSD, consumable shall be supplied by EPC contractor on his own cost. For more information about Track machines, Schedule P of this document should be referred.

1.5.14 Specification for Finished Work.

- i. **Ballast Section.**

The ballast section should be uniform in height, width and side slopes and brought to standard section as directed by the Authority Engineer with the quantity of ballast made available. No ballast shall be left on the cess side slopes of bank or near toe of bank.
- ii. The track geometry will be recorded in floating condition after running of train & the track parameters should be within the following tolerances: -



S.No.	Track Parameter	Item	Laying Standard
1	Gauge	Sleeper to sleeper variation	2 mm.
2	Expansion gap	Over average gap worked out by recording 20 successive gaps	± 2 mm.
3	Joints	Low joints not permitted High joints not more than. Squareness of joints on straight	± 2 mm. ± 10 mm.
4	Spacing of sleepers	With respect to theoretical spacing	± 20 mm.
5	Cross level	To be recorded on every 4th sleeper	± 3 mm.
6	Alignment	On straight on 10M. Chord. On curves of Radius more than 600 M. on 20M. Chord. Variation over theoretical versines: On curves of Radius less than 600 M. on 20M. Chord. Variation over theoretical versines:	± 2 mm. 5 mm. 10 mm.
7	Longitudinal level	Variation in longitudinal level with reference to approved longitudinal sections.	50mm.

The above tolerances list is indicative and for guidance only and the track parameters should be as per latest provision given in Indian Railway Permanent Manual.

1.5.15 Welding of Rails

The welding of rail joints to convert the track into LWR/CWR is to be carried out as per provisions of “Indian Railways manual for flash butt welding of Rails-2012” and “Manual for fusion Welding of Rails by the Alumino-Thermic Process (1998 Edition)” in strict technical supervision of competent authority having a valid competency certificate for the particular category of welding technique issued by DG(M&C) RDSO/Lucknow for firms and by Thermite portion plant of Northern Railway, Lucknow for Zonal Railways. The work of welding of rail joints shall be carried either on cess/track without traffic blocks or under traffic as per the directions of the Authority's Engineer.

1. Rails are to be welded as per the provision of Indian Railways Manual for Flash Butt Welding of Rails-2012 with Mobile Flash Butt Welding Plant. **At special locations where the use of Mobile Flash Butt welding is not practical, Alumino Thermic (A.T) SKV process may be used with prior permission of the Authority's Engineer.** AT welding will be done as per the procedure and specifications laid down in the latest edition of Manual for Fusion Welding of Rails by the Alumino-Thermic Process with the latest amendment slips.
2. For mobile flash butt welding, the contractor has to deploy the mobile flash butt welding machine and QAP of this machine should be duly approved by RDSO. QAP for welding for every site has to be prepared



and got approved by the Railways. Supervisor and Welders must have a valid approved License.

3. Contractor shall arrange approved welding portions, prefabricated moulds, consumables, equipment and actual execution of welding from the firms approved by RDSO for manufacturing of the portions and execution of the welding.
4. The contractor shall be responsible for removal of all kinks and twists in the rails, particularly within 1.8 m from either end. Once the rails to be welded have been aligned, leveled, cleaned and provided with the specified amount of gap, it shall be the responsibility of the contractor to weld the joint and to guarantee its satisfactory performance.
5. Maximum percentage of defective welds during initial weld testing should not exceed 2%. In addition to free replacement of defective weld, a penalty of Rs 20,000/- be also imposed for each defective weld beyond 2%. The defective percentage be calculated for a group of 500 welds or part thereof.
6. The contractor shall not carry out any welding work between sun-set to sun-rise. He should make his own arrangements to protect the work against wind and weather in the course of execution. No welding work shall be done during heavy rains. Work during light rain may be done in accordance with the local instructions. However, the contractor shall keep ready all protective arrangements such as trolley umbrella, non-woven thick polyethylene tarpaulin at his own cost.
7. A) finished joint will be accepted as good on considerations of dimensional accuracy, if it satisfied the following tolerances:
 - (i) Vertical alignment : Variation not more than +1.0mm, -0.0mm measured at the end of one metre straight edge.
 - (ii) Lateral alignment : Variation not more than +0.5mm measured at centre of one metre straight edge.
 - (iii) Finishing of top surface : +0.4 mm, -0.0mm measured at the end of 10 cm straight edge.
 - (iv) Head finishing on sides : + 0.3 mm over gauge side of the rail head measured at the centre of 10cm straight edge.

The aforesaid tolerances are indicative, should be as per latest provisions, and only applicable in case of new rails, but in case of existing rails where there is depression of more than 1 mm measured with 1 meter long straight edge placed centrally on the rail head before welding the



tolerances would be decided at site between contractor and Authority's Engineer.

8. In case of in-situ welding, the rail fastening for at least 5 sleepers on either side of the proposed weld shall be loosened.

1.5.16 Greasing Rails, ERC & M.S. Liners.

- i. No ERC & M.S. Liners will be put into the track without greasing. ERC & M.S. Liners are to be greased as per the procedure laid down in IRPWM & as per the instruction of Authority's Engineer.
- ii. Grease graphite used for ERC clips and liner shall be as per IS: 408, Grade 'O'.

1.5.17 Track Tamping by Machines:

(A) **Pre-tamping attention**– To achieve good results the contractor should carry out the following preparatory work before taking up the tamping:-

- (a) Ballasting where there is shortage of ballast.
- (b) Heaping up of ballast in the tamping zone, to ensure effective packing.
- (c) Making up of low cess.
- (d) Cleaning of pumping joints and providing additional clean ballast, where necessary.
- (e) Attending to Hogged joints before tamping.
- (f) Tightening of all fittings and fastenings like fish bolts and keys, splitting of cotters, and replacement of worn-out fittings.
- (g) Renewing broken and damaged sleepers.
- (h) Squaring of sleepers and spacing adjustment; re-gauging to be done as necessary.
- (i) Adjusting creep and expansion gap in rails.
- (j) Examination of rails for cracks.
- (k) Realigning of curves which are badly out of alignment.
- (l) Clearing of ballast on sleepers to make them visible to the operator.
- (m) All obstructions such as signal rods, cables, pipes, level crossing check rails, likely to be damaged by the tampers should be clearly marked and made known to the tamping operator before he starts work. Tight overhead clearance should also be brought to his notice; the beginning and end of transitions should be marked. Superelevation should be marked on every second sleeper so that it can guide the operator for leveling up correctly.

(B) **Post Tamping Attention**– The contractor shall pay attention to the following points:

- (a) As some of the rigid fastenings might get loose, tightening of fittings should be done immediately after tamping.
- (b) Any broken fitting should be replaced.



- (c) Proper quality check of work done by a tamping machine is important. Immediately after the tamping work, the track should be checked, in respect of cross levels and alignment, and action taken as considered necessary.
- (d) The ballast should be dressed neatly and proper consolidation of ballast between the sleepers should be done.

1.5.18 Laying of LWR

The Contractor should prepare the LWR plan and get the approval of Authority's Engineer and Authority.

Destressing:-

Destressing of LWR /CWR shall be done as per the procedure prescribed in LWR Manual using Hydraulic rail tensors.

For making the closure rail to be put behind the SEJ, abrasive rail cutting machine shall be used. The joints in LWR shall be welded immediately after destressing.

Laying:-

LWR should be laid as per the LWR plan approved by Authority and as per the instructions contained in LWR manual followed by laying of switch expansion joint. Thereafter, destressing of the welded panel shall be carried out as per the laid down guidelines.

Before laying SEJs, they should be completely oiled and greased.

- 1.5.19 Procurement, fabrication & manufacture of P. Way material and fittings. The P. Way material & fittings shall be procured from RDSO approved firms only, as per list issued by RDSO and available at RDSO website. The P.Way material & fittings shall be procured only after testing, checks and approval as prescribed by RDSO/RITES/Railways. Tentative list of P-way materials is given below. The successful bidder should assess and procure the actual requirement as per survey and approved drawings after the work is started.

Indicative List of P.Way Material for Linking (Paniahwa- Madhubani Section)			
S.N.	Description	Unit	Quantity



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Indicative List of P.Way Material for Linking (Paniahwa- Madhubani Section)			
S.N.	Description	Unit	Quantity
1	Supplying and stacking of machine crushed stone track ballast from Private quarry conforming to RDSO's latest specification with upto date correction slips along the track between Gorakhpur Cantt (Incl) to Panihawa (Exl.) station including all taxes, royalty, including G.S.T. and other liability by local, state and Central authority and stacking as per instruction of Railway's representative with Contractor's Labour, material, tools & plant etc. complete in all respect including carriage with all lead & lift ascend, descend, crossing of the track, nallah. rehandling if any etc.(a) Basic cost of ballast including GST.	cum	85000
2	Supplying and stacking of machine crushed stone track ballast from Private quarry conforming to RDSO's latest specification with upto date correction slips along the track between Gorakhpur Cantt (Incl) to Panihawa (Exl.) station including all taxes, royalty, including G.S.T. and other liability by local, state and Central authority and stacking as per instruction of Railway's representative with Contractor's Labour, material, tools & plant etc. complete in all respect including carriage with all lead & lift ascend, descend, crossing of the track, nallah. rehandling if any etc.(b) All other elements including transportation and GST.	cum	85000
3	Supply of P.Way Components GFN Liners to RDSO Drg. No. T-3706	Each	12000
4	Supply of Glued insulated rail joint 60 KG Kg rail section as per RDSO Drg No. RDSO/T 5843	Each	230
5	Supply of PSC sleepers for SEJ as per RDSO Drawing No. T-4149 for 60 KG rail.	Set	32
6	Supplying at site of work including leading, loading, unloading and stacking of Special PSC Monoblock Sleepers (pre-tensioned type) for B.G. 1 in 8.5 Derailing Switch as per RDSO Drg. No.-T- 6068 to suite both 52/60 in rail or per RDSO Design and IRS specification No. T. 4596 2nd Edition) as amended from time to time with contractor's labour, materials, tools & Plant, equipment and machinery, transport etc complete.	Set	2
7	Supplying at site of work including leading, loading, unloading and stacking PSC turnout sleepers and approach sleepers for fanshaped layout of 60 kg 1 in 12 turnout for B.G 60 Kg. (UIC) rail/52 kg rails to ROSO Drg. No. 1-4218 Alt-5 (for general layout) and drawings thereof with latest alterations if any, complete set with contractor's labour, materials, tools & Plant, equipment and machinery, transport etc. complete	Set	16
8	Manufacturing and supply of Self Propelled Light Weight Trolley as per RDSO Specification No. TM/SM/28 Rev. 01 of 2004 with latest amendment.	Set	2



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Indicative List of P.Way Material for Linking (Paniahwa- Madhubani Section)			
S.N.	Description	Unit	Quantity
9	Supply of Grooved Rubber Sole Plates for 1 in 12 turnouts for layout Drg. No T-4218 with latest alterations if any, complete set for the turnout as per IRS specifications for Grooved Rubber Sole Plate (6mm thick) for placing beneath rails Sl. No. T-47-2006 with up to date corrigendum if any.	Set	16
10	Supply of GFN liners confirming to RDSO Drg. No T-8751 for Wider Base Sleepers	Each	60000
11	Supply of Composite Grooved Rubber Sole Plates (CGRSP) confirming to RDSO Drg. No. T-8747 for wider base sleepers.	Each	125446
12	Supply of PSC sleepers (wider base) for bridges with provisions for guard rails as per RDSO Drawing NO. T-8970 for 60 Kg rails.	Each	1000
13	Supply of PSC sleepers (wider base) for bridge approaches with provisions for guard rails as per RDSO drawing No. T8971 to T-8978 for 60 Kg rail.	Set	16
14	Supply of P.Way Components ERC to RDSO Drg. No.T-3701	Each	10000
15	Supply of P.Way Components ERC "J" to RDSO Drg. No.T-4158	Each	700
16	Supply of Fish plates 52 KG as per Drawing No. T-090 (M)	Each	10000
17	Supply of Combination fish plates 1 meter long (4 Nos. per set) as per Drawing No.T696 to T699 including nuts, bolts and washers For 60 KG & 52 KG Rail Sections	Set	10
18	Supply of fish bolts with nuts for 60 KG, 52 KG rails as per RDSO Drawing No.T-1899, T-11501.	Each	2000
19	Supply of jogged fish plates (2 No. per set) with 4 pair clamps, 4 No. Bolts & Nuts and 8 No. special washers. For 60 KG as per RDSO Drawing No. T 4016/T 5840	Set	300
20	Supply of Fish plates ONE meter long as per standard drawing of KD30 60 KG rail (As per RDSO Drg.No.T-5916/T-5851)	Each	300
21	Supply of Fish plates ONE meter long as per standard drawing of KD30 Supply of screw clamps for fish plates as per RDSO Drg No. T-5856	Each	800
22	Supply of 60kg 1 in 12 TWS switch confirming RDSO Drg. No. T-6155 with latest alterations, if any complete with all parts as listed in the drawing with check rails (excluding fish plates, Fish bolts & nuts, GRSPs, Liners and ERCs). LH	Set	8



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Indicative List of P.Way Material for Linking (Paniahwa- Madhubani Section)			
S.N.	Description	Unit	Quantity
23	Supply of 60kg 1 in 12 TWS switch confirming RDSO Drg. No. T-6155 with latest alterations, if any complete with all parts as listed in the drawing with check rails (excluding fish plates, Fish bolts & nuts, GRSPs, Liners and ERCs). RH	Set	8
24	Supply of 60 KG 1 in 8 1/2 Derailing Switch conforming to RDSO Drg No. 6068 with latest alteration, if any complete with all parts as listed in the drawing including GRSPs (excluding fish plates, fish bolts & nuts, Liners and ERCs). RH	Set	2
25	Supply of 60 kg CMS Crossing for 1 in 12 PSC Layout conforming to Drg. No. T-4220 with latest alterations complete with all parts as listed in the drawing (excluding fish plates, fish bolts & nuts, GRSPs, Liners and ERCs).	Numbers	12
26	Fabricating & supplying of 60 Kg improved SEJ with 65 mm max. gap as per Drawing No. RDSO/1- 6922 with latest alteration including all fixtures and fastenings etc complete as directed by Engineer-in-charge	Set	32
27	Supply of ERC MK V conforming to RDSO Urg. No. I 5919 for Wider Base Sleepers.	Each	240000
28	Supply of PSC wider sleeper T-8746	Each	60000
29	Fish bolt 25*160	Each	150
30	Combination SEJ 60/52KG T-6782 with all fittings	Set	1
31	Metal liner T-8748	Each	192400
32	Plate screw T-3912	Each	4300
33	Plate screw T-3913/3001	Each	1850
34	Single coil spring washer T-10773	Each	30000
35	TWS switch clamp 60 KG	Each	25
36	Metal liner T-8749/8750 for 52 KG rail on PSC wider sleeper T-8746	Each	200000
37	Goods, Designing, Manufacturing, Supplying, Installation and Field Trial of 1 in 12 Canted Turnout with Thick Web Switch, Weldable CMS Crossing, PSC Sleepers & all Fastenings along with, Lead Rails, Back Driving Assembly compatible with Indian Railway Standards (IRS) type of point machine on IR for 60 kg track, including all fittings, fastenings, fixtures, stretcher bars etc. as required with complete arrangement, excluding 'point machines, rodding's & clamp locks', meeting the laid-down requirements i.e. Functional Requirements and Specifications issued by RDSO and undertaking the field trials as applicable for:- Canted Turnouts fit for speed potential of 45 kmph on diverging line. (It is mandatory that there should be no change in the yard layout for laying such canted turnouts i.e. the canted turnouts should be compatible for the existing yards. In case of crossovers, the centre to centre distance shall be 5.3m.)	Set	12



Note: As per Railway Board guidelines, no rails will be provided for supply of fabricated items i.e. switches, SEJs, glued joints, guard rails.

1.6 Railway level crossings

The railway level crossings shall be provided at following locations:

S. N.	Chainage	LC No.	Class	Road Width
1	Nil			

1.7 Track layouts in station yards

Station yards shall be constructed as per the final Engineering Scale Plans (ESP) enclosed. However, the details provided in the ‘ESPs of station yard’ are indicative, approximate and for guidance only. The same shall be reviewed, revalidated and firmed up by the contractor with respect to his own design, planning and modify the same in conformity with Design criteria, specifications, standards & best practices duly approved by Authority’s Engineer and Authority.

The indicative Engineering Scale Plan (ESP) are as follows;

S.N.	Yard	Remarks	ESP Drawing no.
1	Chhitauni	Crossing Station	GML1-2025/Y-906263
2	Jataha	Crossing Station	GML1-2025/Y-906265
3	Madhubani	Crossing Station	GML1-2025/Y-906264

1.8 Building Works:

All items of building works shall conform to specification of works as per specification in Schedule-D, Railway Board letter no-2013/LMB/10/15 dated 11/12/2013, Railway Board letter no-2024/LMB-II/2/3 New Delhi dated 05/04/2024, Indian Railway Construction Manual, December,2023 (with latest correction slips) and relevant instructions updated time to time and Specifications for EPC. The building work shall include electrical internal wiring with allied work, electrical power supply arrangement with transformer/main distribution supply, sanitary fittings, sewerage system, water supply arrangement (bore wells, pump house, water tanks) and internal fittings, approach roads, street lighting, fencing, site leveling and other works incidental to buildings. Building works shall be deemed to include structures at Level Crossings for interlocking purpose, fencing and other necessities at Level Crossings as per IRPWM.

Suitable layout plan duly indicating all the above items shall be developed by Contractor in consultation with the Authority’s Engineer for each station and submit the same for approval.



1.8.1 Railway stations

Railway stations shall be constructed at the following locations:

S. N.	Name of Station	Centre line chainage	Nos. of platform and their individual length and width (m)	Minimum width of platform (m)	Nos. of foot over bridge with width (m)
(1)	(2)	(3)	(4)	(5)	(6)
1	Chhitauni	3117	2 Nos. <ul style="list-style-type: none"> 1 High Level Platform, Length 350 m and width 7.0m. 1 High Level Platform*, Length 550 m and width 9.75 m (Existing) 	7.0 m 9.75 m	1 No. (3.66m)
2	Jataha	16100	1 No. <ul style="list-style-type: none"> 1 High Level Platform, Length 350 m and width 7.0m. 	7.0 m	NIL
3	Madhubani	28350	1 No. <ul style="list-style-type: none"> 1 High Level Platform, Length 350 m and width 7.0m. 	7.0 m	NIL
Nos. of stairs on each platform	Lifts/ Escalators	PF Shelter (Nos.) L×B	Washable Apron	Watering Line	Parking (Sq. Metre)
(7)	(8)	(9)	(10)	(11)	(12)
-	-	32m×7.14 m	N/A	N/A	-
-	-	32m×7.14 m	N/A	N/A	-
-	-	32m×7.14 m	N/A	N/A	-

(i) The minimum thickness of VDF shall be 150 mm.



- (ii) The RDSO Guideline CAMTECH Handbook Specifications, February 2021, is attached. The Bidder shall follow the said RDSO guideline or the latest applicable guidelines for execution of the work

* For the existing platform (Length: 550 m, Width: 9.75 m) at Chhitauni Station, modifications shall be carried out by providing appropriate surface treatments. Vacuum Dewatered Flooring (VDF) shall be applied in open areas, while granite flooring shall be provided in covered areas. Alternatively, modifications shall be executed as per the requirements of the Authority.

The surface finish of passenger platforms shall be vacuum dewatered concrete surfacing with properly watered and compacted good quality earth fill and metalling. Anti-skid tiles of 25mm thickness as per relevant IS specifications has to be provided for a width of 1.8 m from the edge of platform all along the length of H.L platform. At the end of the platform, a ramp of 1 in 12 is to be provided with the same top surfacing finish.

Note: Platform walls, foot over bridge (FOB), surfacing of platform, FOB, covering shed, circulating area, colony roads, water supply and drainage arrangements shall be carried out as per the ‘ESPs of station yard’ attached. All passenger amenities will be provided as per the Railway Board-RB/L&A/001/2018 letter No.2018/LM (PA)/03/06 dated 09.04.2018 (with latest amendments) and latest guidelines. The details provided in the ‘ESP of station yard’ are indicative, approximate and for guidance only. The same shall be reviewed, revalidated and firmed up by the contractor with respect to his own design, planning and modify the same in conformity with Design criteria, specifications, standards & best practices duly approved by authority’s engineer and authority. The decision of the Authority Engineer for providing passenger amenities at a particular station will be final.

1.8.2 Service Buildings

Service buildings shall be constructed at each station as follows:

S. No.	Station	Service building	Area at ground floor level	Drawing No.
1	Chhitauni	Nil	Nil	Nil
2	Jataha	SSP Control Building	128 sqm	-
3 a.	Madhubani	OHE/PSI Depot.	202+112 = 314 sqm	-
3 b.	Madhubani	Tower Wagon Shed	450 sqm	-



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S.N.	Name of Station Building	Proposed Station Building Centre Line Chainage/Km.	Station Building	Drawing No.
1	Chhitauni	3+117 (3.117)	1 No.	Dy. C.E./CON/PLAN NO. S/04/28025
2	Jataha	16+100 (16.100)	1 No.	Dy. C.E./CON/PLAN NO. S/02/280225
3	Madhubani	28+350 (28.350)	1 No.	Dy. C.E./CON/PLAN NO. S/03/280225

Architecture and profile of buildings shall conform to local aesthetic, cultural ethos and it shall be approved by Authority Engineer. Architectural plan and elevation shall be prepared by the contractor keeping in view the religious importance of this place shall got it approved by the authority. Buildings' architecture and profiles should adhere to regional, religious aesthetic standards, cultural norms Contractor shall also provide walk-in-3D animation & time lapse 1 minute video of proposed building, orthophotos and drone video of before and after and during construction.

1.8.2.1 Track machine siding shall be constructed as shown in ESP with the following facilities:

Station	Concrete Pathway	Fencing	Power Supply	Water Supply	Approach Road	Any other item
Nil						

1.8.2.2 The foundations of buildings shall be designed for at least one storey more than the requirement i.e. (for two storey)

Construction of Service building should be as per following details:

S. N.	Description	Specification	Skirting/Dado
1	All rooms	Flooring with vitrified tiles (Kajaria or similar make).	Same with 150 mm high
2	Verandah	Flooring with Kota Stone (20 mm thick).	Same with 150 mm high
2a	Concourse/Porch/PP shelter	Flooring with Granite stone (18 mm thick).	Same with 150 mm high
3	Booking Counters	Granite table top	Same with 2100 mm high
4	Toilet/Bath/WC	Flooring tiles (anti-skid), along with European water closet & porcelain wash basins will be provided. Granite table top for wash basin.	Same with 2100 mm high
5	Battery Room	Flooring with acid proof tiles(non-glazed)	Same with 2100 mm high



S. N.	Description	Specification	Skirting/Dado
6	Porch	Paver blocks/Chequered tiles	
7	Internal finish	All walls finish in POP followed by 8acrylic/oil bound emulsion paints of brand Asian, Nerolac, Berger or similar make.	
8	Railing	Stainless steel railing	
9	Door/Window ventilator	For Doors and Window ventilators, anodised aluminum frames & shutter with glass panel provided.	
10	Door shutter	For all buildings wooden flush doors will be provided in rooms. All doors/window wood should be chemically treated for Anti-termite action and have ISI certificate	
11	Window shutter	Anodised Aluminum shutter frame with glass panel or PVC frame.	
12	Grill	MS Iron	
13	External finish	Texture finish from Asian paints, Berger, Nerolac or similar	
14	Terrace finishing	Cement slurry mixed with tapecrete acrylic based polymer waterproofing compound (having solid content 30%+-2,PH>7) in a ratio of 2:1(2 cement:1 waterproofing compound) followed by laying of fibre glass cloth; 2nd coat of cement slurry mixed with acrylic based polymer waterproofing compound and a final coat of water proofing compound and a final coat of water proofing compound rush topping having water proofing compound, cement and c/s and @ 1:2:2 by weight	

Service Buildings should be constructed as per the details provided above (1.8.2) which are indicative, approximate and for guidance only. The same shall be reviewed, revalidated and firmed up by the contractor with respect to his own design, planning and modify the same in conformity with Design criteria, specifications, standards & best practices duly approved by authority's engineer and authority.

1.8.3 Staff quarters

Construction and development of staff colony comprising of following types of staff quarters at each station:

S. N.	Station	Type	Single/Multi-storey	No.	Drawing No.
1	Chhitauni	II	-	7 units	GML1-2014/T-911008
		III	-	3 unit	GML1-2015/T-907005
2	Jataha	II	-	10 units	GML1-2014/T-911008
		III	-	4 unit	GML1-2015/T-907005
3	Madhubani	II	-	10 units	GML1-2014/T-911008
		III	-	4 unit	GML1-2015/T-907005

Note: -

- Internal roads shall be constructed as per site requirements and connected to the nearest station road.
- Adequate horticulture shall be provided for overall area development.



3. Internal and external civil works, including water supply from the nearest available source, shall be provided.
4. Internal and external electrical connections shall be ensured.

1.8.4 Out-door power supply, distribution, and lighting works

Nil

1.8.5 Water supply and distribution

The Contractor shall be responsible for ensuring a sufficient water supply at platforms (including provision of water hydrants), station buildings, offices, staff quarters, and other designated areas. An Overhead Water Tank (OHWT) along with a pump house shall be constructed for the station buildings as part of the scope.

- (1) The water supply and distribution pipeline shall be constructed using High Density Polyethylene (HDPE) or Polyvinyl Chloride (PVC) pipes. Before the material is put to use, the Contractor shall obtain approval from the Authority Engineer/Authority.
- (2) An RCC Overhead Water Tank (OHWT) of 50,000-gallons capacity with 20-metre staging height shall be constructed at each station. The indicative Drawing No. W/81/1/DRG (PL)/28/Pt-I of the OHWT.
- (3) A Borewell with Pump House shall be constructed for each Overhead Water Tank (OHWT), including all required internal and external fittings, and shall be made fully functional to ensure adequate water supply and proper discharge.
- (4) The Contractor shall provide proper water supply to all staff quarters, ensuring full functionality in toilets, bathrooms, kitchens, and at all other required locations.

The above-mentioned scope of work is indicative and not exhaustive. The Bidder shall be responsible for survey, investigation, design, and construction, and shall accordingly carry out its own surveys, investigations, and detailed studies for the preparation of designs and drawings.

Note :- Water pipelines of the required diameter and length shall be provided to the proposed high-level platform, proposed station building, S&T building and cabin, SSE's office, and staff quarters from the OHWT or from the existing water source available at each station, as directed by the Authority Engineer.

1.8.6 Drainage system

The Contractor shall provide an efficient drainage system, including disposal of wastewater from buildings, staff quarters, yard drains, and overall site drainage, in accordance with the approved drainage plan and subject to the approval of the Authority Engineer. Additionally, the Contractor shall ensure



a reliable water supply to the new service buildings, based on site-specific requirements.

1.8.7 Sewerage system

Septic tanks of adequate capacity shall be constructed in the colony and at the stations, along with sewer lines using SW or PVC pipes. At the stations, the sewerage system shall be developed in accordance with the approved drawings issued by the Railway Authority. Implementation of an efficient sewerage system, subject to the approval of the Authority Engineer, is included in the scope of work.

Note:

- (1) A Septic Tank shall be constructed at each Station Building and at each Staff Quarter location, in accordance with the indicative Key Plan No. N.E.R./LY/C.E.(MET)/PLAN No. S/193/66 of Septic Tank and Macerating Chamber.

1.8.8 Toilet

The work includes the provision of toilet facilities at staff quarters and station buildings, including urinals. "Pay and Use" toilet facilities shall also be provided at the stations. All necessary water supply and sewerage connections shall be ensured for the smooth functioning of these facilities.

1.9 Pedestrian Bridges

Foot over bridges for pedestrians crossing railway track/station shall be constructed at as follows:

S. No.	Station/ Block Section	Length	Width	No. of staircase
1	Chhitauni	26.78m	3.66m	As per site requirement

Typical RDSO FOB drawings for 3-track crossings are enclosed for reference. The Contractor shall submit the General Arrangement Drawings (GADs) of the Foot Over Bridge (FOB), based on the above standard drawings, for approval by the Authority Engineer.

Note: The details provided above are indicative, approximate, and for guidance only. The Contractor shall review, revalidate, and finalize the same in accordance with their own design and planning, and shall modify them as necessary to ensure conformity with the design



criteria, specifications, applicable standards, and best practices, subject to the approval of the Authority Engineer and the Authority.

1.10 Service roads/ internal roads/approach roads and footpaths

Service roads/ internal colony roads/approach roads and footpaths shall be constructed at the locations and for the lengths and widths indicated below:

S. N.	Road/Footpath	Location From km to km	Length (M)	Width (M)	Remarks
1	Road (Stations)	-	5800.00 M	5.00 M	
2	Road (Stations)	Circulating area at each station	72.00 M	11.00 M	
3	Road	Madhubani Yard	600 M	7.50 M	TSS & OHE/PSI Depot
4	Road	Jataha Yard	600 M	7.5 M	SSP

Note: -

1. Service roads, internal colony roads, approach roads, and footpaths shall be constructed at the specified locations and in accordance with the lengths and widths provided in the approved Engineering Scale Plans (ESPs) attached. Roads serving goods sidings shall be designed with due consideration for heavy loads of transportation of transformers and traffic. The details provided in the 'ESP of Station Yard' are indicative, approximate, and for guidance only. The Contractor shall review, revalidate, and finalize these details based on their own design and planning. Any modifications shall ensure conformity with the applicable design criteria, specifications, standards, and best practices, and shall be subject to the approval of the Authority Engineer and the Authority.
2. The newly constructed approach road shall be integrated with the nearest existing approach road, based on site conditions. The Contractor shall ensure proper alignment and connectivity to facilitate smooth access.

1.11 Boundary walls, Boundary pillars

Railway Boundary Pillars shall be erected as per the provisions of the Indian Railway Works Manual. The Contractor shall provide safety barricading in accordance with Railway guidelines and instructions issued by the Authority Engineer, and shall ensure proper maintenance throughout the entire contract duration. RCC boundary pillars, 1.5 meters in height, shall be installed at intervals of 50 meters along the entire length of the boundary.

A Boundary Wall of minimum 1.8 meters height shall be constructed at yard approaches and block sections that are vulnerable to encroachment,



trespassing, or nuisance by local or outside persons, as deemed necessary by the Authority Engineer and in accordance with the agreed and approved 'Engineering Scale Plan (ESP) of the Station Yard'.

Note:

- (i) The total length of Boundary wall will be approximately 3800 M.
- (ii) The boundary wall shall consist of RCC columns with brickwork in between, constructed to a height of 2 metres above plinth.

The details provided in the 'ESP of the Station Yard' are indicative, approximate, and for guidance only. The Contractor shall review, revalidate, and finalize these details in accordance with their own design and planning. Any modifications shall conform to the applicable design criteria, specifications, standards, and best practices, subject to approval by the Authority Engineer and the Authority.

1.12 Signage information boards and posts

All the signage, information boards, and posts shall be provided which include road sign board, km, gradient, curve, SEJ, Point and crossing, station, bridge, colony, W/L, Speed Restriction, Caution, TP/TG, train indication Board (TIB), utility boards (such as cloak room, parcel, waiting rooms), Platform Indication Board (PIB) such as station name and service buildings required in block section. All Signages should be as per Railway Board's Specifications as per Rly Board's letter No.2023/SD-II/22/07/02 Dt.15.05.2023. Upon completion of the track installation following permanent markers shall be provided as per IRPWM and prior approval by the Authority's Engineer of their information, plates/boards, colour scheme and fixation arrangement, the list is indicative only:

- a) Kilometre markers;
- b) Change of gradient markers;
- c) Curve reference markers;
- d) LWR/CWR reference markers;
- e) SEJ markers including its reference markers;
- f) Fouling point markers;
- g) Turnout markers.
- h) Land boundary pillars in accordance with good industry practice.
- i) Level crossing markers
- j) Mandatory “W” boards for level crossings
- k) Bridge boards/signages
- l) Fog signal locations
- m) Station Name Board
- n) All markers required to be painted on rails for curves, turnouts and SEJs shall be paint marked by the Contractor as per IRPWM.

1.13 Drainage along the railway line



The Contractor shall design and construct surface and sub-surface drainage systems along the entire alignment, including all related works as deemed necessary, to ensure effective drainage and prevent water logging within the block section. The cross-sections of the drains shall be designed by the Contractor and submitted for approval to the Authority Engineer.

Drains shall be constructed using either precast or cast-in-situ RCC structures, depending on site conditions, functional requirements or as per drawing provided by the authority. All designs and specifications shall conform to the relevant provisions of Indian Railway codes, manuals, and RDSO guidelines.

S.N.	Location	Chainage		Length (m)	Drg No.
		From	To		
1	Longitudinal Drain	As per site requirement		5500m	CE/CON./Plan No. S/CTE-TOI/Drain/07/2025

- (i) Total length of Drain in Yards (all three yards) between Tracks shall be **2400 m** in length, with a drain width of 450 mm, to be constructed in accordance with Drawing No. CE/CON/Plan No. S/CTE-TOI/Drain/07/2025.
- (ii) Total length of Drain for Circulating Area (in all 3 stations) shall be **2100 m** in length, with a drain width of 1000 mm, to be constructed in accordance with Drawing No. CE/CON/Plan No. S/CTE-TOI/Drain/07/2025.
- (iii) Total length of Connecting Drain at Staff Quarters (three stations) shall be **1000 m** in length, with a drain width of 300 mm, to be constructed in accordance with Drawing No. CE/CON/Plan No. S/CTE-TOI/Drain/07/2025.

Note:- Provision of approximately 5,500 meters of drains along and between tracks, both within station yards and in section areas, shall be made by the Contractor. The quantity mentioned above is tentative and also includes drain to be provided in circulating area and in staff quarters campus. All data and information provided are indicative and for guidance only. The Contractor shall conduct detailed site investigations to re-check, verify, and modify the proposed drainage works to suit actual site conditions, subject to approval by the Authority Engineer and the Authority. Longitudinal drains within the yard shall be connected to cross drains on both sides. The sections of the cross drains shall be designed as per site requirements and shall be approved by the Authority Engineer.

1.14 Embankment/slope protection works



(i) **Requirement of retaining walls/ Toe wall:** - Retaining walls or toe walls for effective embankment protection shall be provided as per site requirements, based on approved designs and drawings. In the block section, retaining/toe walls shall be constructed at locations where sufficient land is not available for the embankment toe, as per the final alignment plan, available right of way, and other identified critical locations, subject to approval by the Authority Engineer.

(a) As per standard engineering practice, a retaining wall shall be provided only at those locations where the ROW is insufficient and the formation toe extends beyond the available ROW, making it significant and technically necessary. An indicative Drawing No. W/CON/29/325/W-1 is enclosed for reference.

(ii) **Requirement of Boulder pitching -**

Stone pitching for effective embankment protection shall be provided as per the final approved design and drawings, as required at site and subject to the approval of the Authority Engineer.

The specifications and standards for boulder pitching shall conform to the provisions of the Indian Railway Bridge Manual and other applicable guidelines as approved by the Authority Engineer.

1. Boulder pitching with toe walls shall be provided on all sides of all bridges, in accordance with the approved General Arrangement Drawings (GADs). At locations where the flow of water runs along the toe of the embankment, the extent of pitching shall be increased to ensure adequate bank protection, as directed by the Authority Engineer.
2. For embankments at vulnerable locations of water logging, stream flowing parallel to track or similar situations, stone pitching/Boulder crates shall be provided as per decision of Authority Engineer. Additionally, the required slope protection in the section shall be provided by the Contractor as per the approved design and as directed by the Authority Engineer.
3. Requirement of turfing: Suitable protection measures against embankment and slope erosion, such as turfing, geo-grids, or other approved techniques, shall be provided in accordance with the latest RDSO guidelines and approved drawings, as directed by the Authority Engineer.

1.15 Supply of Materials and Stores

(a) Arranging semi skilled and skilled labors (2275 Mandays) by the Contractor as and when required by the Engineer incharge, for various works i.e. receiving, issuing, safe guarding & supervision for P.Way works under SSE/P.Way, with contractor's T&P, equipments, hand signal flags as per specifications and instructions from Authority Engineer. If labor is not



provided to authority within 3 days of demand date Rs 1000/-per mandays will be deducted.

- (b) Contractor shall be responsible for unloading and stacking of Free Rails, Rail panels in Depot/station/Mid Section/between Stations in neat manner for railway uses from departmental material trains.
- (c) Contractor shall provide six (6) multi-utility vehicles for a period of 24 months. Each vehicle shall have a minimum load capacity of 1 MT and a seating capacity for 4 to 6 persons. The vehicles shall be made available for running up to 2,500 km per month per vehicle.
- (d) The following P-way material inventory shall be supplied by the Contractor at the time of commissioning:

Inventory for Supply of Materials			
S. N.	Particulars	Unit	Quantity
1	Supply of P.Way Components GFN Liners to RDSO Drg. No. T-3706	Each	1200
2	Supply of Glued insulated rail joint 60 KG Kg rail section as per RDSO Drg No. RDSO/T 5843	Each	20
3	Supply of PSC sleepers for SEJ as per RDSO Drawing No. T-4149 for 60 KG rail.	Set	3
4	Supplying at site of work including leading, loading, unloading and stacking of Special PSC Monoblock Sleepers (pre-tensioned type) for B.G. 1 in 8.5 Derailing Switch as per RDSO Drg. No.-T- 6068 to suite both 52/60 in rail or per RDSO Design and IRS specification No. T. 4596 2nd Edition) as amended from time to time with contractor's labour, materials, tools & Plant, equipment and machinery, transport etc complete.	Set	1
5	Supplying at site of work including leading, loading, unloading and stacking PSC turnout sleepers and approach sleepers for fanshaped layout of 60 kg 1 in 12 turnout for B.G 60 Kg. (UIC) rail/52 kg rails to ROSO Drg. No. 1-4218 Alt-5 (for general layout) and drawings thereof with latest alterations if any, complete set with contractor's labour, materials, tools & Plant, equipment and machinery, transport etc. complete	Set	1
6	Manufacturing and supply of Self Propelled Light Weight Trolley as per RDSO Specification No. TM/SM/28 Rev. 01 of 2004 with latest amendment.	Set	1
7	Supply of Grooved Rubber Sole Plates for 1 in 12 turnouts for layout Drg. No T-4218 with latest alterations if any, complete set for the turnout as per IRS specifiatio for Groveed Rubber Sole Plate (6mm thick) for placing beneath rails Sl. No. T-47-2006 with up to date corrigendum if any.	Set	1
8	Supply of GFN liners confirming to RDSO Drg. No T-8751 for Wider Base Sleepers	Each	6000



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Inventory for Supply of Materials			
S. N.	Particulars	Unit	Quantity
9	Supply of Composite Grooved Rubber Sole Plates (CGRSP) confirming to RDSO Drg. No. T-8747 for wider base sleepers.	Each	12544
10	Supply of PSC sleepers (wider base) for bridges with provisions for guard rails as per RDSO Drawing NO. T-8970 for 60 Kg rails.	Each	100
11	Supply of PSC sleepers (wider base) for bridge approaches with provisions for guard rails as per RDSO drawing No. T8971 to T-8978 for 60 Kg rail.	Set	2
12	Supply of P.Way Components ERC to RDSO Drg. No.T-3701	Each	1000
13	Supply of P.Way Components ERC "J" to RDSO Drg. No.T-4158	Each	70
14	Supply of Fish plates 52 KG as per Drawing No. T-090 (M)	Each	10000
15	Supply of Combination fish plates 1 meter long (4 Nos. per set) as per Drawing No.T696 to T699 including nuts, bolts and washers For 60 KG & 52 KG Rail Sections	Set	1
16	Supply of fish bolts with nuts for 60 KG, 52 KG rails as per RDSO Drawing No.T-1899, T-11501.	Each	200
17	Supply of jogged fish plates (2 No. per set) with 4 pair clamps, 4 No. Bolts & Nuts and 8 No. special washers. For 60 KG as per RDSO Drawing No. T 4016/T 5840	Set	30
18	Supply of Fish plates ONE meter long as per standard drawing of KD30 60 KG rail (As per RDSO Drg.No.T-5916/T-5851)	Each	30
19	Supply of Fish plates ONE meter long as per standard drawing of KD30 Supply of screw clamps for fish plates as per RDSO Drg No. T-5856	Each	80
20	Supply of 60kg 1 in 12 TWS switch confirming RDSO Drg. No. T-6155 with latest alterations, if any complete with all parts as listed in the drawing with check rails (excluding fish plates, Fish bolts & nuts, GRSPs, Liners and ERCs). LH	Set	1
21	Supply of 60kg 1 in 12 TWS switch confirming RDSO Drg. No. T-6155 with latest alterations, if any complete with all parts as listed in the drawing with check rails (excluding fish plates, Fish bolts & nuts, GRSPs, Liners and ERCs). RH	Set	1



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Inventory for Supply of Materials			
S. N.	Particulars	Unit	Quantity
22	Supply of 60 KG 1 in 8 1/2 Derailing Switch conforming to RDSO Drg No. 6068 with latest alteration, if any complete with all parts as listed in the drawing including GRSPs (excluding fish plates, fish bolts & nuts, Liners and ERCs). RH	Set	1
23	Supply of 60 kg CMS Crossing for 1 in 12 PSC Layout conforming to Drg. No. T-4220 with latest alterations complete with all parts as listed in the drawing (excluding fish plates, fish bolts & nuts, GRSPs, Liners and ERCs).	Numbers	1
24	Fabricating & supplying of 60 Kg improved SEJ with 65 mm max. gap as per Drawing No. RDSO/1-6922 with latest alteration including all fixtures and fastenings etc complete as directed by Engineer-in-charge	Set	3
25	Supply of ERC MK V conforming to RDSO Urg. No. I 5919 for Wider Base Sleepers.	Each	24000
26	Supply of PSC wider sleeper T-8746	Each	6000
27	Fish bolt 25*160	Each	15
28	Combination SEJ 60/52KG T-6782 with all fittings	Set	1
29	Metal liner T-8748	Each	19240
30	Plate screw T-3912	Each	430
31	Plate screw T-3913/3001	Each	185
32	Single coil spring washer T-10773	Each	3000
33	TWS switch clamp 60 KG	Each	3
34	Metal liner T-8749/8750 for 52 KG rail on PSC wider sleeper T-8746	Each	20000
35	Goods, Designing, Manufacturing, Supplying, Installation and Field Trial of 1 in 12 Canted Turnout with Thick Web Switch, Weldable CMS Crossing, PSC Sleepers & all Fastenings along with, Lead Rails, Back Driving Assembly compatible with Indian Railway Standards (IRS) type of point machine on IR for 60 kg track, including all fittings, fastenings, fixtures, stretcher bars etc. as required with complete arrangement, excluding 'point machines, rodding's & clamp locks', meeting the laid-down requirements i.e. Functional Requirements and Specifications issued by RDSO and undertaking the field trials as applicable for:-Canted Turnouts fit for speed potential of 45 kmph on diverging line. (It is mandatory that there should be no change in the yard layout for laying such canted turnouts i.e. the canted turnouts should be compatible for the existing yards. In case of crossovers, the centre to centre distance shall be 5.3m.)	Set	1
36	Abressive Rail Cutter	Set	8
37	Abreshive rail cutting Wheel	Each	200
38	Rail Drilling Machine	set	4
39	Track Jack(Mechanical)	Each	8



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Inventory for Supply of Materials			
S. N.	Particulars	Unit	Quantity
40	Track Jack(Hydraulic)	Each	8
41	Heavy Dutey Hydraulic Extractor for Jammed ERC(10 T)	set	2
42	SKV Welding Equipment Set	Each	4
43	Portable DC Welding Generator	Each	4
44	Chanfering Kitr(Manual/Battery Opt)	Each	8
45	Light Weight Rail(mono Cum Raod Trolley0	Each	16
46	BG Push Trolley With Umbrella	Each	4
47	Magentic Base type Rail Thermometer	Each	8
48	Continuous Rail Thermameter	Each	2
49	TOE Load measuring Device(Electronic/Mechanical)	cum	4
50	Insulated Trach Gauge With Sprit Level	cum	16
51	PWI Tool Kit	Each	4
52	Spanner(90R/52Kg/60Kg)	Each	16
53	Box Spanner	Each	16
54	Roller For Destressing	Each	100
55	Gang/Worksite Remote control Hooter	Each	4
56	Off Track Tamper (PowerPack/Engine Mounted)	Each	8
57	Weld Trimmer	Each	4

Note: All above items will be handed over in a new condition along with invoices.

1.16 Compulsory afforestation and tree plantation

Compensatory afforestation, including the planting of the required number of trees, shall be carried out by the Contractor in compliance with applicable rules and regulations of the respective State Government and in accordance with relevant directives issued by the concerned Government Instrumentality.

1.17 Any other requirements: N/A

1.18 Change of Scope

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



NOTE: The data and information provided above are indicative and for guidance only. These should be re-checked, verified and modify the same duly approved by authority’s engineer and authority.

1.19 Transportation /Shifting of P. Way material.

- 1.19.1 Service rails and SH rails in 13m-6.5m will be issued to the contractor. The contractor will have to lift & transport the Rails issued by Railway from any section/ Depot in Varanasi Division or on any suitable place in zonal railway or nearby railway. New 60 kg Rail will be transported through the Departmental Material Train (DMT). Unloading of New 60 kg Rail will be done by contractor at site and nothing extra will be paid for unloading of New 60 kg rails.
- 1.19.2 All types of Sleepers shall be supplied and transported by contractor at site at his own cost, nothing extra will be paid for transportation, leading, loading/unloading of sleepers.
- 1.19.3 In continuation to clause 1.19.2 mentioned above, all P. Way material such as SEJ/Glued Joints/Check Rails, Points-Crossings, Tie Bars will be transported by contractor at site at his own cost and nothing extra will be paid for transportation, leading, loading/unloading of these P.Way materials.
- 1.19.4 Transportation/Shifting of Rails Payment of loading, transportation and unloading of Service rails and SH rails in 13m-6.5m will be done on the basis of actual work done. Payment of loading and unloading will be done in proportionate MT and transportation of Service rails and SH rails in 13m-6.5m will be done in proportionate MTKM under Schedule G in item no. 1. 10.6 (Transportation/shifting of Rails).

2. Signalling and telecommunication

The details of signaling works for new line from Paniahwa - Madhubani are as:

2.1 Signalling works

- 2.1.1 All signalling works including Survey, design, supply, installation, testing and commissioning shall be executed in accordance with the provisions of the Indian Railway Signal Engineering Manual.

CHHITAUNI – MADHUBANI STATION DETAILS: -

S.N.	Equipment Description	Scope of Work
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EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Equipment Description	Scope of Work
1.	Electronic Interlocking or Relay Interlocking equipment	New Electronic Interlocking to be provided in Chhitauni, Jataha and Madhubani as per Approved SIP. The system design shall Cater for minimum 20% increase in quantity of field gears without addition of any module/cards except relay/wiring material.
2.	Power supply system	(i) At Chhitauni : New IPS to be installed with AT panel, class A arrestor & adding necessary module. (ii) At Jataha : New IPS to be installed with AT panel, class A arrestor & adding necessary module (iii) At Madhubani : New IPS to be installed with AT panel, class A arrestor & adding necessary module
3.	Data logger System	(i) 01 Data logger with 512 digital 32 analog input including power supply arrangement with printer and maintenance console (core i5 or higher) at Chhitauni station. (ii) 01 Data logger with 512 digital 32 analog input including power supply arrangement with printer and maintenance console (core i5 or higher) at Jataha station. (iii) 01 Data logger with 512 digital 32 analog input including power supply arrangement with printer and maintenance console (core i5 or higher) at Madhubani station.
4.	Signalling & Quad Cable	Signalling & quad Cable to be provided as per approved cable cordage plan with minimum 20% spare conductor/core. One 6 Quad to be laid along the track with provision of emergency socket, control phone, TPC, IBS communication (SPT), SP/SSP/TSS (with provision of SCADA Communication.)
5.	Relay	As per design requirement.
6.	ELD	To be provided at Chhitauni, Jataha, Madhubani with minimum 16 AC/DC Channel at all places.
7.	Fire alarm system	To be provided at Chhitauni , Jataha, Madhubani .(Minimum total 21 reset table addressable multi heat and smoke senser.) This set also include supply of 6 CO2 type fire extinguisher of 4.5 Kg. capacity.



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S.N.	Equipment Description	Scope of Work
8.	Fuse auto change over system	Complete system to be provided at Chhitauni, Jataha and Madhubani
9.	LC Gate	Nil
10.	Signal with Complete accessories	As per approved SIP with FRP Unit.
11.	Earthing	At per NER practice for outdoor gear and OEM requirement for indoor gears as per latest TAN.
12.	Spare	10% of all signalling item such as LED, Relays, auto change over to be provided.
12.	OFC	Total Two Nos. of 48 fibres optical fibre cable one number of each side as per Site requirement as per latest RDSO specification and NER standard practice has to be laid in entire section along the track in UP & DN Direction both via station, All optical fibre cable should be laid in HDPE pipe using blowing method and to be terminated at FDMS in OFC hut/RH and SP/SSP/TSS in Chhitauni station & Jataha and Madhubani OFC hut. All necessary interface/Hardwares will be provided by the tenderer to make the system functional. In case, where existing fiber joint is far away from RH, a joint will be made near RH in existing fiber by tenderer wherever required.
14.	HASSDAC & MASDAC	As per Tentative SIP. (MSDAC will be in Redundancy with DC Track Circuit in Yard)
15.	UFSBI	Provision of UFSBI between Paniwala to Chhitauni to Jataha to Madhubani Station in redundant media mode.
16.	Integrated Testing and Commissioning	Design, supply, installation, testing & commissioning of all stations as per approved plan by Tendered to make full phase working of the Chhitauni & Jataha and Madhubani station.

2.1.2 Signalling works at stations

The details of signaling works at stations are:



SN	Description of work	Details of stations									Block arrangement with adjacent station
		Name of station	No of Lines	Std. of interlocking	Type of Signaling	Type of block working	Type of train detection system	Type of point operation & locking arrangement	Type of lifting barrier & locking arrangement	Details of siding	
1	Survey, design, supply of materials of EI as per RDSO specification no RDSO /SPN/192/2019 latest version, hot standby mode along with redundant i/o installation, testing, interlocking & commissioning of indoor and outdoor signaling equipments with centralized electronic interlocking at Chhitauni station and Jataha & Madhubani station of North Eastern Railway.	Chhitauni	3RL	STD III	EI	BPAC using UFSBI (S/L)	Axle counter (HASSD AC,MS DAC)	Electric point machine, Rotary locking.	NA	As per SIP	Using UFSBI
		Jataha	2RL	STD III	EI	BPAC using UFSBI (S/L)	Axle counter (HASSD AC,MS DAC)	Electric point machine, Rotary locking	NA	As per SIP	Using UFSBI
		Madhubani	2RL	STD III	EI	BPAC using UFSBI (S/L)	Axle counter (HASSD AC,MS DAC)	Electric point machine, Rotary locking	NA	As per SIP	Using UFSBI
2	INTEGRATED TESTING AND COMMISSIONING	Integrated testing and commissioning of all S&T and associated works confirming to TAN No.STS/E/TAN/3012 VER 3.0 Dated 28.06.2021 or latest version and Cyber Security no. EI/TAN/Security Ver.1.0 dated 01.03.2023 or latest version .Before taking the NI work railway board letter no. 2012/Sig/SF-2/Policy Dated 30.12.2016 will be complied by contractor. All documents related to CRS minor sanction will be made and provided by contractor as per NER practice.									

Construction must also include verification and validation of system installed and independent certification for maintenance and operation system during its life cycle. All other associated materials and works for completion not limited to items in the above table as required for execution of the signaling and telecom works to suit 25 KV has to be provided by the Contractor.

- (i) Cable laying policy issued by RB letter no. 2022/GS/IR/Cable laying policy dt. 29.03.2023 and NER letter no. NERHQ0SndT (SIG)/ 12/2020-O/O PCSTE/HQ/NER DT. 22.03.2022 is attached for reference.

2.2 Telecommunication

2.2.1 All telecommunication works including survey, design, supply, installation, testing and commissioning shall be executed in accordance with the provisions of the Indian Railway Telecom Manual.

2.2.2 Optic fibre cable system

Optic fibre cable supply, laying in trench in all types of soil including cable laying through trenchless technique for road/road crossing, jointing,



termination, testing and design, supply, installation, testing and commissioning of STM, PD Mux system including all associated control equipment to achieve the end goal.

2.2.3 Spare and Inventory

Spares and inventory must be supplied by contractor. (a) List of tools mentioned in Annexure A, B ,C & D.

2.3 Automatic Fire Alarm & Detection System & Automatic fire suppression system: Following to be provided under this tender-

Automatic Fire Alarm & Detection System as per RDSO SPECIFICATION No.: RDSO/SPN/217/2021 Ver.3.0 or latest (if any)			
1	Chhitauni Station	1	1 No. of EI CENTRAL BUILDING.(All S&T rooms)
2	Jataha Station	1	1 No. of EI CENTRAL BUILDING.(All S&T rooms)
3	Madhubani Station	1	1 No. of EI CENTRAL BUILDING.(All S&T rooms)

2.4 Fuse Auto changeover system (FACS) as per RDSO Specification No. RDSO/SPN/209/2012 Ver.2.0: Following to be provided under this tender-

Way Side Stations		Way Side Stations		Way Side Stations	
STN	Name of Stations	STN	Name of Stations	STN	Name of Stations
1	Chhitauni Station	1	Jataha Station	1	Madhubani Station

2.5 Maintenance Free Earthing & Surge Protection System:

SN	Name of Stations	SN	Name of Stations	SN	Name of Stations
1	Chhitauni Station	1	Jataha Station	1	Madhubani Station

The Contractor’s scope of work shall include, but shall not be limited to, the following (the details provided below shall be referred to for the purposes of Annexure–E):

Major activities are given as under:

1. Design, submission and approval of Route control Chart, Application Logic, Interface Circuit, Cable Route Plan, Cable core plan, Location drawings, and Completion drawings.



- 1.1 Submission of EI documents (manuals for installation, testing, commissioning and maintenance of the system, completion document). (One set consist of 6 sets of following drawing per station).
 - (i). Manuals for installation, testing, commissioning and maintenance of the system for technicians/Jr. Engineers (installation and maintenance level).
 - (ii). Technical system module for diagnostic & trouble shooting for repair centre (Engineers level).
 - (iii). Functioning and system overview (higher management level).
- 1.2 Preparation of field drawing such as cable route plan, cable core plan, and Power supply lay out, cable termination chart in relay room & location boxes, location wiring diagrams, fuse analysis, equipment disposition plan, track bonding & insulation plan as per railway practice. **Note:** all the above diagrams /plans to be submitted in polyester film tracing to the railway. The contractor shall also supply 6 sets of photo/Ferro print copy of said plans / drawings out of which 1 set shall be duly laminated.
- 1.3 Preparation and printing of station working rule diagram (SWRD) on auto cad based on approved SIP, ESP. As per the extant practice being followed in N.E. Railway Varanasi Division. Contractor shall supply one print of SWRD (paper print size as required) as draft for approval and comments. Once the approval is given, contractor shall supply tracing of the SWRD on good quality film paper of thickness not less than 75 micron for signature of all officials. On approval the contractor shall supply 10 copies blue print of tracing. The approved SWRD shall be finally supplied in 2 pen drives.
- 1.4 Preparation of station working rule (SWR) including appendix- a, b, c, d, e, f and g in Hindi and English on approved SIP/ESP/ST/SWRD/PD/VDU layout. As per the extant practice being followed in N.E.RAILWAY. Contractor shall supply two paper print of the SWR as draft for approval and comments. Once the approval is given he shall supply two set paper prints of the SWR for final approval and signature of the concerned officials on obtaining final approval , the contractor shall supply 10 sets of the swr and 1 set gate working rule (GWR) of each LC gate (app.-a) duly photocopies of SWR. The approved SWR shall be finally supplied in 2 pen drives.
- 1.5 Final location survey of cable route and final preparation of route plan as per code of practice for installation & commissioning of optic fiber & Quad cable system (STT/FO/1 issued by RDSO, Lucknow) including supply of final cable route plan giving all necessary details in 5 No. hard bound copies on white bond paper of A3 size.
- 1.6 Contractor has to provide all the drawings as per Schedule – H of Annexure – I
- 1.7 Design, Supply, Installation, Testing and Commissioning of Electronic Interlocking (EI) equipment complete (Hot standby configuration) with redundant I/O conforming to latest RDSO specification RDSO/SPN/192/2019/VER-2 or latest (with latest amendment if any). The



works Chhitauni to Madhubani New Line Section at Chhitauni station and Jataha Station & Madhubani Station of North Eastern Railway shall include but not limited to:

- A. Design, Manufacture, Supply of Hot Standby Architecture Electronic Interlocking (EI) System Complete as Per RDSO Specification RDSO/SPN/192/2019 Ver.2 or Latest (with Latest Amendment if any), for Chhitauni, Jataha and Madhubani Station. Mainly Consisting of Microprocessor Based CPU Card, Input Card, Output Card, Interfacing Equipment, Suitable for RE. Operation through Dual Embedded Industrial Grade PCS VDU Panels 55" 4K HD LED Operating Console (06 No.) Including Furniture, Printer and UPS. As Per RDSO TAN No. STS/E/TAN/3012 Ver 3.0 Dated 28.06.2021 And 55" 4K HD LED Maintenance Console (03 No.) Including Furniture, Printer And UPS As Per RDSO TAN No. STS/E/TAN/3012 Ver 3.0 Dated 28.06.2021 or Larger With UPS Backup Minimum 1 Hour Backup & VDU Inverter Alongwith Suitable Table & VDU Cover for VDU Panels and Maintenance Console As Per Site Requirement (The Make And Model Number Should be got Approved by Railway's Site Engineer Prior To Supply), Interconnecting Cable, Rack for EI Card, Relay Rack, CT Rack (Including Terminals), Connector, Fixtures, Mounting Arrangement, Lightning Arrestor, Maintenance Free Earth & Accessories Necessary To Make Electronic Interlocking System Functional as per Approved Signal Interlocking Plan (SIP), Design of Circuits And Preparation of Wiring Diagrams, Power Supply Arrangement on Main Cabin & All RHS, OFC Connectivity (PATCH CORDS) As Per Requirement of System, Protocol Converter for Dataloggers at Chhitauni, Jataha and Madhubani Station and any other Necessary Item Required for Working of EI Installation will be Supplied and Installed by Contractor.
- B. Supply, Installation & Testing of EI Equipment, Consisting of Microprocessor Equipments, Interface Equipments, EI Vendor specific interfacing relays, In-Built event logger, In-Built Power Supply Equipments, Racks (Relay Rack/EI Rack/CT Rack Including Screw Less Disconnect Terminals make Wago/Phoenixs/Similar), Indoor Cables, Wires, Fuses, Fixtures, Mounting Arrangements Along with all accessories required to make complete EI system functional will be provided by contractor.
- C. These specifications/ documents describe the material to be supplied, work to be performed and the method of construction for the complete installation in strict accordance with the drawings and specifications mentioned here in and such instructions as may from time to time be given by the Railway. The contractor shall quote for work giving all information after close scrutiny of the plans and site survey.
- D. The Electronic Interlocking systems being offered against this tender shall be from RDSO approved Part I or Part II or from sources approved for field trial by RDSO within the approved quantity. "Under taking by the tenderer" that the equipment for EI shall be procured from RDSO approved sources and



installation, testing and commissioning of EI shall also be got done from the same source including after sales support required during the warranty period should be submitted.

The Contractor will ensure: -

- E. Installation, Wiring, Programming, Testing & Commissioning of Complete Yard Both Indoor & Outdoor for Data In-Put & Configuration, Simulation & Functional Testing, Diagnostic & Trouble Shooting And Commissioning of Electronic Interlocking System as per Interlocking Plan.
- F. Supply and Installation of Ring Earth (Maintenance Free Earth) Arrangement as per RDSO Specification No. RDSO/SPN/197 Version 1.0 or Latest (with Latest Amendment if any) for Above EI System For All Three Locations. Supply of All Required Materials As Per Latest RDSO Guide Line.
- G. Supply and installation of all type of Relays to make EI Functional.
- H. Supply and installation of interconnecting cables and interfacing Equipment required for interfacing the EI with outdoor gears, Digital Axle Counter System, Data Logger system, Block proving Axle counter system, monitoring of power pack as per load calculation.
- I. Supply of Hot standby of suitable capacity VDU UPS for 2 Hrs. back up.
- J. Supply and installation of all types of consumables, Optical cables along with interfacing equipment, wirings, tag blocks, connectors and protective devices (like Fuses, Lightning arrestors and surge protection arrangement, equipotential bonding) to make Electronic Interlocking (EI) system functional.
- K. Supply and Installation of A, B & C class lighting & surge arrestors at EI Huts.
- L. Furniture: modular furniture of pyrotech workspace or Cosmos Make or superior, new modular control desk for provision of control desk for dual operator PC (Set of dual VDU, comprising of 03 Nos. 55 inches VDU each, Block Instrument, Control telephone, PA System) in "SLAT" system customaries for station as per Floor plan of station. This item includes : (i) Desktop made of 12 mm ASS + ASS 12 mm MDF (ii) structure : powder coated aluminium sturdy structure and extreme side aesthetic legs (iii) shutters : 18mm MDF (iv) proper cooling arrangement for CPR cabinet (v) 2mm thick extruded aluminium "SLAT" wall . The workspace will be provided for storage in SLAT system, this includes space for housing two numbers of embedded PC, 2 No. of FDMS and their power supply arrangement with proper ventilation. This includes supply of two chairs (Godrej PCH 7002 D or superior, as approved by Engineer in charge) for operators. Apart from this, new modular control desk for provision of Maintenance control desk for 65 inches Maintenance PC for maintenance staff to be supplied & installed at station along with Chair: Godrej make PCH-7003 premium Executive chair or Similar (Inspected by consignee). (1 No per Hut/Station). Drawing in this regard is required to be submitted and got approved from executive in charge before supply.



- a. Laser Jet printer (size A4, minimum 20 copies per minute, black and white) suggested brand- HP/DELL/CANON (Inspection by consignee)- 1No. with each Diagnostic PC.
- b. Table: Godrej make interio Companion C3 Engineered Wood computer desk or similar (Inspected by consignee). (per Central Cabin & Huts(Auto/EI)
- c. Chair: Godrej make PCH-7003 premium Executive chair or Similar (Inspected by consignee) per Central Cabin.

2. S&T Cables.

2.1 Supply of Cables, Excavation of Trench, cable laying & backfilling including all Protective works as given below:-

- 2.1.1 Supply & Laying of Signalling cables, Power cables, Quad cables and 48 Fibre Optical Fiber cable at stations as per NER Practice.
- 2.1.2 Excavation, Trenching and laying of Signalling, Quad , Power cable and OFC cable as per design consideration (minimum depth 1.2 metre), including jointing, terminating, splicing and testing of OFC cable along with accessories and associated works. Practice as mentioned in Telecom Manual, RDSO guidelines, Zonal Railway technical guideline on trenching, laying and protection of cable to be followed.

Note:- (i) Signalling (12C x 1.5Sq. mm), Quad (6-Quad 0.9 mm dia), Signalling (6C x 1.5Sq. mm) & OFC (48-Fibre) or other required cable will be supplied by the Contractor (ii) Re-instatement of platform, pucca road to original state after laying of cable,

- 2.1.3 Excavation of trench in all type of soil and laying of cables as per NER Practice.
- 2.1.4 Jointing/ termination of OFC/Quad/signalling cable along with jointing material required.
- 2.1.5 Trenching under track (Track Crossing), Road (Road Crossing) and on Platform shall be done through Horizontal Directional Drilling (HDD) or by any means including supply and insertion of self-lubricated HDPE Pipe of suitable dia.
- 2.1.6 Cables are required to be laid through GI pipe [100 mm dia, 4.5 mm thickness and as per IS 1239 (Part 1) : 2004 or latest] over the Bridges and also at places where required, with the supply of GI pipe & requisite materials by the contractor.
- 2.1.7 48-F OFC should be conforming to IRS:TC:55/2006, Rev.1 with latest amendment as on date of tender opening, shall be supplied and laid in 40mm HDPE pipe conforming to RDSO Spec. No. RDSO/SPN/TC/45/2013 REVISION 2.0 with latest amendments or Latest spec. on date of tender opening using



- blowing method by the contractor along with necessary termination and networking.
- 2.1.8 Digging of cable pit (minimum inside size of 3m x 3m x 2m) and construction of brick wall for pit along with pit cover or prefabricated pit of required size near relay room for keeping loop of cables.
- 2.1.9 Cutting of all types of Roads/Platforms/Concrete preparatory and repairing of the same to original state after cable laying work.
- 2.1.10 Connection of Paniahwa(Excl) to Chhitauni EI to Jataha EI to Madhubani EI, to be done through Dual OFC with path redundancy.
- 2.2 Delivery of cable protection items e.g. Ducts, pipes and provision of route markers
- 2.2.1 Fabrication, Supply and Fixing of Cable Route Marker of 1:2:3 Concrete as per DRG No-CST/OL.S.K.No.NER/GKP/SK/CM/2017Dt.29-05-2017. The marker shall be fixed at various places of cable route as per instruction of site engineer. (Minimum 600 No.)
- 2.2.2 Electronic RFID based Route marker for S&T Cable with programmable memory for saving the user specific data which can be buried up to depth of 1.2 Meter shall be provided at every 100 meter on cable route (3M make model EMS-1421-XR/ID or superior.
- 2.2.3 All Signalling cables/Quad should be laid in ducts/DWC pipes.
- 2.2.4 OFC cable should be laid in HDPE pipes.
- 3. Supply, Installation, Testing and Commissioning of below indoor systems at stations / sections:-**
- 3.1 Microprocessor based Data Logger with 512 Digital & 32 Analog Inputs for Central EI building at Chhitauni & Jataha & Madhubani including protocol converter, Leased line MODEM for networking along with computer table, printer.
- 3.2 Power Supply arrangement, Power pack, duly approved by executive in charge catering for all S&T equipment of EI Central cabin at Chhitauni & Jataha & Madhubani and with redundant 110V/200AH LMLA batteries (1 set: 55 Nos. 2V/200AH cells) with minimum warranty of 5 years.
- 3.3 Supply, Installation, Transportation, Testing, Execution and Commissioning of Block Proving by Axle Counter (BPAC) using Block panel and UFSBI for Single line Operation as per Spec No. IRS: S-105/2012 (ver.0) with latest amdt. Each Pair consisting of followings:
- Universal Fail safe Block interface complete with all accessory as per Spec No IRS S-104/2012 (ver.0) with latest amdt. Qty- 03 pairs.
 - Block panel complete with all accessory as per RDSO Org No RDSO/S/32019 for single line (latest amdt)- Qty-03 nos.
 - Relay rack with double locking and arrangement as per RDSO Drg



- No. RDSO/S/32020 including supply of relays for relay rack (QN1-295 nos, QNA1-106 nos, QBCA1-44 nos, ECR Relay-134 nos, KLCR Relay-8 nos, Relay Fresher- 3 nos, QSPA1-53 nos QL1-3 nos & Timer Relay 6 nos) Qty and wiring as per RDSO's wiring diagram No. RDSO/S/32020 with latest amendment.
- iv. Block Telephone with accessory as per RDSO Spec No. RDSO/SPN/191/2006, each station with all type lighting protection and inbuilt automatic media change over with voice. E1 and dark fiber port. (Inspection by RDSO) OR (B) Supply, Installation, Transportation, Testing. Execution and Commissioning of microprocessor based Station Master Block Panel for Single line Block instrument with Block telephone as per RDSO SPN/175/2005 Ver.-1 or latest with automatic media change over. Each Pair consisting of following (1) Supply of (a) Microprocessor based Station Master Block Panel for Single line instrument with block telephone as per RDSO/SPN/175/2005- ver1 or latest (b) Block Telephone RDSO/SPN/191/2005 (Ver.-0) or latest. (Inspection by RDSO), for each station Supply of Microprocessor based SSBPAC (D)Block instrument for single line as per RDSO/SPN/175/2005 ver1 (Inspection by RDSO), Qty-3nos (3) Supply of lighting and surge protection device for power line 24 V DC. Class-C (Inspection by Consignee), Qty-03Nos (4) Supply of lighting and surge protection device for Data line Class D (inspection by Consignee), Qty. 3Nos (5) Supply of all type of relays Qty 03 lots with inbuilt auto media changeover with voice, E1 and Dark fiber Port (Inspection by Consignee except Relays which will be inspected by RDSO) Block Proving with Axle Counter System using High Availability Single Section Digital Axle Counter (HASSDAC) System with UFSBI
- 3.4 Earth Leakage Detector for AC and DC Power Supplies shall be provided at Chhitauni & Jataha & Madhubani.
- 3.5 Fire Alaram System - To be provided at Chhitauni & Jataha and Madhubani connected to each other. Alarm should be accessed at Each station. (Minimum total 21 reset table addressable multi heat and smoke sensor.). These sets also include supply of 6 CO₂ type fire extinguishers of 4.5 Kg. capacities.
- 3.6 Provision of Fuse Auto Changeover system at each Station.
- 3.7 Provision of HASSDAC between Stations as per approved SIP.
- 3.8 Extension of Power from Power supply room/ RDSO Panel to various S&T equipment and provision of two nos. of power cable of required size for the same.
- 3.9 ED (Signal) Railway board letter no. 2023/Sig/17-Sig equip/maintenance/part dated 06.11.2023 will be followed for wiring description.
- 4. Supply, Installation, Testing and Commissioning of below outdoor systems at stations / sections:-**



- 4.1 Various Fibre-reinforced plastic (FRP) Signal units along with Post, Base, Ladder, Offset Bracket, Number plate, LED Signal Lighting Unit, Route Indicator and Hand cuff Locks complete for Main Signal and Shunt Signal.
- 4.2 Screen on signal by expended Metal size 20mm X 60mm as per site requirement.
- 4.3 Various Boards i.e. Goods Warning Board/Caution Board/Stop Board/Block Section Limit Board (BSLB)/Shunting Limit Board/change of Signalling territory board/Calling on board.
- 4.4 Various type of marker i.e. 'P', 'C', 'A', 'G', 'AG' and also illuminated A/AG marker.
- 4.5 Electric Point Machines (Rotatory locking type) including Threaded type Ground Connection & KLCR Relays.
- 4.6 Location Boxes / Apparatus Cases (Full Case / Half Case) with 'E' type locks with keys along with accessories i.e. Hylam Sheet, M6 type ARA / Wago / Disconnect type terminals, HRC Fuses with Fuse Block, Slotted angles, Wiring materials, lugs, switch, 3 pin socket, lamp holder along with lamp for termination of cables complete along with all accessories. This also includes Termination, Meggering & Testing of cable cores on Disconnect Type Terminals/ARA/Fuse Blocks in the Cable Termination Rack and Apparatus cases.
- 4.7 Maintenance Free Earthing & Normal (Conventional) Earthing with earth enclosures at required place as per Eastern Railway Practice.
- 4.8 Filling of earth around Apparatus cases / Signal posts as required.
- 4.9 Outdoor alteration work at existing locations along with suitable modification in existing shall be done by contractor along with all wiring material and items required for alteration/modifications.
- 4.10 10% spares of all type LEDs and Relays should be provided by contractor to Railways.
- 4.11 DC track circuit in yards as per SIP with FRP TLJB and MSDAC will be in Redundancy with DC Track Circuit in Yard.
- 4.12 ED (Signal) Railway board letter no. 2023/Sig/17-Sig equip/maintenance/part Dated 06.11.2023 will be followed for wiring description
- 5. Telecom indoor works (including installation and commissioning of OFC Hut to enable OFC and Quad communication between Stations/IBs, and provision of Telephones, Passenger amenities) to be carried out as per site requirement at each station given as below: -**
 - 5.1 Supply and Installation of Master telephone with voice record facility and slave phone at adjacent stations.
 - 5.2 Supply and Installation all kind of telephone/DTMF/ equipment required at panel room for operational purpose INCLUDING THE 25 W VHF SET.
 - 5.3 Provision of control telephones/other phones.
 - 5.4 Supply and installation of DP (Distribution point) boxes.
 - 5.5 PA System at Chhitauni, Jataha & Madhubani supported by central data controller with all accessories including supply and installation of necessities software as RDSO/SPN/TC/108/2019 with one hour power backup.
 - 5.6 Provision of OFC hut at Chhitauni, Jataha and Madhubani with the Managed



- STM4, primary digital drop insert MUX ,FDMS , 48 v VRLA power bank with SMPS BASED charger as per RDSO spec, make for link provision to UFSBI and HASSDAC With Suitable Mounting arrangement With Maintenance Free Earthing And Class B And Class C Surge Arrestor. All the E1 Derived from STM 4 will be terminated on DDF module 19” rack mountable – 32 E1 .All the 30 channel derived from PDI Mux will be terminated on KRONE distribution frame with Z protection for 30 channels. ALL the channels will be terminated on 32 U link panel for testing purpose.
- 5.7 Provision of Emergency Socket on Post As Per IRS:TC 42-87 With Latest Amendments Along With The Railway Track.
- 5.8 Supply Installation, testing and commissioning of Digital clock with GPS Synchronisation for office area as per RDSO Spec No. RDSO/(SPN/TC/ 62 /2008 Rev 3.0 or latest as per technical specification.
- 5.9 Supply Installation, testing and commissioning of GPS Based double face platform Digital clock as per RDSO Spec No. RDSO/SPN/TC /62 /2008 Rev 3.0.
- 5.10 SIL-4 MUX to be provided in Station/IBS for aspect repeating purpose.

6. Miscellaneous works to be carried on each station

- 6.1 Cleaning, painting and writing of various Indoor & Outdoor gears as per practice of NE Railway.
- 6.2 Preparation and planning of NI, Pre-NI, Post NI work, simulation panel arrangement for the same to complete the whole work. Making lighting and power arrangements for night working as per instruction of site engineer, if required.

7. Provision of S&T inventory and spares. Following items should be supplied and handed over to Railways by contractor –

- 7.1 SUPPLY OF ESSENTIAL SPARES (10% OF MAIN EQUIPMENT/MODULE FOR EI SYSTEM) OF THE INPUT CARDS/MODULES OF ELECTRONICS INTERLOCKING SYSTEM AT EACH STATION/IBS.
- 7.2 All inventory as mentioned below in Annexures A, B, C,D.

8. Maintenance and Training

- 8.1 Maintenance and troubleshooting of S&T gears and assets of entire section which is commissioned for 3 months from the date of commissioning by contractor. Maintenance of Signalling gears/assets and Gates/Main/Tail Signalling Cable. The work organise by team of Main Signal Cable test in disconnection, Tail Signal Cable test in disconnection/ Maintenance of Signalling gears/assets. The team to be provided for this work should comprise of Blacksmith - 01 No., Fitter - 01 No., Helper -04 No. It also includes any work of signalling gear/assets. Any other work as per instruction of Railway Engineer. All Tools &Plants required to execute the work will be supplied by the contractor.



- 8.2 Training on installations, maintenance & trouble shooting shall be imparted to Railway Personnel at site. Training shall be organized for OL and Construction staff & officers through the OEM/agency before commencement of work and proper record shall be maintained.
- a) During programming, testing and commissioning one more round of training shall be organized for the OL staff to have better understanding of the product going to be commissioned.
 - b) During the training each of the attendee shall be given copy of the training manual and copies of the approved document without any exception.
 - c) Training shall be organized for OL and Project staff & officers through the OEM/agency before commencement of work and proper record shall be maintained.
 - d) During programming, testing and commissioning one more round of training shall be organized for the OL staff to have better understanding of the product going to be commissioned.
 - e) During the training each of the attendee shall be given copy of the training manual and copies of the approved document without any exception.
9. **All the works shall be executed as per RDSO specifications with latest amendment and as per North Eastern Railway Practice.**
10. **All the materials shall be procured from RDSO approved vendors only. The material for which vendors are not approved by RDSO or do not have RDSO specifications shall be procured from reputed firms as per practice followed on Indian Railways with prior approval of North Eastern Railways.**
11. **Training for operation, maintenance and troubleshooting of EI and other S&T equipment as per clause 3.9.1 of article 3 of agreement.**
12. **Temporary work, if required, for Installation, Testing and Commissioning of the S&T gears at various stations along with associated section.**
13. **All the necessary co-ordination during CRS / PCSTE sanction / Inspection including paper submission, required number of copies of documents.**
14. **In addition to clause 11.7 of Article 11 of Agreement, Contractor shall submit a monthly progress report/PERT (Program evaluation & review technique) chart/ any other suitable project progress, work done during the month including projections/planning for the next month. An expert technical group consisting of representative of Railway and Project Manager of contractor will sort out technical complication, if any, arises during the course of execution.**
15. **Installation, testing & commissioning of various systems i.e. Electronic Interlocking (EI) System, Data logger System, Power Supply system,**



DLBI/TLBI, High Availability Single Section Digital Axle Counter (HASSDAC) System and MASDAC System shall be done by OEM's / Authorized OEM's representative. The Pre-commissioning check list should be jointly signed by OEM's / Authorized OEM's representative & Railway representative at site as per guidelines issued by RDSO.

Construction must also include verification and validation of system installed and independent certification for maintenance and operation system during its life cycle.

Any other activity required for completion of work to 25 KVA RE suit, functional & operational requirement under this contract is to be carried out by the bidder.

Note: - Bidder has to carry out their own survey, investigations and detail examination before submitting their Bid.

Annexure-A				
List of Tools for CHHITAUNI, JATAHA & MADHUBANI STATION Signaling				
SN	Description of Item/Make	Model/Product No.	Unit	Quantity
1	Kit Box-Venus (Adjustable Tool Box 5Layers) or similar.		Nos.	3
2	Continuity Buzzer or similar.		Nos.	3
3	Insulated flat plier 150 mm – Taparia or similar	1421-6	Nos.	3
4	Insulated flat plier 125 mm – Taparia or similar	1401	Nos.	3
5	Insulated side cutting plier 8"-Taparia or similar.	1101-8	Nos.	3
6	Combination plier 200 mm(insulated) or similar.	1621-8	Nos.	3
7	Insulated stripping plier 150mm or similar.	WS06	Nos.	3
8	Insulated nose-plier 160mm or similar.	1420-6/1421-6	Nos.	3
9	Monkey plier 10" or similar.	1225/1225N	Nos.	3
10	Screw Driver Set-Taparia or similar.	840	Set	3
11	Flat Chisel 175 X 20 mm / 200 X 25 mm- Taparia or similar.	1048	Nos.	3



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Annexure-A				
List of Tools for CHHITAUNI, JATAHA & MADHUBANI STATION Signaling				
12	Flat Chisel 100 X 10 mm / 150 X 20 mm-Taparia or similar.	1046	Nos.	3
13	Steel measuring tape 2 m-Freemans or similar.	2 meter	Nos.	3
14	Tin Cutter-Taparia or similar.	TCS12	Nos.	3
15	Box Spanner Set-Taparia or similar.	S-11M / S11H	Set	3
16	Adjustable Wrenches of different sizes-Taparia or similar.	(250, 300, 350, 450, 600 mm)	Set	3
17	Hammers of different sizes-Taparia or similar.	(WH 110, 200, 340, 500, 600, 800)	Set	3
18	Soldering Iron-Soldron or similar standard make or similar.	100-150 Watt	Nos.	3
19	Hand Drill machine with drill bits-Bosch or similar.	GSB 500	Nos.	3
20	500V Hand generator type/ push button type of reputed make or similar.		Nos.	3

Annexure-B				
EI TOOLS (For CHHITAUNI, JATAHA AND MADHUBANI STATION BREAKUP				
SN	Description	Unit	Quantity	Make
1	Plier Tools			
1.1	Insulated stripping plier 150mm	Nos.	3	Gedore/Jhalani/Taparia or similar
1.2	Insulated nose plier 150mm	Nos.	3	Gedore/Jhalani/Taparia or similar
1.3	Insulated flat plier 150mm	Nos.	3	Gedore/Jhalani/Taparia or similar
1.4	Insulated side cutting plier 200mm	Nos.	3	Gedore/Jhalani/Taparia or similar
1.5	Insulated combination plier 200mm	Nos.	3	Gedore/Jhalani/Taparia or similar
2	Screw Driver			
2.1	Screw Driver 150 * 3mm	Nos.	3	Gedore/Jhalani/Taparia or similar
2.2	Screw Driver 150 * 4mm	Nos.	3	Gedore/Jhalani/Taparia or similar
2.3	Screw Driver 150 * 5mm	Nos.	3	Gedore/Jhalani/Taparia or similar



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Annexure-B				
EI TOOLS (For CHHITAUNI, JATAHA AND MADHUBANI STATION BREAKUP				
SN	Description	Unit	Quantity	Make
2.4	Screw Driver 150 * 6mm	Nos.	3	Gedore/Jhalani/Taparia or similar
2.5	Screw Driver 150 * 8mm	Nos.	3	Gedore/Jhalani/Taparia or similar
2.6	Screw Driver 250 * 8mm	Nos.	3	Gedore/Jhalani/Taparia or similar
2.7	Screw Driver 250 * 10mm	Nos.	3	Gedore/Jhalani/Taparia or similar
3	Box spanner			
3.1	Box spanner 5mm	Nos.	3	Gedore/Jhalani/Taparia or similar
3.2	Box spanner 6mm	Nos.	3	Gedore/Jhalani/Taparia or similar
3.3	Box spanner 7mm	Nos.	3	Gedore/Jhalani/Taparia or similar
3.4	Box spanner 8mm	Nos.	3	Gedore/Jhalani/Taparia or similar
3.5	Box spanner 9mm	Nos.	3	Gedore/Jhalani/Taparia or similar
3.6	Box spanner 10mm	Nos.	3	Gedore/Jhalani/Taparia or similar
4	Adjustable screw wrench			
4.1	Adjustable screw wrench 6"	Nos.	3	Gedore/Jhalani/Taparia or similar
4.2	Adjustable screw wrench 8"	Nos.	3	Gedore/Jhalani/Taparia or similar
4.3	Adjustable screw wrench 10"	Nos.	3	Gedore/Jhalani/Taparia or similar
4.4	Hammer with handle 500gms	Nos.	3	Std. Make available
5	Cable knife 4"	Nos.	3	Std. Make available
6	Nylon Brush	Nos.	3	Std. Make available
7	Continuity Buzzer	Nos.	3	Std. Make available
8	Soldering Iron 220V, 50W	Nos.	3	Soldron or similar
9	Steel measuring tape 5M	Nos.	3	Freeman or similar
10	Solder wire 60/40, 18 Swg, 400gms	Rolls.	12	Bharti or similar
11	Screw driver set			
11.1	Screwdriver Bits square head 10pcs.Conforming to IS 12168 Part II 1987: 25mm and 50mm single head Type SBP 250, 251, 252, 253,	Set	3	Taparia or similar



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	500, 501, 502, 503 one No. each.			
11.2	Flat head screw driver bits conforming to IS 12168 Part I: 25mm SBF253,254,255,256,258,and50 mm503,504,505,506,508oneNo. each.	Set	3	Taparia or similar
11.3	Bit Driver 8.0x125mm BD 125	Nos.	3	Taparia or similar
12	Digital Multi-meter	Nos.	3	Fluke or similar
13	Miniature rechargeable hand held lantern with CFL/LED and incandescent bulb	Nos.	3	Eveready/Panasonic/ National or similar
14	Digital Earth Clamp Tester	Nos.	3	Motwane or similar

Annexure-C				
HASSDAC Tool Kit FOR CHHITAUNI JATAHA MADHUBANI				
SN	Description	Unit	Quantity	Remarks
1.1	Portable Data Analyzer (Downloading Event Logger Data for analysis and report generation)	Nos.	3	
1.2	Extender Card	Nos.	3	
1.3	Dummy Wheel	Nos.	3	
1.4	Ring Spanner	Nos.	3	
1.5	Open End Spanner	Nos.	3	
1.6	Socket Spanner with handle	Nos.	3	
1.7	Torque Wrench (Jaicom JPR 65 or equivalent 88NM)	Nos.	3	
1.8	Screw Driver no.902	Nos.	3	
1.9	Screw Driver no.935- 1 No	Nos.	3	
1.10	Dummy Load to check Power Supply(Resistive)	Nos.	3	
Marking Jig for drilling as applicable				

Annexure-D				
SN	Description	Unit	Quantity	Remarks
1.1	OFFICE ALMIRAH OF SIZE 900WX 1168.5Hx450 D MM AS PER MODEL	Nos.	3	



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Annexure-D				
SN	Description	Unit	Quantity	Remarks
	NO.KD MNOR WITH METAL TOP OF GODREJ MAKE OR SIMILAR			
1.2	CHAIR MODEL OXBO HIGH BACK (GO0DREJ OF SIMILAR).	Nos.	6	
1.3	TABLE MODEL OF SIZE 1370W X 740H X 690D MM AS PER MODEL NO.T-9 OF GODREJ MAKE OR SIMILAR.	Nos.	3	
1.4	CHAIR SUPERIOR QUALITY WITH ARM AND CANE SEATED OF SIZE 57D X 58W X 88H AND SEAT HEIGHT OF 45MM (GODREJ) MAKE AND MODEL NO. CLASSIC CH-7 OR SIMILAR .	Nos.	6	
1.5	OTDR WITH PRINTER HAVING DYNAMIC RANGE OF 35 DB AS PER TEC SPECIFICATION NO. TEC /GR/TX/OTD/01/04 APR. 2010 WITH LATEST AMENDMENT	Nos.	3	
1.6	DIGITAL EARTH TESTER WITH ACCESSORIES.	Nos.	3	
1.7	Spare of 2 MB PD MUX (Inspection-Consignee)			
	i. PSU Card	Nos.	6	
	ii. TME/NIM CARD	Nos.	6	
	iii. LPC/TRIB	Nos.	6	
	iv. E&M Card	Nos.	12	
	v. SUBS I/F Card	Nos.	6	
	vi. Exchange I/F Card	Nos.	6	
1.8	Digital Multimeter 4½ Digit Motwani / Rishabhmake.or similar.	Nos.	3	
1.9	OFC PATCH CORD WITH LC/PC-SC/PC 10 METER LONG.	Nos.	30	
2.0	cable/Pipe Route Locator as per Technical specification (Make & Model No. -3M Dynatelintergrated cable route tracer and marker locator 2273 M or similar / superior Inspection:-RITES	Nos.	3	
2.1	KRONE TOOLS MAKE -D-LINK OR SIMILAR.	Nos.	3	
2.2	fusion, splicing machine with accessories make Fuji kura model no. FSM50s or equivalent model of Fujitsu or siemens along with sufficient number of splicing	Nos.	3	



Annexure-D				
SN	Description	Unit	Quantity	Remarks
	protection slips and isopropyl alcohol to be supplied for test supplies.			
2.3	Optical power meter having resolution of 0.1 db and measuring range +3 dbm to -60 dbm as per TEC specification No. GR/OPM-01/03 FEB'05 with latest amendment & as per tech.	Nos.	6	
2.4	sealed battery Make:- Exide / Amaron. (12V/42AH)	Nos.	3	
2.5	RR Cell -6-1 (Primary Cell SITEL) for railway signalling and telecom application as per Specification No. IRS:S-95/96 Amd-1	Nos.	126	
2.6	Insulation Resistance Tester 500V DC, 100 Mega ohm, hand generator type, make Meco/Motwane/Waco or similar	Nos.	3	
2.7	Insulation Resistance Tester 100V DC, 100 Mega ohm, hand generator type, make Meco/Motwane/Waco or similar	Nos.	3	

3. Electrification of Railway Line

Electrification of railway line with 2x25kV traction System

The scope of work shall include but not be limited to design, drawing, supply as per approved standards/specifications of various structures/equipments/components (OHE, PSI, SCADA,AFL), construction, erection, installation of all structures/equipments/components(OHE,PSI,SCADA,AFL),auxiliary transformer station, LT power supply for CLS work, extension/augmentation of electrical power supply arrangements and associated works, establishing remote communication, insurance, obtaining necessary clearance/permits, testing, including integrated testing, commissioning, technical support, training, inventory, T&P, M&P, safety items at required locations, various types of caution, warning, instruction, protection, location/Name and schematic diagram boards at required locations, earthing stations, lighting arrangement,electrification of service buildings/roads,water supply arrangement, modification/shifting, dismantling, temporary provisioning of power supply to OHE, cross feeder, feeder, cross feeder to OHE, manning, EIG certification, CRS/PCEE authorization of section and other documentation for a complete system, supply of drawings, complete assistance till successful statutory inspection of the installations including handing over of all assets, supervision of maintenance (during Defect Liability Period) and all other works provisioned in EPC agreement necessary for commissioning of Railway Electrification Work of 2x25 kV AC OHE Traction System along with Sub-Sectioning Posts (SSP) with SCADA and Automatic Fault Locator over Paniahwa (Excl.) – Madhubani (Incl.) New Line Section of Varanasi Division, North Eastern Railway.

The contractor shall use MS Project/Primavera for project monitoring. The access of the same shall be provided to the Authority. For this the necessary



software tool along with user license shall be provided, the Contractor shall submit the following:

- Plan and schedule to submit the drawings and documents shall be submitted. Proper nomenclature shall be adopted for drawings and documents with the approval of Authority.
- The location wise names of the project teams members including their qualification and work experience.

3.1 Overhead Equipment (OHE)

3.2 The Scope of OHE work shall include but not be limited to Design, Supply, Erection, Testing & Commissioning of Overhead Equipment (OHE) as per 2x25kV AC OHE Traction System as per the RDSO Instruction No. – TI/IN/0042 or latest, including Foundations, Structures and all ancillary equipment as per following details along with PTFE neutral section, Protective screens on overline structure, Structure arrangement on bridge piers, feeder wire, earth conductors (aerial & buried), all types of caution, warning, instruction and protection boards at required locations, anti-theft charging arrangement, Traction Station Working Rule along with sectioning diagram at required locations (TPC, Traffic control, OHE Depot, AEE office), Safety items (i.e. key box, First aid box, shock treatment chart, Collar ring, men at work board) at required locations, construction of contractor's depot & sidings and all necessary documentation for EIG sanction and PCEE/ CRS Inspection, supply of drawings, complete assistance till successful statutory inspection of the installations including handing over of all assets, supervision of maintenance with breakdown attending (during Defect Liability Period) and all other works provisioned in EPC Agreement.

Provision of emergency arrangement of –

- Spare bridge mast on same or next pier of bridge as per site conditions and
- Spare Bracket assembly arrangement inside tunnel on same side 4.5 mtrs away from existing bracket assembly location wherever applicable.

3.2.1 Regulated conventional type OHE with normal contact wire height 5.80 Metre

The Scope of OHE works comprises of Paniahwa - Madhubani section as mentioned below -

S.N.	From Station to Station	km to km	Total Track km	Remarks
1	Paniahwa (excl.) - Chhitauni	0.350-3.6524	4.362	



S.N.	From Station to Station	km to km	Total Track km	Remarks
2	Chhitauni-Jataha	3.6524-17.300	15.924	
3	Jataha-Madhubani	17.300-29.449	14.523	

Design & Drawing of Overhead Equipment

For design & drawing, following to be followed strictly by contractor –

- IRSOD BG-2022 with all correction slips,
- ACTM 2022 with all correction slips,
- RDSO instructions no – TI/IN/0042 or latest for 2x25KV AT system and
- Latest RDSO OHE Employment schedule for Wind Zone – 155kgf/m² carrying the load of OHE with aluminum feeder wire & ACSR Racocon as AEC(Aerial Earth Conductor) with 1200 kgf tension in Contact Wire (107 mm²) and 1200 kgf tension in Catenary Wire (65 mm²).
- “Principles of preparation and checking of OHE layout plans and sectioning diagram” issued by RDSO

Contractor has to prepare –

- LOP - Layout Plan of OHE, CSD - Cross Section Diagram and SED – Structure Erection Drawing for OHE structures for –
 - Open sections,
 - Yards,
 - under overline structures (FOB, ROBs, OH transmission line),
 - over major bridges – provision of OHE structure with spare (with load calculation sheets for proposed arrangement),
 - Inside tunnel - OHE arrangement is to be designed by contractor showing all existing assets & proper clearance of OHE assets from live/ earth parts of tunnel with load calculation sheets for proposed OHE arrangement wherever applicable.
- Detailed designs for L.T. supply transformer stations as per latest standard RDSO Design & drawings and cable route drawings for LT power supply cable to CLS panel.
- GPSD, sectioning diagram and wiring diagram as per 2x25Kv AT system.



- Other designs and drawings including drawing of small parts steel work (other than those for which RDSO standard drawings are available) & submit for approval.
- Long section drawings of overhead including detailed study of over line structures such as foot over bridges, road over bridges. for maintaining the specified height of contact wire and requisite clearances also included in this item.
- Bonding plans of yards.

Contractor has to carry out soil testing to determine type & allowable bearing pressure of soil at suitable intervals (generally at every 5 km) or any other requirement to determine type of foundation to be followed for that particular section and complete the above schedule item and submit reports to Authority.

All electrical (TRD) related drawings shall be prepared by the contractor.

Contractor shall retrace the existing drawings on new drawings.

In-Principle Drawings - Contractor has to prepare above mentioned /or all relevant in-principle drawings for the proposed section and submit 02 nos. check paper prints for verification from railway. Contractor needs to make suitable corrections/modifications raised on check prints from railway, and submit 01 no. color print on tracing of GPSD, sectioning diagram and 01 no. black/white print on tracing of wiring diagram, LOP, SED, CSD, Bonding plan of yards, LT cable route drawings, tunnel OHE arrangement, Bridge mast arrangement, OHE profile drawings for approval. After approval of in-principal drawing of proposed work, contractor has to submit 06 nos. paper prints of approved copy of in-principal drawings to the railway.

As-Erected Drawings - After completion of all works at site, contractor has to prepare As Erected drawing of GPSD, Sectioning diagram, wiring diagram, LOP, SED, CSD, bonding plans of yards, LT cable route drawings, tunnel OHE arrangement, Bridge mast arrangement, OHE profile drawings of the proposed section and submit 01 no. check paper prints for verification from railway. After incorporation of remarks on check print, contractor have to submit 01 no. color print on tracing of GPSD, sectioning diagram and 01no. black/white print on tracing of wiring diagram, LOP, SED, CSD, Bonding plan of yards, LT cable route drawings, tunnel OHE arrangement, Bridge mast arrangement, OHE profile drawings for approval. After approval, contractor have to provide 06 set of paper prints of approved drawing with 01 set original tracing, 01 no. RTF or film reproduction, 01 no. scan copy and 01 no. Auto CAD file to Railway for each drawing.

Foundations of OHE Structures

- Foundation to be casted as per the approved LOP, CSD and follow standard latest RDSO drawing for particular FBM Codes
- The volume of the foundation shall be as per approved in-principle CSD parameters of foundation (which is based on latest RDSO drawing/spec).



- If any special foundation is required due to site conditions, prior approval of design & drawing of special foundation (submitted by contractor) to be taken from competent authority i.e. Construction office or NER Head Quarter Office or RDSO.
- Concrete for foundations of OHE structures should be of Grade M-10 (Ratio of Cement, sand, gravel – 1:3:6) and of Grade M-15 (Ratio of Cement, sand, gravel – 1:2:4) as per IS 456:2000 and IS 10262:2009 or latest. Foundation casting shall be done in compliance of IS: 456:2000 or latest in each & every respect particularly material quantity, mixing, casting curing, frame work. Material used i.e. cement, aggregate and water shall be confirming to IS 458 or relevant latest IS.
- Muffs for all structures to be provided as per latest standard RDSO guidelines.
- Curing of foundation shall be done by contractor for 28 days or as desired by representative of railway according to site condition.
- Contractor has to prepare standard cube of size 150x150x150mm as a sample for every 50 cum of foundation cast & is to be tested as per IS-516/1959 (or Latest) to obtain the result as per IS 456/2000 (or latest). The sample of the concrete from which test specimens are made shall be representative of entire batch. All the test on the test cubes shall be carried out from approved laboratory/ institutes and cost of test shall be borne by the contractor. Cube test report must be submitted to concern SSE/JE(Const./NER).
- Cement used shall confirm to IS: 12269-1987 or latest & grade 43 (OPC).
- The brand/make of the cement to be used for concrete activity should be as per letter no-W/CON/98/New material/W-1/Loose-1,Dated-01.01.2026.
- Digging, earth excavation for foundation casting should be carried out very cautiously avoiding damages to Electrical /Telecommunication /Signalling cable passing nearby or under the site of excavation. If any Electrical/ Telecommunication/Signalling cable gets damaged during foundation work, then as per HQ/RB guidelines penalty amount of the same shall be borne by contractor.
- Provision shall be made for embodiment of drain pipes, conduits for cable or earthing flats where necessary.
- Provision for smooth plasters on exposed foundation and muff.
- It includes work of excavation and all re-inforced concrete work for foundation including supply of cement and other material including bending, binding laying the reinforcement, shoring wherever necessary for casting concrete including frame work wherever necessary, grouting and finishing the tops of foundation blocks.



- Nominal reinforcement in structure foundations wherever required will be provided for which no extra payment shall be made

OHE Structures (Mast, TTC, Portal, AT masts, Feeder masts, super masts assemblies, bridge masts, DA, SPS) –

- It includes rolled or fabricated, galvanized traction mast, TTC, Portal, AT masts, feeder mast, super-mast assembly, bridge masts, DA, SPS, steel gantries as per the approved LOP, CSD.
- All gantries / portals / mast and supporting steel structures and small parts steel work will be supplied by the Contractor. The term "Small parts steel work" is meant to cover fabricated steel work made from rolled steel sections such as cross beams, base-plates, backing angles, knee brackets. Including bolts, nuts, locknuts and washers. for fastening the small parts steel work to any structural member.
- Galvanization thickness shall be as per latest RDSO specifications No. ETI/OHE/13(4/84) with C.S. 4/90 or latest.
- In case, required size of channels are not available as per approved drawing, higher size of channels can be used with approval of Dy.CEE/C and payment as per actual black weight will be paid.
- Special design DA for anchoring purpose (ACA, BWA) inside tunnel & bridge mast channels are to be submitted for approval with load calculation sheets.
- For standard fabrication of steel work or structures for which RDSO/CORE approved drawing are available, the black steel weight of steel work as specified in RDSO/CORE drawing, shall be considered.
- Galvanization damaged during transportation/ carting the rectification shall be done as per clause 8 of RDSO specification No. ETI/OHE/13 (4/08) with A&C 1 to 4 (using Zinc based solidifier/ zinc based painted.)
- It includes provision of OHE structure over major bridges with spare arrangements (to cater emergency), for spare arrangements base plate with all channels & complete accessories to be provided on site & spare OHE structure (Mast or other) to be provided in depot. Scope of spare OHE bridge structure is included in tender and it is other than OHE spares provided under inventory to the depot.
- It includes provision of OHE structure (as per design) inside tunnel with spare arrangements (to cater emergency), for spare arrangements base plate with all channels & complete accessories to be provided on site & spare OHE structure (as per design) to be provided in depot. Scope of spare OHE structure is included in tender and it is other than OHE spares provided under inventory to the depot.



- It includes super-mast assembly complete in all respect for successful erection and stringing of aluminum ‘SPIDER’ feeder wire:
 - Feeder cross arm- 02 nos. at each location (RI No. 8015/8012).
 - Suspension support angle- 01 no at each location (RI No. 8014 or 8014-1).
 - 18mm single clevis- 01 no at each location (RI No. 5040).
 - Large suspension clamp- 01 no at each location (RI No. 1580).
 - Batten plate- 01 no at each location (RI No. 8016).
 - Snap head pin with washer & split pins- 01 set at each location (RI No. 262).
 - M-16 bolts 50/38 with nuts and lock-nuts- 12 nos. at each location (RI No. 16/3NL).
 - Any other leftover material/fitting required for successful stringing & erection of feeder wire shall have to be supplied by the contractor for which no extra payment shall be made.

Dropper Schedule: –

Dropper schedule for 1200/1200 kgf tension with 0.8mm/m pre-sag in OHE issued vide RDSO letter No.TI/OHE/GA/2018 dated 20.09.2018. Dropper Schedule for 0.9/0.9m Encumbrance is as per RDSO drg. No.TI/DRG/OHE/DROP/RDSO/00001/20/0. For 72m span presag will be 58mm (0.8X72). Dropper Assembly should be provided as per Drg. No. ETI/OHE/P/1190 Rev. B.

Contact wire Gradient: –

Reduction of Contact wire Gradient to be done from 3mm/m to 2mm/m & Relative gradient from 1.5mm/m to 1mm/m.

Adjustment at turnouts:

Following to be applied during adjustment at turnouts-

- At obligatory mast vertical gap between main line and turn out contact wire is to be maintained between 50 to 60mm.
- At 5m distance from obligatory mast, gap is to be maintained at 50 mm.
- At 10m distance from obligatory mast, gap is to be maintained between 40mm to 50mm.
- Track separation is to be kept between 290mm to 550mm.



- Span length of turnout location reduced during increasing track separation.
- From main line to loop line “take off” may be maintained in between 720 to 750mm.

Drop Bracket Assembly & Steady Arm:

Drop Bracket Assembly as per Drawing No. ETI/OHE/P/2360 shall be provided along with steady arm as per drawing no. ETI/OHE/P/2390.

Current Carrying ‘A’ Dropper:

Current carrying ‘A’ dropper as per Specification No. TI/SPC/OHE/CCFD/0160(02/2020) or one C jumper (in span jumper) in every span should be provided. The Drawing Nos. TI/DRG/OHE/CCD/RDSO/00001 to 4/20/0 for current carrying dropper assembly, Catenary wire clamp, Contact wire Clamp, Compression sleeve, thimble & cable lug for current carrying droppers.

Droppers:

Rigid droppers shall not be provided, only loop type droppers should be provided.

Double Pole Isolator:

Double pole Isolator type II should be provided at Insulated Overlap of 1250 Amp rating as per Specification No. TI/SPC/PSI/ ISOLTR/0210(06/21) or latest. Mounting Arrangement should be as per Drawing No. ETI/OHE/G/06005 Sh-2 & ETI/OHE/G/06008 for mast and portals respectively.

Cross-type OHE shall not be provided, instead overlap type OHE to be provided.

G Jumpers:

160 mm² G Jumper as per specification no. ETI/OHE/3(2/94) to be provided.

Structure Number Plate:

Retro reflective structure number plate shall be provided for all OHE structures as per RDSO Drawing No - ETI/OHE/P/7503 Rev-E or latest and as per Railway Board letter No. 2001/Elect (G)/170/1 Pt dated 07.05.2012. Retro Reflective number plate may be provided at additional masts if required, by Zonal Railway, as per Rly Board’s letter No. 2001/Elect (G)/170/1 Pt dated 18.10.2012.

Contact Wire:

Hard Drawn Grooved Copper Contact Wire, Jointless, 107 Sqmm made out of Continuous Cast Copper Wire Rods as per RDSO Spec. No TI/SPC/OHE/CW/0971 Or Latest.

Catenary Wire:



A stranded cadmium copper wire of Cross-section area 65mm² having no. of strands is 19. The Diameter of each strand is 2.10mm. and the overall diameter of catenary wire is 10.50 mm as per RDSO spec. No - TI/SPC/OHE/CAT(cu-cd)/0971. or latest.

Earthing & Bonding:

AEC (Aerial Earth Conductor) & BEC (Buried Earth Conductor) shall be provided to contain the touch & step potential of the track. AEC of 12.24 mm dia. ACSR Raccoon conductor should be erected on the back side of the OHE masts/Portals. Similarly BEC of 20 mm dia. (cross section 238.64 mm²), galvanized steel conductor should be laid underground along the UP and DN track separately, 300mm below ground surface and approximately one meter away (or as per site conditions) from the OHE foundation towards opposite direction of track. The BEC will be connected to each OHE mast/Portal and Feeder mast by same conductor having Tee Connector & Lug Connector as per Drawing No. TI/DRG/OHE/TC/RDSO/00001/20/0 & TI/DRG/OHE/SC /RDSO/00001/20/0 for BEC end and Lug for connection with mast/portal. The cross bonding of the UP BEC–UP Mast/Portal–UP Traction Rail–DN Traction Rail–DN mast/Portal–DN BEC should be done by 50X6 mm MS/GS flat at every 450 mtr. The details of the AEC/BEC and cross bonding scheme are given in drawing no TI/DRG/OHE/EARTHING/RDSO/00001/20/0.

At stations, BEC conductor should be laid underground for Loop lines & platform also. BEC can be run on the side wall of Platform (platform coping) with suitable clamp & bolt grouted in the coping. BEC should be connected to Earth Pit as per Drawing No. ETI/OHE/P/7020 Rev. B at every 450m wherever it is exposed above the ground. At Bridges/Platform coping laying arrangement of BEC should be as given in Annexure-45 of RDSO Instruction No. – TI/IN/0042.

For Three line and four line section separate BEC should be provided for each line.

The above recommendation are as per prevalent practice used in 2X25 KV system with 12 KA fault current adopted by other projects in country. However, the adequacy and efficiency of this earthing and bonding system should be verified by the simulation studies/measurements of the touch and step potential of the rail in normal load and short circuit condition for compliance with EN 50122-1 and IEC 62128-1 (2013).

Drawings –

To be followed as mentioned under para 1.5 of RDSO Instruction no. – TI/IN/0042 or latest RDSO approved drawings for 2x25kV traction system.

Preparation & submission of traction SWR diagram & station operation/working rules as per approved sectioning diagram and ACTM guidelines in form Appendix – G in bi-lingual language- English & Hindi.

The diagram shall be prepared in AUTOCAD and submitted for approval along with traction station working rules.

After approval, supply of 12 nos. hard copy set of traction station working rules and



drawing (color Paper print) & switching operation rules, one editable soft copy of TSWR, 01 Auto CAD file of TSWR Diagram and original tracing copy of TSWR Diagram shall be submitted to railway.

Fabrication, supply and erection of traction SWR board diagram based on approved sectioning diagram -

The board shall be of appropriate size as desired by the railway.

The board shall be framed in polished/painted teak wood/metal frames. Frame shall have suitable hinges to be fixed on wall or glass frames in front of station master/section controller/traction power controller in his room/board, OHE-PSI Depot, TSSs, SP, SSPs.

The direction of diagram fixed shall match with actual direction of traffic in front of station master.

This diagram shall be stamped on transparent vinyl film from computer and pasted on FRP sheet (5/6 mm thickness or as desires). The font size of letter & other details shall be readable from normal distance.

Non- standard size of boards may be required due to following reasons: -

In large yards/stations it may not be possible to accommodate all the features in standard size of boards 6x4 sq. feet.

In small stations/Junction Cabins, TPC cubicles, Section controller rooms, OHE PSI Depot, TSSs, SP, SSPs, it may not be possible to accommodate all features in standard size of boards 6x4 sq. feet.

Supply with mounting arrangement of wooden key box with glass front in frame, with hinges and locking arrangements 18 x 24 x 6 inch. The box has sufficient numbers of hooks for keys at SM office of station.

Provision of safety items like insulation gloves (Class 4 hand gloves with 36kV working voltage as per IEC 60903:2014), First Aid kit, 2 mtr long wooden bamboo stick in SM office.

Provision Shock treatment chart in SM Office, Relay room. as advised by Authority Engineer.

Public & Staff Caution Boards at PF area, waiting hall, SM office area as advised by Authority Engineer.

Guy rod assembly of various lengths for traction masts/portal upright/gantries complete with mast guy rod fittings, guy rod with adjustments and parts to be grouted in the anchor block including small parts steel and dwarf mast anchor.

All components should be as per latest Specification with Revision (if any).

Railway ID No.	Description of components	Qty/Unit
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EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Railway ID No.	Description of components	Qty/Unit
3241	Mast anchor fitting for cliff type of structure	1 No.
3242/ 3232	Mast guy rod fitting with 4 sets of bolts of 20 mm dia of suitable length with nuts, locknuts, washers for attachments to mast/ SPS including appropriate fitting	1 No.
5001/ 5001-1/ 5001-3	Stud bolts for dwarf mast (850mm), anchor bolts (complete with nuts, locknut & split pin)	2 Nos.
-	Triangular attachment for dwarf mast.	1 No.
5002	Guy rod stirrup	1 Set
5004 or 5005 or 5005-2 or 5006-2 or 5070-1 or 9070 or 9071 or latest	Guy rod with nut, washer, split pin	1 Set
5007-1	Anchor V bolt	1 Set
5008	Anchor loop	1 Set
5220-2	Guy rod double strap assembly	As required

Single bracket cantilever assembly complete with insulator for conventional & inside the tunnel, as per RDSO instruction No – TI/IN/0042 or latest.

Bracket assembly on a traction mast or Support on drop arm or on base plate inside tunnel and shall include those on high/low level platform in the vicinity of turnouts over bridges or overlaps and at all locations with reduced encumbrance/terminating wires as per latest RDSO drawing for conventional OHE.

Bracket assembly complete in all respect with all components including galvanized steel tubes, backing angles for bracket assembly, insulators, top fitting, bottom fitting, nut bolts and any other items/fixture required to erect the bracket assembly complete in all respect as per all sites, if any.

All components including registered arm dropper excluding small parts steel work if any.

Composite insulators shall be used in polluted Zone and stone pelting areas with prior approval of Dy.CEE/C.

It includes provision of OHE brackets with base plates of top-bottom fittings inside tunnel with spare arrangements (to cater emergency), for spare arrangements base plate with all fasteners & complete accessories to be provided on site & spare OHE brackets to be provided in depot. Scope of spare OHE brackets is included in tender and it is other than OHE spares provided under inventory to the depot.

Testing of insulator (ST/BT/9T/SI) with Hydraulic insulator testing machine. Calibrated Insulator testing machine shall be arranged by contractor.

All Components shall have complied latest RDSO/CORE specification in all respects.

Fabrication of cantilever assembly parts/components as per arrangement given in



RDSO drawing ETI/OHE/G/02106 Sh. 01 to 03 or latest.

(Note: Forge type fittings shall be used instead of MCI wherever applicable)

Regulated equipment (3 pulley type) with counter weight assembly for 2400 kgf tension as per RDSO Spec TI/SPC/OHE/3PHATD/0150 with ACS -A or latest.

Counter weight assembly including 9 Ton adjuster & 9T Insulator with double strap assembly, and normal/anti theft guide tube assembly including supply of regulating equipment as per RDSO specification no. TI/SPC/OHE/3PHTAD/0150 with ACS 1 or latest for 2400 kgf tension and stainless-steel wire rope (conventional OHE) suitable for 3 Pulley ATD 2400 kgf tension required for regulating equipment and small parts steel work, if any.

It include anti-falling device, anti-climbing (stiffener) Angle on Anchoring and double eye distance rod.

Compliance of latest technical circular, MI/SMI's, Reliability action plan (if applicable). Use of insulator for high-speed OHE shall be as per design document no. TI/DESIGNDOCUMENT/OHE/2020/00-Rev.1 or latest.

All material necessary for the termination of double (two nos.) conductor (catenary, contact wires) of overhead equipment terminating wire on a traction mast, portal or structure including clevis assembly, adjuster, anchor double strap, ending clamp for catenary or contact or terminating wire with fitting and 9T composite or porcelain insulator assembly (as desired by railway) but excluding terminating wire if any,

It includes the all fasteners required for termination.

All material necessary for the termination of single (one no.) conductor (large span wire, feeder wire, AEC conductor) of overhead equipment terminating wire on a traction mast, portal or structure including clevis assembly, adjuster, anchor double strap, ending clamp for catenary or contact or terminating wire with fitting and 9T composite or porcelain insulator assembly (as desired by railway) but excluding terminating wire if any, It includes the all fasteners required for termination.

12.24 mm dia ACSR Raccoon conductor (used as Air Earth Conductor-AEC) with complete mast fitting as per RDSO Drg. No. TI/DRG/OHE/ERBOND/RDSO/00001/11/0 or latest, TI/DRG/OHE/FEEDER/RDSO/00002/19/0 or latest & as per RDSO specification TI/IN/042 or latest.

Connecting the ACSR on back side of OHE/feeder mast.

ACSR conductor jointing, Anchoring/ termination arrangement as per drawing no. TI/DRG/OHE/AECMAST/RDSO/00001/21/0 or latest and wherever required in one TKM as per site conditions. 20mm dia. (cross section 238.64 sqmm) galvanized steel conductor (used as Buried Earth Conductor- BEC) as per RDSO drg. & specification TI/IN/042 or latest.

Laying of BEC in 300 mm deep trench (underground) dug.



Provision of digging of trench 300mm deep in block section or yard along the track for laying of BEC as per drawing no. TI/DRG/OHE/SK/TRENCH/00003/22/0 and RDSO instructions No – TI IN 0042 or latest with refilling in all type of soil.

Repair of PF area if any due to digging.

Tee Connector & Lug Connector required as per Drawing No. TI/DRG/OHE/TC/RDSO/ 00001/20/0 & TI/DRG/OHE/SC /RDSO/00001/20/0 or latest for BEC end and Lug for connection with mast/portal.

Clamp and bolt for suitable grouting of BEC on PF coping in yard area and on bridges. Earth electrode & earth chamber with MS/GS Flat 50x6 mm.

40 mm x6 mm mild steel flat structure bond – based on RDSO's/CORE's/IS/BS specification No. ETI/OHE/71(11/90) with latest A&C slip and as per drawing no. ETI/OHE/P/7000 Rev. F or latest for bonding metallic structures in yards to nearest traction rail.

All materials including mild steel flat of minimum size 40mm x6mm required to provide a structure bond as specified by Purchaser connecting a traction mast or steel structures to the nearest non-track circuited rail, or earth electrode, including all fastenings at both ends.

Two coats each of red-oxide and black paint on the bond and erection of all materials including the bond.

Galvanized steel flats should be Hot dip galvanized as per specification no. ETI/OHE/13 (4/84) with A&C-4.

Average mass of zinc coating should be as suitable for marine & chemically polluted areas.

Shaping and drilling of the bond and Rails & chamfering of rail holes and erection of all materials including the bond. Drilling work in Rail must be done in the presence of authorized railway representative to avoid any Rail damage incidence.

Cutting of slit at platform and repairing of platform after erection of bond as per RDSO specification. The price shall also cover cleating of structure bond if laid in the platform area.

Provision of heat shrinkable PVC tube for structure bond under track circuit rail.

40 mm x6 mm mild steel flat longitudinal bond – based on RDSO's/CORE's/IS/ BS specification No. ETI/OHE/71(11/90) with latest A&C slip and as per drawing no. ETI/OHE/P/7030 Rev. F or latest.

All materials including mild steel flat of minimum size 40mm x6mm including fasteners at both end to provide longitudinal bonds connecting rails of the same/adjacent tracks at the locations to be specified by the Purchaser.

Two coats each of red-oxide and black paint on the bond and erection of all



materials including the bond.

Galvanized steel flats should be Hot dip galvanized as per specification no. ETI/OHE/13 (4/84) with A&C-4.

Average mass of zinc coating should be as suitable for marine & chemically polluted areas.

Shaping and drilling of the bond and Rails & chamfering of rail holes and erection of all materials including the bond. Drilling work in Rail must be done in the presence of authorized railway representative to avoid any Rail damage incidence.

Provision of heat shrinkable PVC tube for structure bond under track circuit rail.

40 mm x6 mm mild steel flat transverse & special bond – based on RDSO's/CORE's/IS/ BS specification No. ETI/OHE/71(11/90) with latest A&C slip –

All materials including mild steel flat of minimum size 40mm x6mm including fasteners at both end to provide longitudinal bonds connecting rails of the same/adjacent tracks at the locations to be specified by the Purchaser.

Two coats each of red-oxide and black paint on the bond and erection of all materials including the bond.

Galvanized steel flats should be Hot dip galvanized as per specification no. ETI/OHE/13 (4/84) with A&C-4.

Average mass of zinc coating should be as suitable for marine & chemically polluted areas.

Shaping and drilling of the bond and Rails & chamfering of rail holes and erection of all materials including the bond. Drilling work in Rail must be done in the presence of authorized railway representative to avoid any Rail damage incidence.

Provision of heat shrinkable PVC tube for structure bond under track circuit rail.

Earth electrode assembly as per IS: 3043 and latest RDSO drawings No- ETI/PSI/222-1, ETI/PSI/201-1 and ETI/OHE/P/7020 with latest revision for OHE & PSI and Specification no – TI/SPC/PSI/ERTHNG/0210 or latest for block section, yard, SP/SSP/TSS earth system, suitable for 2x25kV traction system.

Earth electrode of suitable length as per OHE & PSI (SP/SSP/TSS).

All materials, fasteners, nut bolts, required for earthing arrangement.

Protective concrete box with removable cover as provided in RDSO drawing and specification.

Manual excavation of earth for providing earth station, cost for wooden charcoal, salt to found earth resistance within limits and erection of protective concrete box



and RCC cover.

In case of platform, the digging the PF surface level and erect electrode below ground level and provision of earth chamber cover with handle submerged in the PF floor level.

Testing and commissioning of an earth electrode confirming to IS 3043, IS 1239 or RDSO Specification with latest amendment.

Stenciling the earth resistance measurement details (Earth pit number, earth resistance value) on earth pit cover box with yellow and black paint or as desired by concern SSE/JE (Const.).

50x6 mm galvanized mild steel flat as per railway standards for cross bonding between BEC, mast & traction rail for 2x25kv traction system.

Galvanization shall be done as per RDSO spec No. – ETI/OHE/13(4/08) with A&C 1 to 4 ensuring quality of Zinc, base metal, surface preparation. If galvanization is damaged due to cold drilling, welding, cutting, handling, erection the rectification shall be done as per clause 8 of RDSO specification No. ETI/OHE/13(4/08) with A&C 1 to 4 (using Zinc based solidifier/ zinc based painted).

Two coats each of red-oxide and black paint on the flats and erection of all materials including the bond.

Galvanized steel flats should be Hot dip galvanized as per specification no. ETI/OHE/13 (4/84) with A&C -4. Average mass of zinc coating should be as suitable for marine & chemically polluted areas.

Shaping and drilling of the flats and Rails & chamfering of rail holes and erection of all materials including the flat. Drilling work in Rail must be done in the presence of authorized railway representative to avoid any Rail damage incidence.

Cutting of slit at platform and repairing of platform after erection of flat as per RDSO specification.

Provision of heat shrinkable PVC tube for structure bond under track circuit rail.

The cross bonding of BEC – Mast/Portal- new traction Rail should be done by 50X6 mm MS/GS flat at every 450 mtr. The details of BEC and cross bonding scheme are given in drawing no. TI/DRG/OHE/EARTHING/RDSO/00001/20/0.

At stations, BEC conductor should be laid underground for Loop lines & platform also. BEC can be run on the side wall of Platform (platform coping) with suitable clamp & bolt grouted in the coping. BEC should be connected to Earth Pit as per Drawing No. ETI/OHE/P/7020 Rev. B at every 450m wherever it is exposed above the ground.

Cross bonding at station area to be provided with 50x6 mm MS/GS Flat with PVC sleeves under track circuit rail and connecting BEC – mast/Portal – non-traction rail of main line and loop lines. For Open Section - The prices shall cover the erection of



earth flat either buried at the suitable depth below ground level painted with two coats of red oxide zinc chromate primer and two finishing coats of bitumen or fixed on wooden gutties on wall. It shall include connecting the earth bus to earth electrodes and to various floor on walls mounted equipment's or structures to be earthed and also connections to non-track circuited rails where ever required.

All components in accordance to RDSO instruction No – TI/IN/0042 or latest, i.e., different type of PG clamps, 5mm Dropper wire, contact and catenary wire dropper clip, catenary and contact wire ending clamp, catenary and contact wire splices, double straps, Retro- reflective Number plate & various type of caution/warning & other boards, shock treatment chart, Anti-creep wire with anchor including 9T insulator and fittings, Material required for providing contact wire in place of catenary wire under FOB, ROB and over line structure (As per latest guide lines) with SPS for attachment on mast / structure, Jumper wires of suitable size with PG clamps for 'G, jumper, potential equalizing jumper, anti-theft jumper, X feeder drop jumper, Isolator Jumpers and any other jumpers (where their use is approved).

Different types Parallel grooved clamps 5 mm Copper Droppers with 01 no. C - jumper for each span as per latest guidelines.

Contact and catenary clips assembly.

Contact and Catenary ending clamp assembly.

Catenary & Contact Splice.

Retro-reflective Number Plates with SPS and fastener,

Caution/warning/danger boards, Power block working limit boards, Engine stop board, Unwired OHE/

Turn out, 250M, 500M, DJ close, DJ open and other indication boards must for commissioning for OHE.

Conforming to latest RDSO specification & drawing.

Different type of Copper Jumpers i.e., C, F, 160 sqmm 'G', Potential equalizing, Anti-theft, cross-feeder

Drop, Isolator Jumpers of size 160 sqmm.

Any extra fittings required for Turn-out, cross-over, Diamond crossing

Anchor Double straps, Cut-in-insulators (9T) assembly for IOL's, compensating plate/equalizing plate Anti-creep complete assembly with Galvanized steel wire (If required, anti-creep copper wire will be supplied by railway)

Note: All items included in above item should conform to latest RDSO/CORE Specifications.

Providing anti-creep anchor, contact wire in place of catenary under ROB, FOB and



over line structures.

Erection of any extra fitting required for turnout, cross over, diamond crossing.

Erection of all components fitting required for erection of contact and catenary wire including contact and catenary splices, catenary wire ending clamp, contact wire ending clamp, anchor double strap, compensating plate/equalizing plate.

Erection of Cut-in (9T) insulator with catenary/contact wire ending clamp for catenary & contact wire for all insulated overlaps.

Erection of Catenary/Contact wire splices and other materials required for modification in existing OHE/New OHE where contractor claims erection of OHE cost.

Erection of complete anti-creep assembly including termination assembly, anticreep wire and other SPS's.

Erection of complete assembly of 130 sqmm large span wire with ending cone and termination Hard Drawn Grooved Copper Contact Wire, Jointless, 107 Sqmm made out of Continuous Cast Copper Wire Rods. as per RDSO Spec. No TI/SPC/OHE/CW/0971 Or Latest Un-insulated 25 KV AC Copper Cadmium Catenary wire (19/2.10MM) 65 SQ. MM confirming to RDSO specification no. TI/SPC/OHE/CAT (Cu-Cd)/0971 or latest.

Large span cadmium copper wire of dia. 2.10 mm / 37 strands cross section size 130 sqmm (as per RDSO/CORE specification).

25 KV feeder conductors (along or across tracks) made of all hard-drawn aluminum 'SPIDER' Conductor conforming to IS-398 (Pt.I) with latest amendment and of dia. 3.99 mm /19 strands having cross-section area of approx. 234 sqmm as per relevant RDSO specification (latest).

Complete assembly of short neutral section (PTFE) (Phase breaker).

End fitting for contact & catenary wire and other material required for erection & smooth operation with earthing arrangement.

Earth electrode to be connected as per relevant OEM specification & RDSO guidelines.

The short neutral assembly to be as per RDSO specification No. TI/SPC/OHE /SNS/ 0000 Rev-1 with A&C Slip No.1 or latest. Neutral section should be purchased from RDSO/CORE approved source only.

The material to be suitable for 2x25kV traction system i.e. 65 sq.mm Catenary, 107 sq.mm contact wires & feeder wire 234 sq.mm.

Erection, connection to earth electrode via flexible electric cable on the mast & up to the earth electrode via MS/GS/Flat 50x6 mm to be done.



Light weight section insulator complete assembly as per RDSO specification TI/SPC/OHE/LWTSI/0060 rev 1 with A & C slip 1 or latest.

25 KV, 1600A Single pole isolator complete (as per RDSO specification No. TI/SPC/PSI/ISOLTR/0210 02/21 or latest), with mounting base (including 25 KV pedestal insulators-2 Nos. and operating rod insulators- 1 Nos.), operating rod and operating rod guides and all accessories required for its smooth and trouble free operation of the isolator for goods siding.

Al/Cu strips, a 50 mm Brass pad-lock (Make - Godrej, Link or equivalent), integral lock, flexible copper strip/jumper for shunt earthing and an Enameled number plate of approved design for each isolator. 02 no. terminal connector.

Out-trigger complete assembly (if applicable). 18mm copper bus bar with 04 nos. bus terminals/ connectors & splices required for use with SPI in OHE. Earth contact assembly with necessary fittings for an isolator as per RDSO/CORE specifications.

3x25 mm copper connections between the earth contact assembly and isolator portion in order to earth OHE of onward section.

Mast is to be provided with earth electrode with chamber as per ETI/OHE/P/7020 with latest rev.

Pre-commissioning tests of the SPI as prescribed in the OEM Manual or as per Railway Guidelines. The contractor should arrange the necessary tools and plants for the test at their own cost. Additionally, the contractor must submit the necessary documents for tools and measuring instruments, such as a calibration certificate, before conducting the test.

25 KV, Double pole Isolator type II should be provided at Insulated Overlap of 1250 Amp rating as per Specification No. TI/SPC/PSI/ISOLTR/0210 02/21 or latest.

Mounting Arrangement should be as per Drawing No. ETI/OHE/G/06005 Sh-2 & ETI/OHE/G/06008 for mast and portals respectively.

Mounting base (including 25 KV pedestal insulators-4 Nos. and operating rod insulators-2 Nos.), operating rod and operating rod guides required for the operation of the isolator.

Al/Cu strips, a 50 mm Brass pad-lock (Make - Godrej, Link or equivalent), flexible copper strip/ jumper for shunt earthing and an Enameled number plate of approved design for each isolator.

Out-trigger complete assembly (if applicable).

18mm copper bus bar with 04 nos. bus terminals/ connectors & splices required for use with DPI in OHE.

Pre-commissioning tests of the SPI as prescribed in the OEM Manual or as per Railway Guidelines. The contractor should arrange the necessary tools and plants for the test at their own cost. Additionally, the contractor must submit the necessary



documents for tools and measuring instruments, such as a calibration certificate, before conducting the test Complete 25 KV solid core long creep-age Porcelain cut-in-insulator assembly including double strap, Catenary wire or contact wire ending cone. saddles as per RDSO specification No. - TI/SPC/OHE/INS/0070 (04/2007) with A & C slip no. 1 & 2 or latest.

Complete 25 KV solid core long creep-age Porcelain suspension insulator assembly including Double strap, single eye clevis, suspension clamp. saddles as per RDSO specification No. - TI/SPC/OHE/INS/ 0070 (04/2007) with A & C slip no. 1 & 2 or latest.

Complete of 25KV Post Insulator with fasteners and saddles as per RDSO specification No. - TI/SPC/OHE/INS/ 0070 (04/2007) with A & C slip no. 1 & 2 or latest.

Provision for hiring of 6/5 kVA, 220V, Single phase DG sets with operator and maintenance for 2.2 KV Anti theft charging of OHE on hiring basis.

Running cost of D.G. set with supply of fuel and other consumable as per scope of work, 10 Hrs per night.

6/5 kVA, 220 V single phase, DG set with including starter, distribution board containing MCB, Ammeter, Voltmeter, Buzzer, 3 nos. color light bulb & Kit Kat Fuse with operator and maintenance.

The DG sets shall be employed progressively at different locations in the section as per the Railway requirement.

The time period from 19:00 hrs to 05:00 hrs for OHE charging is indicative and may change depending on the sunrise and sunset and site requirement. However, instruction for switching on and switching off the anti theft charging of the OHE may be communicated every day to the DG operator by authorized Railway personnel and the charging should be done accordingly.

Auxiliary Transformer of rating 220V/2200 V shall be employed with all the fittings and accessories required for installation of cable/jumper will be provided by contractor.

A register is to be maintained to record the actual running time of the DG set which is required to be duly certified by Railway personnel authorized for the purpose. The proforma for the log shall be provided to the contractor and the entry in register be made accordingly.

All men and materials required for installation, operation & maintenance of D.G. sets will be provided by the contractor. D.G. Sets will be operated by Contractor's operator. The operator shall remain present at site for all the time for which the anti-theft charging of OHE is done be it from DG set supply or local electricity supply. Any electric supply required at site for whatsoever purpose shall be arranged by the Contractor/s. The contractor/s shall be responsible for the arrangements for obtaining electric supply at his/their own cost.



The contractor shall ensure availability of DG set for anti theft charging at all times through proper maintenance and availability of spare DG sets.

The personnel employed by the contractor at site shall be provided with a mobile by the contractor and be approachable at all times on the mobile. On receipt of alarm or any fault in the system, the personnel employed by the contractor at site shall immediately inform the Railway personnel whose contact number will be informed to the contractor. The cost and expenses for the mobile provided to the personnel employed by the contractor shall be borne by the contractor.

The contractor shall submit a self-certified photograph along with address, proof of identity and mobile number of the personnel employed by the contractor. The contractor shall also issue identity cards to these personnel.

Dy. CEE/C or his representative can inspect the DG set any time.

Character verification of personnel engaged will be the responsibility of contractor. If the performance of any person is found unsatisfactory the contractor should replace immediately.

Dismantling of all parts of cantilever and small parts of steel work associated with cantilever assembly and shall be handed over by the Contractor to the concerned SSE/TRD depot at concerned place.

Transportation charges for OHE material Includes picking up, loading, un-loading and transportation of only railway supplied material by contractor's own tools and labors and vehicles from nominated places as specified by the railway representative/consignee to the work site or any other places. The price shall also cover picking up, loading, leading and transportation of Railway released material from site by contractor's own tools and labors and vehicles from site to concerned SSE/TRD depot at concerned place or any other nominated places as specified by the railway representative/consignee.

3.2.2 Regulated high rise type OHE with normal contact wire height 7.57 Metre

S.N.	From Station to Station	km to km	Total Track km	Remarks
	Nil			

3.2.3 Regulated Tramway type OHE with normal contact wire height 5.80 metre

S.N.	From Station to Station	km to km	Total Track km	Remarks
	Nil			



3.2.4 Regulated tramway type high rise OHE with normal contact wire height 7.57 metre.

S.N.	From Station to Station	km to km	Total Track km	Remarks
	Nil			

3.2.5 Unregulated conventional type OHE with normal contact wire height 5.80 metre.

S.N.	From Station to Station	km to km	Total Track km	Remarks
	Nil			

3.2.6 Unregulated type OHE high rise with normal contact wire height 7.57 metre.

S.N.	From Station to Station	km to km	Total Track km	Remarks
	Nil			

3.3 25 kV Sub-sectioning post (SSP) (Switching Post) for 2×25 kV Traction System

The Scope of work shall include but not be limited to Design, supply, erection, testing and commissioning of Switching Posts (SSP) for 2x25kV traction system for V-connected Transformer TSS including Foundations, Structures, various type of equipments including auto transformers, auxiliary transformer, 50kV -25kV double pole circuit breakers, 25kV double pole interrupters, 25kV double pole isolators, 25kV PT- Type-I, 42kV LA station and all ancillary equipment along with control & Relay Panel, Earth work, construction of control buildings, fencing, retaining wall, entry gate, Internal Wiring with switch/fittings/equipments, Battery Set, All types of caution, warning, instruction, protection, location/Name and schematic diagram boards, earthing stations, Safety items (i.e. Fire fighting equipment, First Aid box, Shock treatment chart, key box), manning till stabilization of SCADA (At least for a period of 06 months from commissioning), feeder, cross feeder, cross feeder to OHE and all necessary documentation for EIG sanction and PCEE/ CRS Inspection, supply of drawings, complete assistance till successful statutory inspection of the installations including



handing over of all assets, supervision of maintenance with breakdown attending (during Defect Liability Period) and all other works provisioned in EPC agreement for following details.

Note: - Work shall be executed in accordance with PSI guideline for increasing speed potential to 160 KMPH on Indian Railways Instruction No. TI/IN/0043 Rev.1 including amendments, if any or Latest.

S.N.	Location	Chainage	Type of Switching Post	Remarks
1	Jataha	-	2x25 SSP	SSP to be designed for single line section with provision of expansion in future for double line section.

SSP – to be designed for switching over new line section of Paniahwa – Madhubani

RDSO Drawing no. – TI/DRG/PSI/AT/RDSO/00036/20/01 MOD-A or latest to be used for SSP in 2x25kV AT System for V-connected transformer TSS, and to be designed for single line section, with provision of expansion in future for double line section

Work of control building incl. general power supply, yard lighting, approach road, retaining wall included in the scope of work.

Telecom supply of OFC from nearest OFC hut to control room building to be provided and included in the scope of work.

Protection - Technical Specification No. TI/SPC/PSI/PROTCT/7101 or latest for Control and Relay Panel Including Numerical type protection relays for Sectioning and Paralleling Post, Sub-Sectioning and Paralleling Post and boundary SP in scheme of V-connected transformer TSS shall be referred.

Earthing – as per RDSO Specification no. TI/SPC/PSI/ERTHNG/0210 is to be provided. The neutral of the Auto transformers at SSP should also be connected to Buried Rail as mentioned in the specification.

The main equipment to be used for SSP in V-connected transformer TSS along with their Specification is detailed as under-

Item description	Specification	Qty for 1 SSP
16.5MVA Auto Transformer (55/27.5kV) with	TI/SPC/PSI/AUTOTR/1200(02/21)	2



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Item description	Specification	Qty for 1 SSP
Bushing CTs		
25 kV Double Pole Isolator (Manual) (2000A)	TI/SPC/PSI/ISOLTR/0210(06/21) with A&C slip no. 01	10
25 kV Double Pole Isolator (Motorised) (2000A)	TI/SPC/PSI/ISOLTR/0210(06/21) with A&C slip no. 01	2
25 kV Double Pole Vacuum Circuit Breaker (2000A)	TI/SPC/PSI/LVCBIN/0121(05/23)	2
25 kV Double Pole Vacuum Interrupter (2000A)	TI/SPC/PSI/LVCBIN/0120(12/13) with A&C slip no. 01	4
25 kV Single Pole Isolator (Manual) (2000A)	TI/SPC/PSI/ISOLTR/0210(06/21) with A&C slip no. 01	0
25 kV Single Pole Isolator (Motorised) (2000A)	TI/SPC/PSI/ISOLTR/0210(06/21) with A&C slip no. 01	0
25 kV Single Pole Vacuum Interrupter (2000A)	TI/SPC/PSI/LVCBIN/0121(05/23)	0
25kV Dropout Fuse Switch	ETI/PSI/14(01/86) with A&C slip no. 01	2
25kV Potential Transformer (Type-1)	TI/SPC/PSI/PT/0210 (06/21)	4
25kV Support Insulator	TI/SPC/OHE/INS/0070 (04/07) with A&C slip no. 01 & 02	As required
25kV/240V LT Supply Transformer (10kVA)	ETI/PSI/15 (08/03)	2
42kV Lightning Arrester	TI/SPC/PSI/MOGLTA/0101 (02/15)	8
50kV Double Pole SF6 Circuit Breaker (2000A)	TI/SPC/PSI/HVCB/0121 (05/21) with A&C slip no. 01	0
Low Tension Distribution Panel	TI/SPC/PSI/LTDPNL/0210 (10/21)	2

Lead Acid Batteries 110V, 150AH as per RDSO Spec No - RDSO/PE/SPEC/TL /0040 (Rev. '2') - 2021 or latest

110 V Battery Charger suitable for Lead Acid Batteries 110V, 150AH as per RDSO Spec No -TI/SPC/PSI/40-150/ CHGR/1210 (07/21) or latest

Equipments inside control room as per material list included in RDSO Drg no. – TI/DRG/PSI/CR2X25/SPSSPATP/0210 or latest and erection as per this drawing only

Submission of detailed drawings of Each SSP as per site condition based on the latest drawings, layout & specifications issued by RDSO.

In case of any modifications required as per the latest specifications as and when issued by RDSO, necessary changes will be incorporated by the tenderer and obtain final approval of the same before starting the execution of work.

SSP is constructed on Greenfield Sites: The execution could be done for



complete SSP at a time. Planning might be done accordingly. Site specific design may be done by contractor and got approved from authority.

The Fully compacted level of Earth filling in SSP should be kept as 900mm above the natural ground level or 600mm above HFL (High Flood Level) whichever is higher. The plinth level of the building of these installations may be kept above switch yard level as per Civil engineering requirement. As per CORE letter no.-CORE/Engg.Project/Common Dated-12.11.2020. The contractor should collect the data of HFL & proposed level of earth filling should be submitted to competent authority for approval.

The Contractor shall provide the online monitoring of the work sites during construction phase through Mobile/Laptop with provision of CCTV cameras. For each SSP there shall be at least four CCTV cameras installed at the work site.

Para 8.3 of RDSO Instruction No. – TI/IN/0043 Rev-1 or latest to be followed for other miscellaneous drawings.

3.4 25 KV Booster Transformer and return conductor arrangement [Specify scope of booster transformer stations]

S.N.	From Station to Station	km to km	Length of RC (Metres)	Remarks
Nil				

3.5 25 KV Auxiliary transformer stations

The Scope of work shall include but not be limited to design, supply, erection, testing and commissioning of single phase Auxiliary Transformer Station of different capacity as per following details, complete with all structures and fittings along with drop-out fuse, jumper connection to OHE, anti-climbing device, earthing station and all types of caution, warning, instruction, protection boards and location/Name boards, junction box and all necessary documentation for EIG sanction and PCEE/ CRS Inspection, supply of drawings, complete assistance till successful statutory inspection of the installations including handing over of all assets, supervision of maintenance with breakdown attending (during Defect Liability Period) and all other works provisioned in EPC agreement for following details –

S.N.	Location	Capacity	Quantity	Remarks
1	Chhitauni	10 kVA	01 No.	
2	Jataha	10 kVA	01 No.	
3	Madhubani	25 kVA	01 No.	

Supply, erection, testing & commissioning of 25 kV/240V, 50Hz, single phase, oil filled 10 kVA Auxiliary Transformer with complete accessories.

The transformer shall be purchased from RDSO/CORE approved supplier



only and shall confirm to RDSO Spec. No ETI/PSI/15(8/2003) with CS no. 1 or latest.

Silica breather, adjustable split arcing horns provided on primary bushing side having horn gap setting vary between 125 to 250 mm.

Power cable size 2x70 mm² (of required length) to be connected between LT terminal & junction box. LV junction box as per RDSO Drawing ETI/PSI/0310 or latest.

25 kV Dropout fuse switch assembly including solid core insulator & fuse wire on AT mast as per Drawing No. ETI/PSI/032 REV-D, ETI/PSI/038 REV C or latest & specification no. ETI/PSI/14 (1/86) Rev.1 (4/87) or latest for DO Fuse switch.

Provide the Anti-climbing device on the structure including cost of bolt, barbed wire net, nuts, angle clamps as per Drawing No. ETI/PSI/037 or latest.

PG clamp, suspension clamp (RI-1160), single clevis (RI-1270) with other associated fittings necessary for copper Jumper connection between OHE, DO fuse assembly and AT HT terminal as per Drawing No. RE/42/CG/05521 or latest.

Jumper Wire, long creepage path solid core 9 tone porcelain Insulator (RI No. 6020-1,1050 mm CD) as per RDSO specification No. TI/SPC/OHE/INS/0070(04/2007) or latest with all required fasteners, fittings.

All the material required for provision of additional Arcing Horn across 9T insulator as per RDSO drawing no. TI/SK/PSI/ARCHON/RDSO/00001/08/0 or latest the price shall also cover the supply of an enamelled number plate.

All material for earthing as per RDSO Drawing No. ETI/PSI/708 or latest in all respect.

8 SWG GI wire of required length with termination connectors for earthing connection of LV box to earth electrode.

AT LV terminals to be connected with MCB with suitable connectors and cable (size 2x70 mm² Al.) along with gland and terminal lug.

Copper jumper wire (65 mm²) of suitable length along with PG clamp, suspension clamp (RI-1160), z single clevis (RI-1270) with other associated fittings and shall be provided for connection between OHE, DO and AT HT terminal as per Drawing No. RE/42/CG/05521 or latest. Oil filtration and pre- commissioning tests as approved by the Employers or Engineer. The contractor shall make his own arrangement for oil filtration equipment, as well as power supply required for the same. All necessary tools, equipment, instruments required for carrying out oil filtration/checks/tests/commissioning shall be arranged by the contractor.



Supply, erection, testing & commissioning of 25 KVA 25 kV/240 V Auxiliary Transformer complete with accessories.

The transformer shall be purchased from RDSO/CORE approved supplier only and shall confirm to RDSO Spec. No ETI/PSI/15(8/2003) with CS no. 1 or latest.

bushing side having horn gap setting vary between 125 to 250 mm. Power cable size 2x150 mm² (of required length) to be connected between LT terminal & junction box. LV junction box as per RDSO Drawing ETI/PSI/0310 or latest.

25 kV Drop out fuse switch assembly including solid core insulator & fuse wire on AT mast as per Drawing No. ETI/PSI/032 REV-D, ETI/PSI/038 REV C or latest & specification no. ETI/PSI/14 (1/86) Rev.1 (4/87) or latest for DO Fuse switch.

Provide the Anti-climbing device on the structure including cost of bolt, barbed wire net, nuts, angle clamps as per Drawing No. ETI/PSI/037 or latest.

PG clamp, suspension clamp (RI-1160), single clevis (RI-1270) with other associated fittings necessary for copper Jumper connection between OHE, DO fuse assembly and AT HT terminal as per Drawing No. RE/42/CG/05521 or latest.

Jumper Wire, long creepage path solid core 9 tone porcelain Insulator (RI No. 6020-1,1050 mm CD) as per RDSO specification No. TI/SPC/OHE/INS/0070(04/2007) or latest with all required fasteners, fittings.

All the material required for provision of additional Arcing Horn across 9T insulator as per RDSO drawing no. TI/SK/PSI/ARCHON/RDSO/00001/08/0 or latest the price shall also cover the supply of an enamelled number plate.

All material for earthing as per RDSO Drawing No. ETI/PSI/708 or latest in all respect.

8 SWG GI wire of required length with termination connectors for earthing connection of LV box to earth electrode.

AT LV terminals to be connected with MCB with suitable connectors and cable (size 2x150 mm² Al.) along with gland and terminal lug.

Copper jumper wire (65 mm²) of suitable length along with PG clamp, suspension clamp (RI-1160), single clevis (RI-1270) with other associated fittings and shall be provided for connection between OHE, DO and AT HT terminal as per Drawing No. RE/42/CG/05521 or latest.

Oil filtration and pre- commissioning tests as approved by the Employers or Engineer. The contractor shall make his own arrangement for oil filtration



equipment, as well as power supply required for the same. All necessary tools, equipment, instruments required for carrying out oil filtration/checks/tests/commissioning shall be arranged by the contractor.

3.5 Traction sub-stations (TSS)- Deleted

3.6 High voltage transmission line from grid sub-station to railway TSS

Deleted.

3.6.1 Overhead transmission line

S.N.	Location	Total length in km	Nominal Voltage level	Single Circuit/ Double Circuit	3-Phase/ 2- Phase	Remarks
Nil						

3.6.2 Monopole overhead transmission line

S.N.	Location km to km	Total length in km	Nominal Voltage level	Single Circuit/ Double Circuit	3-Phase/ 2- Phase	Remarks
Nil						

3.7 Underground high-tension cable transmission

S.N.	Location km to km	Total length in km	Nominal Voltage level	Single Circuit/ Double Circuit	3-Phase/ 2- Phase	Remarks
Nil						

3.8 Bay augmentation work at grid sub-station [Specify scope of work]

S.N.	Location	Nominal Voltage level	Number of bays	Remarks
Nil				

3.9 Supervisory control and data acquisition system (SCADA).

Supervisory control and data acquisition system (SCADA) for 2x25 KV Sub-sectioning and paralleling post (SSP) The Scope of work shall include but not be limited to design, drawing, supply, erection, testing & commissioning of Standard Supervisory Control and Data Acquisition (SCADA) equipments as per RDSO Specification No TI/SPC/ RCC/ SCADA /0134 or latest in the proposed section including as per specification RTU for 01 nos. SWS through SCADA



approved vendors with defect liability period of 2 years including supply of special tools & plants for maintenance, and all necessary documentation for EIG sanction and PCEE/ CRS Inspection, supply of drawings, complete assistance till successful statutory inspection of the installations including handing over of all assets, supervision of maintenance with breakdown attending and all other works provisioned in EPC agreement for following details:

Note: - Work shall be executed in accordance with RDSO Technical Specification No. – TI/SPC/RCC/SCADA/0134 including amendments, if any or latest for SCADA for 2x25kV single phase 50 Hz AC Traction Power Supply.

Paniahwa (Excl) – Madhubani (Incl) section of Varanasi Division, NER

S. N.	Item	Quantity	Remarks
1	SCADA Equipment at Switching Posts (SSP)	1 No.	As per para 3.2

Description	Unit	Qty.
Supply, Erection, Testing & Commissioning of Remote Station Equipments at remote stations as per RDSO Spec No. TI/SPC/RCC/SCADA/0134 with amendments for SSP	No.	1

The provision of all equipment/items including power supply units as mentioned in RDSO Specification No. TI/SPC/RCC/SCADA/0134 with latest amendments and the steel cubicles required for housing the RTUs, interconnecting cables and wiring and all materials necessary for proper functioning of the RTUs shall be done. The testing of materials and equipments at the manufacturer's works shall be done. The RTU shall be supplied in accordance with RDSO's standard specification and capable of successful working on standard communication protocol as defined in the specification.

Provision of separate earthing of communication cable shield at controlled stations shall be done.

RTUs supplied for the controlled posts shall include the necessary transducers, summation CT', PT, supply change over arrangement, digital analogue input modules, limit settings, CPU cards, power supply unit, surge arrestor, relays and contactors at SSP for different analogue parameters and measurements as per mentioned in the specifications and tender documents

The SCADA material to be procured from RDSO approved source only.

The Inspecting authority for the work shall be RDSO/RITES/Railway's representative.

3.10 Automatic Fault Locator for 2x25kV Traction Systems

3.10.1 Automatic Fault Locator (AFL) for 2x25 KV Sub- sectioning and paralleling post(SSP).The Scope of work shall include but not be limited to design, drawing, supply, erection, testing & commissioning of Automatic Fault Locator (AFL) measuring unit in all respect along with all associated fittings, accessories as per RDSO Specification No TI/SPC/PSI/AFL/0240 or latest technical specifications and erection of Automatic Fault Locator with



wall mount rack for OFC Hut for AFL System should be done at SSP(01 no. each) by proper dressing of cables in sec.of Paniahwa (Excl.) – Madhubani (Incl.) section of Varanasi Division, NER with defect liability period of 2 years.

Requirements of AFL Installation at site:

After Supply and before installation of AFL unit,contractor must submit the reports of field trails,completion of trails,prototype approval to railway authority.

S. N.	DESCRIPTION OF ITEM	UNIT	Quantity
2(a)	"Supply of Automatic Fault Locator (AFL) including One numbers of Measuring Unit (MU)for 2x25KV AC traction system based on auto transformer neutral current ratio as per RDSO latest Specification for SSP"	Number	01 for Each
2(b)	"Erection, testing and commissioning of Automatic Fault Locator (AFL) including One numbers of Measuring Unit (MU) for 2x25KVAC traction system based on auto transformerneutral current ratio as per RDSO latest Specification for SSP"	Number	01 for Each

3.11 Various electrical general services works

3.11.1 All the general services electrical works shall be carried out as per ‘Specifications & Standards for Construction’ issued by Railway Board. Subsequent sections elaborate the various general services works. The various annexures mentioned in subsequent parts refer to the annexure ascontained in the ‘Specifications & Standards for Construction’ issued by the Railway Board.

3.11.1.1 Scope of the general services works at various Stations/Halts/SSP/TW Shed/OHE cum PSI depot locations under the scope of EPC Contract shall include but not be limited to design, supply, testing and commissioning (complete in all respects) of following as per relevant standard & specifications:

- Electrification of Station/Halt Station buildings with concealed wiring.
- Electrification of SSP/TW Shed/OHE cum PSI depot buildings with concealed wiring.
- Electrification of Staff Quarters buildings with concealed wiring.
- Electrification/Lighting of Platform area (Covered platform shed & Open area)
- Electrification/Lighting of FOB/RUB



- f) Electrification/Lighting of Circulating area/ Service roads / Internal roads / Approach roads / Footpaths.
- g) General Electrification works of service buildings covered under the construction of EPC contract.
- h) Provision of submersible pump (12.5/15HP at Stations) with control panel and accessories for Station/Staff quarters.
- i) Provision of bore well electric pumps (1HP) or necessary pipeline connection from the nearest Railway water supply point at OHE cum PSI depot.
- j) Extension of LT power supply for CLS Work.
- k) Electrification/Lighting of Goods platform areas.
- l) Any modification of the electrical distribution system as necessary for all the above.
- m) Signage's as required at all the Stations/Halts/SSP areas under EPC contract. Standard Digital Signages for stations and other premises to be ensured as per the guidelines issued by Railway board vide letter No.2023/SD-II/22/07/02 dated 15.05.2023.
- n) All the above Electrical installation drawings in 3 copies on tracing paper to be submitted to the Competent Authority for approval.

3.11.1.2 All the electrical appliances and fittings should be complete with driver and all other accessories as per Indian Railway Specification. All light fittings shall be LED type. The electrical Installation work shall be carried out in accordance with Indian Standard Code of Practice. It shall also be in conformity with the current Indian Electricity rules and regulations and requirements of the Local Electricity Supply Authority and Fire Insurance regulations so far as these become applicable to the installation.

Sufficient number of light points/ power points shall be provided for using various house keeping electrical/ electronic gadgets in common areas.

The size of the copper cable/ wires used for internal wiring shall be as follows:

- Light Point wiring for single & two points - 1.5 Sq mm
- Light Point wiring for more than two points - 2.5 Sq mm
- Light Plug Wiring - 2.5 Sq mm
- Power Plug (6/ 16 Amp Socket outlet) - 4.0 Sq mm
- Power Plug (20/ 30 Amp MCB) - 6.0 Sq mm
- Circuit Wiring from DB to First Switch - 2.5 Sq mm
- The size of the earth continuity conductor shall be the same as phase wire.



- Cable of size up to 16 Sq m will be of copper and above will be that of aluminium conductor.
- For wiring of higher capacity outlets, size of wires will be decided keeping in view load and distance from DB.

CONDUITS -

- All conduits for concealed/ surface/ exposed installation including conduits running above false ceiling shall be of medium protection with stove enameled MS conduits. All conduits installed below ground level or in the damp/ wet area shall be 'A' Class G.I.s. All conduits for fire alarm systems irrespective of surface or concealed shall be of MS conduits painted with post office red color.
- PVC Conduits: In any special area the Non-metallic conduits and accessories shall conform to IS 9537 (part 3), IS: 3419 and each conduit shall bear the ISI Mark. PVC conduits shall be medium class as per IS:9537 (Part-3) round. The conduit shall be plain end type as specified in IS:9537 (Part-3). The conduit's internal surface shall be smooth. Only approved quality factory made bends/ accessories shall be used unless otherwise stated. Minimum size of conduits shall be 20 mm diameter and wall thickness shall be as per IS:9537 (Part-3) for medium class.
- Metal Conduits: Conduits and Accessories shall conform to IS: 9537 (Part-2). Solid drawn, screwed steel conduits protected by black stove enamel shall be used. Where conduits for buried wiring are passing underground, they shall be of galvanized steel conduit. Joints between conduits and accessories shall be securely made to ensure earth continuity.
- No steel conduit less than 20 mm in diameter shall be used. Conduits shall be solid drawn, lap welded, with minimum wall thickness of 1.6 mm for conduits up to and including 32 mm diameter and 2 mm wall thickness for conduits above 32 mm diameter.
- The conduits shall be delivered to the site of construction in original bundles and each length of conduit shall bear the label of the manufacturer & ISI Mark (Engraved Markings) or painted markings.
- Conduit accessories such as bends, coupling shall be conforming to relevant Indian Standard Specifications.

DISTRIBUTION BOARDS -

- For connection of lighting/ power circuits, MCB type distribution boards shall be provided suitable for 3 phase 415 V and single phase 230 V.
- All distribution boards shall be fabricated from 1.6 mm thick sheet and shall be of double door construction. The incomers shall be with MCCB/ MCB. In each phase 30m AELCBs/RCCBs shall be provided for protection against earth leakage. All Distribution boards shall be with IP42 protection.
- MCBs shall be of 10 kA fault rating and capacity shall be as per load requirement.



- Distribution boards, MCCB, MCB, ELCB shall be of reputed manufacture and same make.
- Distribution boards shall be provided in an accessible location.
- Each circuit load shall not be loaded with more than 1000-Watt load. Minimum wire size shall be for sub circuit wiring for light points 2.5 sq.mm and for power 4.0 sq.mm with FRLS Cu wire. Separate neutral to be pulled for each circuit.
- For External feeders all above specifications except IP protection which shall be IP67 shall be followed. All cable entries for the External feeder pillar shall be from bottom. All External feeders shall be provided with Real time delay timer with Day light sensor and contactor for Automatic operation.
- All distribution boards and Feeder pillars shall be provided with RAL-7032 Powder coating.

LIGHTING AND FANS -

- General lighting of various common areas shall be planned as per NBC-2016 and Guidelines issued by the Ministry of Railways.
- Internal Lighting has to be done for all areas of the Station Building. Electrification of all stations, service buildings, LC gates, end goomties as per Railway board guidelines and minimum lux level to be maintained.
- Electrification of all LC gates, Station platforms (with 30%-70% Automatic Control system to save energy), yards, circulating area, approach road, Cabling and Lighting arrangements at ROB/RUBs as per the details given by the civil engineering department.
- All Energy efficient reputed brand LED Lighting Should be 5 star BEE Ratings. The minimum lux level to be maintained in station premises/circulating area to be ensured.

S.N.	Location	Approved Lux Levels
1	Concourse	140
2	Circulating Area	50
3	Waiting Hall	150
4	Retiring Hall	100
5	Platform	
	a) Open	50
	b) Covered	140
6	Enquiry cum Reservation office	
	a) General	150
	b) Counter	150
7	Covered Passage way	
	a) Corridors	50
	b) FOB	50
	c) Stairs	50
8	Parcel/Luggage office	
	a) General	100
	b) Counter	150
9	Time Table	200



S.N.	Location	Approved Lux Levels
10	Outdoor parking	50
11	Restaurant Area	
	a) Kitchen	200
	b) Stores	150
	c) Dining Hall	200
12	Other Service building at station	200
13	Cloak Room	
	a) General	100
	b) Counter	150
14	Public Utility Service (Toilet/Bathroom)	100

- All LED fixtures must be as per latest specification of Railway Board.
- For ventilation of various areas ceiling fans shall be provided in offices/small cabins, waiting rooms, platforms BLDC fans to be provided as per PCEE/NER specification No. Elect/Store/Policy/Part-III/546 dated 10.08.2023.
- Energy efficient exhaust fans to be provided in wash areas, S&T installation, battery rooms, power rooms, stores.

INSTALLATION -

- Installation of all electrical services as per relevant codes, standard, guidelines & Policies to be followed.
- The light fixtures and fittings shall be assembled and installed in position complete and ready for service, in accordance with details, drawings, manufacturer's instructions and to the satisfaction of the Construction manager/ Consultants. Pendent fixtures specified with overall stem lengths are subject to change and shall be checked with conditions on the job and installed as directed. All suspended fixtures shall be mounted rigid and fixed in position in accordance with drawings, instructions and to the approval of the competent authority. Fixtures shall be suspended true to alignment, plumb level and capable of resisting all lateral and vertical forces and shall be fixed as required.
- All suspended light fixtures, fans shall be provided with concealed suspension arrangement in the concrete / roof members. It is the duty of the Contractor to make these provisions at the appropriate stage of construction. Exhaust fans shall be fixed at locations shown on drawings. They shall be wired to a plug socket outlet at a convenient location near the fan. All switches and outlets, for fans and light fittings shall be bonded to earth. The recessed type fixtures shall not be supported into the false ceiling framework. This shall have independent support from the socket of ceiling using conduit down rods/ steel chain with provision for adjusting the level of fitting. Wires shall be connected to all fixtures through connector blocks. Wires brought out from junctions shall be encased in flexible pipes for connecting to fixtures concealed in suspended ceiling. The flexible pipes shall be check-nut to the junction with a brass bush. Double check-nut at the fixture and flexible pipes,



wherever used shall be of make and quality approved by the competent authority.

CABLE TRAY –

- Cable Trays to be perforated type/ Ladder Type and will be installed under the Ceiling or on Wall. All joints, bends, tees, reducers, connectors to be factory fabricated. Site fabrication will not be accepted. The cable trays to be Hot Dipped galvanized in the works of the manufacturer.
- The ladder/ perforated cable tray to be properly fixed with channels, angles, tie rod, flats to the ceiling. The metal inserts for fixing channels, angles, tie rod, flats to be put in place while casting the tray. If insert plates are not placed in position, Anchor fasteners to be used to support cable trays if required. The cable tray route to be coordinated with other services to avoid criss-cross of all the services. While laying the cables on the tray minimum one cable diameter distance to be observed between two adjacent cables and about 20% space to be kept spare for any future installation. The width of the cable tray to be selected so as to accommodate the required number of cables to be laid on it. The cables to be tied with the cable tray with GI clamps as per item.
- The perforated cable trays to be made of having not more than 17.5% perforation and thickness and depth to be as under:
 - Width 600 mm and above- 75 mm deep, 2.0 mm thick.
 - Width 100 mm and above and less than 600 mm- 50 mm deep, 1.6 mm thick.
 - Width less than 100 mm- 25 mm deep, 1.0 mm thick.
- The ladder type cable trays to be fabricated as under:
 - Width 1000 mm and above- Runners 25 x 100 x 25 x 3 mm, Rungs 20 x 40 x 20 x 3 mm @250mm center to center.
 - Width below 1000 mm - Runners 25 x 75 x 25 x 2.5 mm, Rungs 20 x 30 x 20 x 2.5 mm @250mm center to center.

POWER DISTRIBUTION SCHEME –

- LT Power from transformers and DG sets shall be brought to Main LT Panels/synchronizing through sandwich type bus ducts. Power shall be distributed to respective loads through a network of LT Panels, bus ducts, LT XLPE Insulated, FRLS PVC inner and outer sheathed armored Cables which shall be laid on Cable trays both for horizontal & vertical runs cabling.
- Size of the cable should be designed 1.5 times capacity of calculated load. Approval of competent authority to be taken for proposed power supply, cable laying, internal wiring diagram for power and lighting load.
- The power distribution shall be designed for 6% voltage drop from source to load, as per NBC-2016.
- Bulk load is fed directly from the main panels installed in the sub-station.
- Load will be distributed on all the transformers and in the event of failure of one transformer, it will be possible to transfer load by closing the bus-coupler for priority load basis.

CABLE TAGS -



- Cable tags to be made out of 2 mm thick aluminum sheets, each tag 32 mm in dia. with one hole of 2.5 mm dia. 6 mm below the periphery to be provided for clamping the same with cables.
- Cable designations are to be punched with letter/ number punches and the tags are to be tied to cables with piano wires of approved quality and size. Tags to be tied inside the panels beyond the glands as well as below the glands at cable entries. Along trays, tags are to be tied at all bends on straight lengths, tags to be provided at every 15 meter.

EXTERNAL LIGHTING -

- The Contractor will design, supply, install and commission the external lighting including 16m long high mast with 9 nos of 200W flood light as required.
- The light fixtures used shall have an ingress protection rating of IP-65 or higher as per application.
- For station platform 6m single/double bracket as per site requirement octagonal pole to be provided.
- For circulating area 7m pole with single/double bracket as per site requirement octagonal pole to be provided.
- For circulating area 60W LED flood light to be provided in street poles.
- For platform area 30W LED flood light to be provided in street poles.

ENERGY CONSERVATION –

Following measures are proposed for energy conservation:

- All Motors to be with efficiency IE-3 as per IS-12615.
- Power factor to be maintained automatically near unity as far as possible with APFC Relays. This will reduce power distribution losses.
- Copper conductor wires/ cables are proposed for sizes up to 16 Sq mm. This will reduce losses and improve reliability.
- The power distribution shall be designed for 6% voltage drop from source to load, as per NBC-2016.
- All cables shall be derated to reduce losses. This will avoid heating of cables & improve reliability.
- As per Railway Board Energy efficiency Policy Letter No. 2022/EEM/150/09 dated 30.12.2022, Energy efficient equipment of star rated reputed brands VIZ LED Lights, BLDC Fans, 5 Star rated Inverter AC Units, type Air conditioners, Pumps, DG Sets, Transformers, adoption of low carbon cooling system/two stage evaporative/radiant cooling system and Energy Conservation Measures like provision of Natural Daylights, automation of pumping, PF lighting, Pit line lighting, intelligent water management system are to be ensured.

3.11.1.3 Electrification of Stations/Halts (Chhitauni, Jataha and Madhubani)

The Scope of work shall include but not be limited to design, supply, erection, testing and commissioning of Wiring of light point, fan point with electronic regulator, 5A plug point, 15A power point, call bell point by suitable size FRLS PVC insulated multi stranded copper conductor wires 1100 volt grade conforming to IS:694 (Latest version) laid through



Recessed/surface PVC conduit pipe for wiring/sub-main/main as required including connection. Earth wire shall also be insulated and of the same cross-sectional area as phase wire. Color Code shall be maintained for the entire wiring i.e., Red, Blue & Yellow for phase wires, black for neutral & green for earth wire.

The wiring should be concealed and switch, sockets, electronic regulator should be modular type confirming to IS:3854/1997 (Latest version)/flush type socket outlet as per IS:1293-1988 (Latest version) complete with GI box, modular base & cover plate.

SETC of Out door type feeder pillar box made of cold rolled steel sheet 2 mm thick comprising 4 Nos. 400A copper bus-bar, incoming and outgoing cable entry duct, hinged & locking arrangement and R, Y, B LED indication lamp, spray painting with 2 coats of red oxide primer & final painting with metal grey enamel paint.

SETC of LT distribution panel made of MS sheet 1.6 mm thick, reinforcement with 2.5mm thick members and channel arranging racks and shelves of suitable size manufactured in Confirming to IS-60947 and IS/IEC 61439 Part-1, Part-2, Part-3 & Part- 5 as applicable consisting with the following accessories : (i) Copper bus-bar 400A, 4 nos (ii) Incoming: MCCB 250A, 4 Pole, 25KA - 01 No (iii) Changeover switch 200 Amp 4-pole – 01 No, (iv) Outgoing: 100A 4 pole MCCB – 02 Nos (v) 63A 4 pole MCCB - 02 Nos, 32A 4 pole MCCB - 06 Nos, 25A 4 pole MCCB - 02 Nos, Breaking capacity. 25KA for rated current >100A and 10 KA for lesser rated current (vi) Indication lamp R,Y,B (LED) (vii) 3 Phase Energy Meter with CT - 1 set.

SETC of 16 Amps. 4 pole MCCB Breaking capacity -10 KA as per requirement at site.

EARTHING –

- All the non-current carrying metal parts of electrical installation shall be earthed as per IS: 3043. All equipment, metal conduits, rising main, cable armour, switch gear, distribution boards, meters, all other metal parts forming part of the work shall be bonded together and connected by two separate and distinct conductors to earth electrodes. Earthing shall be in conformity with the provisions of Rules 32, 61, 62, 67 and 68 of IER 1956.
- G.I. pipe shall be of medium class, 40 mm dia. and 4.5 m length. Galvanizing shall conform to relevant Indian Standards. The electrode shall be as far as practicable embedded below permanent moisture level. The electrode shall be made of one piece. The earth station shall also be provided with a suitable permanent identification label tag. The earth electrode shall conform to IS:3043 latest edition. The soil around the earthing electrode shall be treated to reduce the resistivity of the soil by filling the complete depth of electrode with alternative layers of charcoal and salt. The earthing should be as per Drg No. Dy. CEE(Con)/Gorakhpur/Standard/5/0498.



- The connectivity of metal parts of electrical installation to earth electrodes should be through GI wire/GI strip of suitable size as per direction of Railway authority.
- Earth resistivity test will be done by contractor to establish correct values and use the same for calculating overall earth resistance.

SETC of Insulating Rubber Mat of size 2 Mtr. X 1 mtr. X 1.5" for insulation purposes in front of the LT panel.

SETC of Fire Alarm sensor/Smoke detector unit, ceiling mounted, operating temperature – 10 degC to 60 degC.

Supply & laying of fire retardant, rodent proof double walled Corrugated (DWC) pipe of suitable size confirming to IS:14930 Part-II, along with all accessories (socket/coupler and T joint where ever required), including excavation of 110 cm depth and 40 cm wide cable trench, in all kinds of soil and its refilling with the same excavated soil and laying of DWC pipe of required size, for protection of power cable.

Supply & laying of XLPE insulated PVC sheathed LT cable 1100 volt grade upto 4 core of sizes upto 240 sq.mm direct laid in ground or through GI/HDPE pipe at a depth of 1M including excavation, sand cushioning, protective brick covering as per IS 1255/1983 (Latest version) and stone made Cable route marker complete in all respect. The cable end should be provided with suitable size cable end boxes and aluminium socket lug terminal.

Supply & making of Pucca cable trench (size 75 cm depth x 65 cm. vide) & its MS sheet cover to carry out the laying of LT cable of different sizes with the support of MS angle of size 25x25x3mm at 50 cm distance for cable protection. Also, cutting of CC work of wall & covering/ plastering of cutted CC work on wall by cement & sand mortar after laying of cable/wiring or for making new cable trench work complete in all respects.

Spare cable to be provided in the same trench with suitable separation by brick between the two cables. The cable route plan should be approved by competent authority.

Supply and erection of GI Pipe 100 mm dia medium gauge conforming IS:1239 Part-1 (2004) or latest for cable support and protection with suitable clamps on pole/wall/FOB/Shelter conforming to IS:1239 complete in all respects.

Supply and erection of GI Pipe 50 mm dia medium gauge conforming IS:1239 Part-1 (2004) or latest for cable support and protection with suitable clamps on pole/wall/FOB/Shelter conforming to IS:1239 complete in all respects.

Supply and erection of Aluminium alloy plate/sheet of suitable size & thickness for making protective covering of GI pipe /cabling work on wall or wherever required at site.



Supply, Erection, Testing & Commissioning (SETC) of G.I. hot dip galvanized perforated type cable tray of suitable size with cover, hardware as per IS:2629/4759 for cabling on wall/pillar/ground or wherever required complete in all respects.

SETC of Pre-wired 8 way SPN MCB DB with incoming 63A, 2-pole MCB-1 no and outgoing 6/10/16/20 A single pole MCB - 6 Nos, breaking capacity 10kA, bus-bar, neutral, earth link conforming to IS/IEC 60898-2;2003 and IS:13032/1991 including fixing its connection, earthing complete in all respect.

SETC of Pre wired 4 way TPN MCB DB with 4 pole MCB 63A-1 no and 6/16/32 A, MCB single pole - 12 nos (4 way in each phase), breaking capacity 10kA, busbar, neutral and earth link conforming to IS/IEC 60898-2;2003 and IS:13032/1991 including fixing its connection, earthing complete in all respects.

SETC of surface/ recess mounting, vertical type, 415 V, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 100A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCB i.e 100 A 4-pole MCB-1 No, 63 A DP MCB- 1 No, 32 A SP MCB- 2 Nos, 16 A SP MCB- 1 No, 10 A SP MCB - 1 No as required.

SETC of Pre wired 4 way SPN DB with incoming 20A MCB DP -1 No, 6-10 Amp MCB SP-4 Nos breaking capacity 10kA, bus-bar, neutral, earth link conforming to IS/IEC 60898-2;2003 and IS:13032/1991 including fixing its connection, earthing complete in all respect.

SETC of modular board with 25 Amp MCB- 1 no, modular socket-32 A - 1 no conforming to IS:8828-1996 & IS:13032/1991 including drilling holes on the wall/board, its connection, earthing complete in all respect for AC point.

SETC of 1200/1400 mm sweep, 5 star rated BLDC ceiling fan as per IS:374/2019 or latest in White Colour with 3 blade, speed control compatible to electronic regulator, input power 28W, brush less DC motor, Blade material aluminium, double ball bearing, 5 year warranty with 300mm down rod compete in all respect. BLDC fan should be as per PCEE/NER specification No.Elect/Store/Policy/Part-III/546 dated 10.08.2023.

SETC of Exhaust fan plastic body 300mm with louver shutter indoor type window/wall mounted as per IS: 2312 suitable for 230 Volt AC.

SETC of door call bell suitable for single phase 230V AC.

SETC of 3 KVA UPS Single phase suitable for 160V-260V, 50 Hz input supply with 2 hour backup at full load complete in all respects for PRS/UTS counter.

SETC of 18-20 watt LED tube light fitting with 5-year warranty complete in all respects as per PCEE/NER specification no. CEE/LED Tube Light 18-20 watt/01/2018 SETC of 16 watt LED emergency Light unit complete in all respects as per Railway board specification or latest.



SETC of LED Rope Light multi colour (Red, Yellow, Blue, Green, Warm White, Cool day light) 6 watt per mtr, 72 LED, 400 lumen, width-8 mm, height-6mm along with driver as per Railway board specification or latest. Make - Philips or Bajaj or Crompton SETC of LED Down lights round/square shape, 10 W suitable for single Phase 230 Volt AC as per Railway board specification or latest.

SETC of 5/6 Watt LED Down lights round/square shape suitable for single phase 230 Volt AC for concealed flush mounting in roof as per Railway board specification or latest.

SETC of LED High Bay lights, 80W, efficiency >130 lumen/watt, CCT - 6000K, CRI-90. The luminaries shall be IP-65 class I Protection and installation to high roof ceiling as required at site as per Railway board specification or latest.

SETC of Warm Yellow LED Facade Light 40 W suitable for single Phase 230 Volt AC as per Railway board specification or latest.

Design, Manufacturing, Supply, Installation, Testing & Commissioning of LED based signage board of different size & Single/Double side display as required in Hindi/ English/Urdu as required by Railway as per specification complete in all respects. Standard Digital Signages for stations and other premises to be ensured as per the guidelines issued by Railway board vide letter No.2023/SD-II/22/07/02 dated 15.05.2023.

SETC of BEE 5 Star rated Geyser 20 litre capacity, steel body, material of tank should be stainless steel suitable for 230 Volt single phase AC.

SETC of BEE 5 Star rated inverter type 1.5 Ton Split Type Air Conditioner along with 5 KVA stabilizer suitable for operation of 1.5 Ton Split AC with necessary copper piping and insulation material for connecting indoor unit to outdoor unit and nylon pipe 1 inch diameter for water drainage including saddle & clipping at every 1M interval/bends.

SETC of wall mounted digital timer based cyclic Auto change over comprising in built digital timer & contactors, connector, neutral link, LED indicator with wiring suitable for cyclic operation of 2 to 6 Air-Conditioner complete in all respects. Each AC can be kept ON from 1 hour to 24 hours.

SETC of Water Purifier similar to model Aquaguard classic AG 200 6000 L UV as per direction of competent authority at specified locations.

3.11.1.4 Electrification of FOBs, Platforms and associated works

The Scope of work shall include but not be limited to design, supply, erection, testing and commissioning of

EARTHING -

- All the non-current carrying metal parts of electrical installation shall be earthed as per IS: 3043. All equipment, metal conduits, rising main, cable



armour, switchgear, distribution boards, meters, all other metal parts forming part of the work shall be bonded together and connected by two separate and distinct conductors to earth electrodes. Earthing shall be in conformity with the provisions of Rules 32, 61, 62, 67 and 68 of IER 1956.

- G.I. pipe shall be of medium class, 40 mm dia. and 4.5 m length. Galvanizing shall conform to relevant Indian Standards. The electrode shall be as far as practicable embedded below permanent moisture level. The electrode shall be made of one piece. The earth station shall also be provided with a suitable permanent identification label tag. The earth electrode shall conform to IS: 3043 latest edition. The soil around the earthing electrode shall be treated to reduce the resistivity of the soil by filling the complete depth of electrode with alternative layers of charcoal and salt. The earthing should be as per Drg No. Dy. CEE(Con)/Gorakhpur/Standard/5/0498.
- The connectivity of metal parts of electrical installation to earth electrodes should be through GI wire/GI strip of suitable size as per direction of Railway authority.
- Earth resistivity test will be done by contractor to establish correct values and use the same for calculating overall earth resistance.

Supply & laying of fire retardant, rodent proof double walled Corrugated (DWC) pipe of suitable size conforming to IS:14930 Part-II, along with all accessories (socket/coupler and T joint where ever required), including excavation of 110 cm depth and 40 cm wide cable trench, in all kinds of soil and its refilling with the same excavated soil and laying of DWC pipe of required size, for protection of power cable.

Supply & laying of XLPE insulated PVC sheathed LT cable 1100 volt grade upto 4 core of sizes upto 240 sq.mm direct laid in ground or through GI/HDPE pipe at a depth of 1M including excavation, sand cushioning, protective brick covering as per IS 1255/1983 (Latest version) and stone made Cable route marker complete in all respect. The cable end should be provided with suitable size cable end boxes and aluminium socket lug terminal.

Supply & making of Pucca cable trench (size 75 cm depth x 65 cm. vide) & its MS sheet cover to carry out the laying of LT cable of different sizes with the support of MS angle of size 25x25x3mm at 50 cm distance for cable protection. Also, cutting of CC work of wall & covering/ plastering of cutted CC work on wall by cement & sand mortar after laying of cable/wiring or for making new cable trench work complete in all respects.

Spare cable to be provided in the same trench with suitable separation by brick between the two cables. The cable route plan should be approved by competent authority.

Supply and erection of GI Pipe 50 mm dia medium gauge conforming IS:1239 Part-1 (2004) or latest for cable support and protection with suitable clamps on pole/wall/FOB/Shelter conforming to IS:1239 complete in all respects.



Drilling of Horizontal bore by pushing method (trenchless technology) in all types of soil / rock below Railway track/road for laying of GI/CI/Spun/HDPE/DWC pipe of dia. up to 450 mm by pushing method in presence of Railway representative taking all necessary safety precautions related to track and movement of trains.

- Horizontal boring will be done at minimum 1.5 mtr below from ground level at railway track portion or road area. But in case, where the bank is high then boring should be such that the outer side and under track RCC/HDPE/DWC pipes are in the same alignment.
- All work will be done in presence of Railway representatives without disturbing the Railway track taking all necessary safety precautions related to track and movement of trains. Complete work will be carried out as per instruction & satisfaction of the representative of Railway at site.

Laying of HDPE pipe in already excavated trench under road/ground/floor/railway track as per site requirement size upto 75/80mm Dia wall thickness 3mm PN-4 conforming to IS 4984:1995 or latest as per site requirement.

- After laying of HDPE pipe, the trench should be refilled with the same soil and restored to original position & pipe should be laid in trench such that it is possible to withdraw the cable for repair or replacement.
- The pipe shall be laid with a gradient to facilitate drainage of water and it shall be right angle to the track, for each power crossing, contractor shall have to lay two lengths of pipe, for 02 Nos. of cable to be laid or as per instruction of site engineer.
- Accessories related with laying of HDPE pipe like fitting, bends joints/coupler, junction, flange end cap as per site requirement will be provide by contractor and no extra payment will be given for above items.
- The contractor shall arrange inspection of HDPE pipe at the manufacturer's premises before dispatch at his own cost if required by the railway and have to submit the manufacturer's test certificate of HDPE pipe.

Laying of HDPE pipe in already excavated trench under road/ground/floor/railway track as per site requirement size 160 mm dia (OD), wall thickness between 6.2 mm to 7.1 mm, material grade PE-80 and class of pipe should be PN-4 with confirming to IS: 4984/1995 of latest.

- After laying of HDPE pipe, the trench should be refilled with the same soil and restored to original position & pipe should be laid in trench such that it is possible to withdraw the cable for repair or replacement.
- The pipe shall be laid with a gradient to facilitate drainage of water and it shall be right angle to the track, for each power crossing, contractor shall have to lay two lengths of pipe, for 02 Nos. of cable to be laid or as per instruction of site engineer.
- Accessories related with laying of HDPE pipe like fitting, bends joints/coupler, junction, flange end cap as per site requirement will be provided by contractor and no extra payment will be given for above items.



- The contractor shall arrange inspection of HDPE pipe at the manufacturer's premises before dispatch at his own cost if required by the railway and have to submit the manufacturer's test certificate of HDPE pipe.

Wiring of light point, fan point, 5A plug point, 15A power point by suitable size FRLS PVC insulated multi stranded copper conductor wires 1100 volt grade confirming to IS:694 (Latest version) laid through Recessed/surface PVC conduit pipe as required including connection.

Earth wire shall also be insulated and of the same cross-sectional area as phase wire. Color Code shall be maintained for the entire wiring i.e., Red, Blue & Yellow for phase wires, black for neutral & green for earth wire.

The wiring should be through PVC conduit or perforated cable tray and switch, sockets should be modular type confirming to IS:3854/1997 (Latest version)/flush type socket outlet as per IS:1293-1988 (Latest version) complete with GI box, modular base & cover plate.

SETC of 18-20 watt LED tube light fitting with 5-year warranty complete in all respects as per PCEE/NER specification no.CEE/LED Tube Light 18-20 watt/01/2018.

SETC of 60 Watt LED street light fittings with 5 year warranty complete in all respects as per Railway board specification or latest.

SETC of 10 watt LED tube light fitting with 5 year warranty and fixing on wall/recess complete in all respects as per Railway board specification or latest.

SETC of heavy duty bracket type 750 mm sweep (30 inch) air circulating wall mounted fan, 1400 RPM, air delivery 270 m³/min, three blades suitable for single phase, 230V 50Hz without Regulator conforming to IS: 2997/64 with amendment-1 to 5. It should be mounted/fixed on MS pillar (in covered shed) with ceiling rose, MS clamps 50x6mm, bolts & nuts complete in all respects.

SETC of 1200/1400 mm sweep, 5 star rated BLDC ceiling fan as per IS:374/2019 or latest in White Colour with 3 blade, speed control compatible to electronic regulator, input power 28W, brushless DC motor, Blade material aluminium, double ball bearing, 5 year warranty with 300 mm down rod compete in all respect. BLDC fan should be as per PCEE/NER specification no. Elect/Store/Policy/Part-III/546 dated 10.08.2023 SETC of Exhaust fan plastic body 300mm with louver shutter indoor type window/wall mounted as per IS: 2312 suitable for 230 Volt AC.

SETC of Mobile charging board made of hardboard 10 mm thick, size 205 mm x 215 mm x 60 mm consisting of 04 Nos. 3-pin 6A socket with 6A switch, indication lamp and kit kat fuse on each board. The board should be fixed on the wall/pillar with suitable clamps as directed by the Railway authority.

Design, Manufacturing, Supply, Installation, Testing & Commissioning of LED based signage board of different size & Single/Double side display as required in



Hindi/ English /Urdu as required by Railway as per Specification complete in all respects. Standard Digital Signages for stations and other premises to be ensured as per the guidelines issued by Railway board vide letter No.2023/SD-II/22/07/02 dated 15.05.2023.

Supply & Erection of 6 mtr long G.I Octagonal pole with Standard double arm bracket (0.5 mtr long) made up of 48.3mm dia G.I.pipe suitable for road way LED Luminaires fitment at 30 degree from horizontal. The pole shall be pre fitted with FR Bakelite base sheet with 6 amp SP MCB fitted inside connection chamber having neoprene rubber gasket and 50 cm long examination door cover and 2x1.5 sq.mm FR PVC insulated unsheathed multi strand copper cable. The pole to be fixed on suitable size foundation of cement & concrete in 1:3:6 (Ratio concrete) including excavation, refilling & dressing up of the plinth.

SETC of self-contained drinking water cooler with (Non-CFC refrigerant R-134a) energy efficient compressor having 380 Liters storage capacity, 170 Liters/hr cooling capacity, 4-faucets, faster cooling, Eco friendly, stainless steel body, stainless steel tank in power saving PUF insulation, easy controls speedy drainage and suitable for single phase, 230 volts, 50 Hz AC complete in all respect.

SETC of Timer based semi automatic light control Panel Board consisting of 16 A, 4 Pole MCB - 5 Nos +16 A, 4 Pole contactor inbuilt digital timer switch -2 nos, all assembled inside 1 feet x 2 feet size CRCA Sheet Powder coated box complete and connection with light circuit as directed by Railway Authority.

SETC of 16 Amps. 4 pole MCCB Breaking capacity -10 KA.

SETC of G.I.hot dip galvanized perforated type cable tray of suitable size with cover, hardware as per IS:2629/4759 for cabling on wall/pillar/ground or wherever required complete in all respects.

Supply & wiring of point wiring/sub-main by 2.5 sq.mm FR PVC insulated multi stranded copper conductor single core cable conforming to IS: 694 (Latest version) laid through (Recessed/surface) PVC conduit pipe of suitable size with T-bend socket & other joints as required including connection testing & commissioning.

3.11.1.5 Electrification of Approach road, OHE depot, SSP and Tower Wagon shed

The Scope of work shall include but not be limited to design, supply, erection, testing and commissioning of;

EARTHING -

- All the non-current carrying metal parts of electrical installation shall be earthed as per IS: 3043. All equipment, metal conduits, rising main, cable armour, switchgear, distribution boards, meters, all other metal parts forming part of the work shall be bonded together and connected by two separate and



distinct conductors to earth electrodes. Earthing shall be in conformity with the provisions of Rules 32, 61, 62, 67 and 68 of IER 1956.

- G.I. pipe shall be of medium class, 40 mm dia. and 4.5 m length. Galvanizing shall conform to relevant Indian Standards. The electrode shall be as far as practicable embedded below permanent moisture level. The electrode shall be made of one piece. The earth station shall also be provided with a suitable permanent identification label tag. The earth electrode shall conform to IS: 3043 latest edition. The soil around the earthing electrode shall be treated to reduce the resistivity of the soil by filling the complete depth of electrode with alternative layers of charcoal and salt. The earthing should be as per Drg No. DyCEE(Con)/Gorakhpur/Standard/5/0498.
- The connectivity of metal parts of electrical installation to earth electrodes should be through GI wire/GI strip of suitable size as per direction of Railway authority.
- Earth resistivity test will be done by contractor to establish correct values and use the same for calculating overall earth resistance.

Laying of HDPE pipe in already excavated trench under road/ground/floor/railway track as per site requirement size upto 75/80mm Dia wall thickness 3mm PN-4 conforming to IS4984:1995 or latest as per site requirement.

- After laying of HDPE pipe, the trench should be refilled with the same soil and restored to original position & pipe should be laid in trench such that it is possible to withdraw the cable for repair or replacement.
- The pipe shall be laid with a gradient to facilitate drainage of water and it shall be right angle to the track, for each power crossing, contractor shall have to lay two lengths of pipe, for 02 Nos. of cable to be laid or as per instruction of site engineer.
- Accessories related with laying of HDPE pipe like fitting, bends joints/coupler, junction, flange end cap as per site requirement will be provided by contractor and no extra payment will be given for above items.
- The contractor shall arrange inspection of HDPE pipe at the manufacturer's premises before dispatch at his own cost if required by the railway and have to submit the manufacturer's test certificate of HDPE pipe. Laying of HDPE pipe in already excavated trench under road/ground/floor/railway track as per site requirement size 160 mm dia (OD), wall thickness between 6.2 mm to 7.1 mm, material grade PE-80 and class of pipe should be PN-4 with conforming to IS: 4984/1995 of latest.
- After laying of HDPE pipe, the trench should be refilled with the same soil and restored to original position & pipe should be laid in trench such that it is possible to withdraw the cable for repair or replacement.
- The pipe shall be laid with a gradient to facilitate drainage of water and it shall be right angle to the track, for each power crossing, contractor shall have to lay two lengths of pipe, for 02 Nos. of cable to be laid or as per instruction of site engineer.
- Accessories related with laying of HDPE pipe like fitting, bends joints/coupler, junction, flange end cap as per site requirement will be provided by contractor and no extra payment will be given for above items.



- The contractor shall arrange inspection of HDPE pipe at the manufacturer's premises before dispatch at his own cost if required by the railway and have to submit the manufacturer's test certificate of HDPE pipe.

Supply & laying of fire retardant, rodent proof double walled Corrugated (DWC) pipe of suitable size conforming to IS:14930 Part-II, along with all accessories (socket/coupler and T joint wherever required), including excavation of 110 cm depth and 40 cm wide cable trench, in all kinds of soil and its refilling with the same excavated soil and laying of DWC pipe of required size, for protection of power cable.

Supply & laying of XLPE insulated PVC sheathed LT cable 1100 volt grade upto 4 core of sizes upto 240 sq.mm direct laid in ground or through GI/HDPE pipe at a depth of 1M including excavation, sand cushioning, protective brick covering as per IS 1255/1983 (Latest version) and stone made Cable route marker complete in all respect. The cable end should be provided with suitable size cable end boxes and aluminium socket lug terminal.

Supply & making of Pucca cable trench (size 75 cm depth x 65 cm. wide) & its MS sheet cover to carry out the laying of LT cable of different sizes with the support of MS angle of size 25x25x3mm at 50 cm distance for cable protection. Also, cutting of CC work of wall & covering/ plastering of cutted CC work on wall by cement & sand mortar after laying of cable/wiring or for making new cable trench work complete in all respects.

Spare cable to be provided in the same trench with suitable separation by brick between the two cables. The cable route plan should be approved by competent authority.

Supply and erection of GI Pipe 50 mm dia medium gauge conforming IS:1239 Part-1 (2004) or latest for cable support and protection with suitable clamps on pole/wall/FOB/Shelter conforming to IS:1239 complete in all respects.

SETC of Pre-wired 8 way SPN MCB DB with incoming 63A, 2-pole MCB-1 no and outgoing 6/10/16/20 A single pole MCB - 6 Nos, breaking capacity 10kA, bus-bar, neutral, earth link conforming to IS/IEC 60898-2;2003 and IS:13032/1991 including fixing its connection, earthing complete in all respect.

SETC of Pre wired 4 way SPN DB with incoming 20A MCB DP -1 No, 6-10 Amp MCB SP-4 Nos breaking capacity 10kA, bus-bar, neutral, earth link conforming to IS/IEC 60898-2;2003 and IS:13032/1991 including fixing its connection, earthing complete in all respect.

Wiring of light point, fan point, 5A plug point, 15A power point by suitable size FRLS PVC insulated multi stranded copper conductor wires 1100 volt grade conforming to IS:694 (Latest version) laid through Recessed/surface PVC conduit pipe as required including connection. Earth wire shall also be insulated and of the same cross-sectional area as phase wire. Color Code shall be maintained for the



entire wiring i.e., Red, Blue & Yellow for phase wires, black for neutral & green for earth wire.

The wiring should be through PVC conduit or perforated cable tray and switch, sockets should be modular type confirming to IS:3854/1997 (Latest version)/flush type socket outlet as per IS:1293-1988 (Latest version) complete with GI box, modular base & cover plate.

SETC of 16 Amps. 4 pole MCCB Breaking capacity -10 KA.

SETC of 18-20 watt LED tube light fitting with 5-year warranty complete in all respects as per PCEE/NER specification no.CEE/LED Tube Light 18-20 watt/01/2018 SETC of 60 Watt LED street light fittings with 5 year warranty complete in all respects as per Railway board specification or latest.

SETC of 10 watt LED tube light fitting with 5 year warranty and fixing on wall/recess complete in all respects as per Railway board specification or latest.

Supply & Erection of 6 mtr long G.I Octagonal pole with Standard double arm bracket (0.5 mtr long) made up of 48.3mm dia G.I.pipe suitable for road way LED Luminaires fitment at 30 degree from horizontal. The pole shall be pre fitted with FR Bakelite base sheet with 6 amp SP MCB fitted inside connection chamber having neoprene rubber gasket and 50 cm long examination door cover and 2x1.5 sq.mm FR PVC insulated unsheathed multi strand copper cable. The pole to be fixed on suitable size foundation of cement & concrete in 1:3:6 (Ratio concrete) including excavation, refilling & dressing up of the plinth.

SETC of G.I.hot dip galvanized perforated type cable tray of suitable size with cover, hardware as per IS:2629/4759 for cabling on wall/pillar/ground or wherever required complete in all respects.

SETC of surface/ recess mounting, vertical type, 415 V, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 100A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCB i.e 100 A 4-pole MCB-1 No, 63 A DP MCB- 1 No, 32 A SP MCB- 2 Nos, 16 A SP MCB- 1 No, 10 A SP MCB - 1 No as required.

SETC of 12.5 mtr. long High mast tower made of Mild steel suitable for wind velocity of 50 m/sec. as per IS:875 Part-3 1987 (latest version) consisting of High mast lighting Pole along with head frame, 200W LED flood light luminaries - 4 nos. High mast tower should be installed on suitable size RCC foundation considering the safe soil bearing capacity, foundation bolt of special steel with nuts, washers, anchor plates, templates High mast tower shall also include LT panel with MCB's, timer switch as required. (1 No each in OHE depot & TSS).

3.11.1.6 Provision of Pump at Stations.

The Scope of work shall include but not be limited to design, supply, erection, testing and commissioning of SETC of MCCB 100 Amp 4-pole 25



KA breaking capacity, 80-100% adjustable setting with enclosure complete in all respects.

EARTHING –

- All the non-current carrying metal parts of electrical installation shall be earthed as per IS: 3043. All equipment, metal conduits, rising main, cable armour, switch gear, distribution boards, meters, all other metal parts forming part of the work shall be bonded together and connected by two separate and distinct conductors to earth electrodes. Earthing shall be in conformity with the provisions of Rules 32, 61, 62, 67 and 68 of IER 1956.
- G.I. pipe shall be of medium class, 40 mm dia. and 4.5 m length. Galvanizing shall conform to relevant Indian Standards. The electrode shall be as far as practicable embedded below permanent moisture level. The electrode shall be made of one piece. The earth station shall also be provided with a suitable permanent identification label tag. The earth electrode shall conform to IS: 3043 latest edition. The soil around the earthing electrode shall be treated to reduce the resistivity of the soil by filling the complete depth of electrode with alternative layers of charcoal and salt. The earthing should be as per Drg No. DyCEE(Con)/Gorakhpur/Standard/5/0498.
- The connectivity of metal parts of electrical installation to earth electrodes should be through GI wire/GI strip of suitable size as per direction of Railway authority.
- Earth resistivity test will be done by contractor to establish correct values and use the same for calculating overall earth resistance.

SETC of bore well type 12.5/15HP 3-phase BEE 5-Star rated Submersible Pump having delivery head 25-30 meter, discharge range 30-50 LPS, RPM -2900, Make - Kirloskar/CRI/ KSB along with panel suitable for 415 V, 3-Phase Star delta starter, automatic water level controller, voltmeter, ammeter, protection against single phasing, dry run with required accessories complete in all respect. (One set to be installed at Madhubani one set should be handed over to Railway)

SETC of 100 mm dia of G.I. column pipe Heavy gauge (C-class) conforming IS:1239 Part-1(2004).

SETC of suitable size Pre holed M.S/G.I Flanges to 100/80 mm GI/SS column pipe complete with all accessories.

SETC of stainless steel metallic Sluice Valve suitable for 100/80 mm pipe complete with all accessories.

SETC of metallic Reflex Valve (NRV) suitable for 100/80 mm pipe complete with all accessories.

SETC of Long Pipe Bend suitable for 100/80 mm pipe complete with all accessories.

SETC of Steel Rope of suitable size for submersible Pumps complete with all accessories.



SETC of 3-core, 6.0 sq mm, copper conductor, 1100 volts, PVC Insulated & PVC Sheathed Flat submersible Cable conforming to IS:694 (latest)

SETC of 3-core, 2.5 sq mm, copper conductor, 1100 volts, PVC Insulated & PVC Sheathed Flat submersible Cable conforming to IS:694 (latest)

SETC of UPVC 1.5 inch dia column pipe coupler type and pressure carrying capacity of 15kg/cm.sq with red colour strip, each pipe of 3 mtrs length with bend, flange for submersible bore well pump and having warranty period upto 30 months from the date of supply.

SETC of 50 mm size stainless steel high pressure relief valve complete with all accessories.

3.11.1.7 Deleted

3.11.1.8 Electrification of Staff quarters (Type-II & III)

The Scope of work shall include but not be limited to design, supply, erection, testing and commissioning of The wiring of staff quarters should be done as per scale of fittings issued by Railway Board vide L/No. 2024/I & Trans Cell/SOCC dated 21.06.2024

Wiring of light point, fan point, 5A plug point, 15A power point by suitable size FRLS PVC insulated multi stranded copper conductor wires 1100 volt grade confirming to IS:694 (Latest version) laid through Recessed/surface PVC conduit pipe as required including connection. Earth wire shall also be insulated and of the same cross-sectional area as phase wire. Color Code shall

be maintained for the entire wiring i.e., Red, Blue & Yellow for phase wires, black for neutral & green for earth wire.

The wiring should be through PVC conduit or perforated cable tray and switch, sockets should be modular type confirming to IS:3854/1997 (Latest version)/flush type socket outlet as per IS:1293-1988 (Latest version) complete with GI box, modular base & cover plate.

SETC of door call bell suitable for single phase 230V AC

EARTHING –

- All the non-current carrying metal parts of electrical installation shall be earthed as per IS: 3043. All equipment, metal conduits, rising main, cable armour, switch gear, distribution boards, meters, all other metal parts forming part of the work shall be bonded together and connected by two separate and distinct conductors to earth electrodes. Earthing shall be in conformity with the provisions of Rules 32, 61, 62, 67 and 68 of IER 1956.



- G.I. pipe shall be of medium class, 40 mm dia. and 4.5 m length. Galvanizing shall conform to relevant Indian Standards. The electrode shall be as far as practicable embedded below permanent moisture level. The electrode shall be made of one piece. The earth station shall also be provided with a suitable permanent identification label tag. The earth electrode shall conform to IS: 3043 latest edition. The soil around the earthing electrode shall be treated to reduce the resistivity of the soil by filling the complete depth of electrode with alternative layers of charcoal and salt. The earthing should be as per Drg No. **Dy. CEE (Con)/Gorakhpur/Standard/5/0498**.
- The connectivity of metal parts of electrical installation to earth electrodes should be through GI wire/GI strip of suitable size as per direction of Railway authority.
- Earth resistivity test will be done by contractor to establish correct values and use the same for calculating overall earth resistance.

SETC of modular board with 25 Amp MCB- 1 no, modular socket-32 A - 1 no conforming to IS:8828-1996 & IS:13032/1991 including drilling holes on the wall/board, its connection, earthing complete in all respect for AC point.

SETC of 1200/1400 mm sweep, 5 star rated BLDC ceiling fan as per IS:374/2019 or latest in White Colour with 3 blade, speed control compatible to electronic regulator, input power 28W, brushless DC motor, Blade material aluminium, double ball bearing, 5 year warranty with 300 mm down rod complete in all respect. BLDC fan should be as per PCEE/NER specification no. Elect/Store/Policy/Part-III/546 dated 10.08.2023.

SETC of Exhaust fan plastic body 300mm with louver shutter indoor type window/wall mounted as per IS: 2312 suitable for 230 Volt AC.

SETC of 18-20 watt LED tube light fitting with 5-year warranty complete in all respects as per PCEE/NER specification no. CEE/LED Tube Light 18-20 watt/01/2018.

Supply & laying of XLPE insulated PVC sheathed LT cable 1100 volt grade upto 4 core of sizes upto 240 sq.mm direct laid in ground or through GI/HDPE pipe at a depth of 1M including excavation, sand cushioning, protective brick covering as per IS 1255/1983 (Latest version) and stone made Cable route marker complete in all respect. The cable end should be provided with suitable size cable end boxes and aluminium socket lug terminal.

Supply & making of Pucca cable trench (size 75 cm depth x 65 cm. wide) & its MS sheet cover to carry out the laying of LT cable of different sizes with the support of MS angle of size 25x25x3mm at 50 cm distance for cable protection. Also, cutting of CC work of wall & covering/ plastering of cutted CC work on wall by cement & sand mortar after laying of cable/wiring or for making new cable trench work complete in all respects.



Spare cable to be provided in the same trench with suitable separation by brick between the two cables. The cable route plan should be approved by competent authority.

Supply and erection of GI Pipe 50 mm dia medium gauge conforming IS:1239 Part-1 (2004) or latest for cable support and protection with suitable clamps on pole/wall/FOB/Shelter conforming to IS:1239 complete in all respects.

Supply & fabrication of meter cum distribution box as per drawing approved by railway with 1.2mm thick CRCA sheet in two compartments, one for meter and other for DB with MCB's duly painted approx. size 400x400x150 mm deep IP-55 range single door suitable for operation on single phase 230 V AC supply system. The DB should be supplied with with 2 pole Isolator 63A - 1No. & MCB SP 20A - 4 Nos. with ELCB including drilling holes on the box and its connection recessing, earthing, testing & commissioning as per technical specification and box shall comprise single phase 10/20A. KWH meter with 6mm thick bakelite sheet on base and interconnection with single core PVC insulated copper conductor cable 6.0 sq.mm.

The Make/Brand of Electrical Materials/appliances to be used in Various Electrical works under the scope of this EPC shall be as per the below given table.

List of Branded Material for Electrical:

S. N.	Name of Product / Material	Name of Brand / Make
1	LED (Bulb, Tubelight, Panel light, Street light & Flood light)	Philips, Syska, Havells, Bajaj, Crompton
2	PVC Copper Wire	Polycab, Finolex, Havells, RR Kabel, Anchor
3	LT Aluminium Cable	Polycab, KEI, Universal, Finolex, Apar
4	FRLS Wire	RR Kabel, Polycab, Havells, Anchor, Finolex
5	GI Conduit Pipe	Tata, Jindal, ISGEC, Zenith, Surya
6	PVC Conduit Pipe	AKG, Precision, BEC, Supreme, Prince
7	Electrical accessories for wiring	Anchor, SSK (Top Line), Legrand, Indo Asian, Havells
8	Electrical accessories for wiring (Modular switches & sockets)	Anchor, Schneider, Indo Asian, Havells, L&T
9	MCB / MCCB	L&T, Schneider, ABB, Siemens, Anchor
10	RCCB / ELCB	L&T, Schneider, ABB, Siemens, Legrand
11	Distribution Board	L&T, Schneider, Legrand,



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S. N.	Name of Product / Material	Name of Brand / Make
		Havells, ABB
12	Call Bell / Bell Buzzer	Anchor, Cona SSK, Indo Asian, V Guard
13	Ceiling Fan	Crompton, Havells, Bajaj, Usha, Orient
14	Exhaust Fan	Havells, Crompton, Bajaj, Usha, Orient
15	Wall Fan	Bajaj, Usha, Havells, Crompton, Orient
16	Electronic Regulator	Anchor, Usha, Havells, Crompton, Orient
17	AC Unit (Split, Window & Tower)	Voltas, Blue Star, LG, O'General, Samsung
18	Fresh Air Fan with Fiber Body	Bajaj, Usha, Havells, Crompton, Symphony
19	Water Cooler	Voltas, Blue Star, Usha, Lloyd, Kelvinator
20	Geyser	Bajaj, Usha, AO Smith, Voltas, Crompton
21	Distribution Transformer	BHEL, Kirloskar Electric, ABB, Servocon, Crompton Greaves
22	11 KV VCB	ABB, Siemens, Crompton Greaves, L&T, Schneider Electric
23	Capacitor Bank	ABB, CG Power, Siemens, Alind, L&T
24	ACB & ACB Bus Coupler	ABB, Havells, Alind, CG, L&T
25	LT, 11 KV & 33 KV XLPE Cable	Finolex Cable Ltd, Havells Cable, Polycab Cable, Universal Cable, KEI
26	HT & LT Protection Relay	L&T, ABB, Siemens, Schneider, CG
27	Cable Jointing Kit 11 KV & 33 KV	Denson, Compaq, 3M, Raychem RPG Ltd, XICON
28	DG Set	Kirloskar, Cummins, Ashok Leyland, Greaves Cotton, Mahindra Powerol
29	Digital Measuring Instrument	Rishabh, Meco Instrument, Auto Electric, National Instrument, GE Digital
30	Fuse Switch Unit	L&T, ABB, Siemens, Schneider, HPL



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S. N.	Name of Product / Material	Name of Brand / Make
31	CT & PT	Havells, Siemens, C&S, CGL, MECO
32	High Mast Lighting Tower	Tata, Bajaj, Utkarsh, Philips, CG
33	GI Pipe	Tata, Jindal, Utkarsh, Surya
34	Porcelain Insulator	BHEL, Bengal Industries, WS Insulator, Jaya Shree Insulator, Venkateshwara Ceramic
35	Battery Charger	Usha Electric, Automatic Electric, Trinity Electric, Universal Electric Product, Equipment Control
36	Submersible Pump	KSB, Crompton, CRI Pump, Kirloskar
37	Control Panel for Submersible Pump	KSB, Crompton, CRI Pump, Kirloskar
38	Power Contactors	ABB, Havells, BCH, GE, L&T
39	Earthing Electrode	AKG, Tata, Jindal, Graphite, OBO
40	Lightning Arrester	OBO, LPI, Axis, ERICO, Apollo
41	Danger Board / Signage	National, Jainson, AKG, Safety Plus, Electra
42	Insulating Mat	Electrical India, L&T, Jyoti, National, AKG
43	Electric Pole	Jindal Saw, Tata Steel, Surya Roshni, Utkarsh, Zenith Steel
44	DWC & HDPE Pipe	Finolex Pipe Ltd, Astral Pipes & Polymer Ltd, Supreme Industries, Prince Pipe, Kisan Moulding Ltd
45	LT & HT Panel	L&T, Schneider, ABB, Siemens, CG
46	CLS Panel	L&T, Schneider, ABB, Eastland Switchgear, Supreme

Note: Above make has been indicated based on approved list with letter no- W/CON/98/New Material/W-I(Loose-1) dated 22.01.2026.

3.12 Modification of HT power lines and crossings (raising of height)- NIL



3.13 Modification of HT power lines and crossings (replacement by UG cabling)- NIL

3.14 Modification of LT power lines and crossings (replacement by UG cabling)- NIL

3.15 Extension of LT power supply for CLS Work:

The Scope of work shall include but not be limited to laying of below mentioned capacity cables (main + spare) at 1 meter below ground level covered by HDPE pipe of size not less than 75 mm inner dia (separate for main & spare cables) and 1.5 meter below rail level for under-ground track crossing covered by HDPE pipe of size not less than 160 mm inner dia with cable route markers at every 5 meters, covering exposed/ out of ground part of cable with 50 mm dia B class GI pipe, wiring at station area, earthing station, installation and commissioning of appropriate CLS panel of requisite capacity and extending AT supply to S&T installations & emergency services as per Rly. Bd./ACTM/RDSO guidelines and all necessary documentation for EIG sanction and PCEE/ CRS Inspection, supply of drawings, complete assistance till successful statutory inspection of the installations including handing over of all assets, supervision of maintenance with breakdown attending and all other works provisioned in EPC agreement for following details.

S.N.	Location	Current capacity/ size of conductor	Quantity	Remarks
1	Chhitauni	2 core 70 sqmm	2 Nos.	
2	Jataha	2 core 70 sqmm	2 Nos.	
3	Madhubani	2 core 150 sqmm	2 Nos.	

Supply, erection, testing & commissioning of 10 KVA Change over panel as per RDSO specification No. TI/SPC/PSI/CLS/0020(12/02) (with A&C slip No. 1 to 4) & TI/ SPC/PSI/ CLS/ 0023 with A&C slip 1 to 3 or latest and suitable for 10 KVA AT Supply.

- All material of relay, fittings, Glands, fasteners, Lugs for commissioning of panel and smooth working.
- 8 SWG GI wire of required length with termination connectors for earthing connection to earth electrode.
- Separate Earth station with required length of earth electrode as per standard drawing to be constructed.
- The CLS panel pre-checked by the site Rly Engineer before erection. All tools & testing kit shall be provided by the contractor for conducting the required tests as per Railway norms. The CLS panel shall be fixed at the site as specified by the Railway Site Engineer with proper fittings 2x70 sqmm LT power cable (Main + Spare) from Auxiliary Transformer stations to CLS panel at SM office/tunnel gunti, underground for supply of 230/240V power



supply of CLS Panel.

Supply, erection, testing & commissioning of auto change over panel 150 Amp. capacity as per RDSO spec. No. TI/SPC/PSI/CLS/0020(12/02) (with A&C slip No. 1 to 4) & TI/ SPC/ PSI/ CLS/ 0023 with A&C slip 1 to 3 or latest and suitable for 25 KVA AT Supply.

- All material of relay, fittings, Glands, fasteners, Lugs for commissioning of panel and smooth working.
- 8 SWG GI wire of required length with termination connectors for earthing connection to earth electrode.
- Separate Earth station with required length of earth electrode as per standard drawing to be constructed.
- The CLS panel pre-checked by the site Rly Engineer before erection. All tools & testing kit shall be provided by the contractor for conducting the required tests as per Rly. norms. The CLS panel shall be fixed at the site as specified by the Rly. Site Engineer with proper fittings 2x150 sqmm LT power cable (Main + Spare) from Auxiliary Transformer stations to CLS panel at SM office/tunnel gumti, underground for supply of 230/240V power supply of CLS Panel. Excavation of trench in soil 100 cm deep and 50 cm wide in all kinds of soil for laying of HDPE/spun concrete pipe for underground cable.
- Laying of HDPE/spun concrete pipe and re-filling of soil after completion of laying cable inside pipe. Work should be at par the satisfaction of the representative of Railway at site. Drilling of Horizontal bore by pushing method (trenchless technology) in all types of soil / rock below Railway track/road for laying of GI/CI/Spun/HDPE/DWC pipe of dia. up to 450 mm by pushing method in presence of Railway representative taking all necessary safety precautions related to track and movement of trains.
- Horizontal boring will be done at minimum 1.5 mtr below from ground level at railway track portion or road area. But in case, where bank is high then boring should be such that outer side and under track RCC/HDPE/DWC pipes are in same alignment.
- All work will be done in presence of Railway representative without disturbing the Railway track taking all necessary safety precautions related track and movement of trains. Complete work will be carried out as per instruction & satisfaction of representative of Railway at site. Laying of HDPE pipe in already excavated trench under road/ground/floor/railway track as per site requirement size 75/80mm Dia wall thickness 3mm PN-4 conforming to IS 4984:1995 or latest as per site requirement.
- After laying of HDPE pipe, the trench should be refilled with same soil and restored to original position & pipe should be laid in trench such that possible to withdraw the cable for repair or replacement.



- The pipe shall be laid with a gradient to facilitate drainage of water and it shall be right angle to the track, for each power crossing, contractor shall have to lay two length of pipe, for 02 Nos. of cable to be laid or as per instruction of site engineer.
- Accessories related with laying of HDPE pipe like fitting, bends joints/coupler, junction, flange end cap as per site requirement will be provided by contractor and no extra payment will be given for above items.
- The contractor shall arrange inspection of HDPE pipe at manufacture's works before dispatch at his own cost if required by the railway and have to submit manufacture's test certificate at HDPE pipe.
- Laying of HDPE pipe in already excavated trench under road/ground/floor/railway track with technical specification 160 mm dia (OD), wall thickness between 6.2mm to 7.1 mm, material grade PE-80 and class of pipe should be PN-4 with confirming to IS: 4984/1995 of latest. After laying of HDPE pipe, the trench should be refilled with same soil and restored to original position & pipe should be laid in trench such that possible to withdraw the cable for repair or replacement.
 - The pipe shall be laid with a gradient to facilitate drainage of water and it shall be right angle to the track, for each power crossing, contractor shall have to lay two length of pipe, for 02 Nos. of cable to be laid or as per instruction of site engineer.
 - Accessories related with laying of HDPE pipe like fitting, bends joints/coupler, junction, flange end cap as per site requirement will be provided by contractor and no extra payment will be given for above items.
 - The contractor shall arrange inspection of HDPE pipe at manufacture's works before dispatch at his own cost if required by the railway and have to submit manufacture's test certificate at HDPE pipe.

3.16 Extension/Augmentation of electrical power supply arrangements and associated works - NIL

3.17 Modifications of existing electrical works

3.17.1 List modifications to existing switching posts, if any.- NIL

3.17.2 List modifications to existing OHE, including dismantling of OHE, removal of brackets, cutting of masts, dismantling and removal of existing auxiliary transformer- NIL

3.17.3 List modifications to existing traction substation, such as augmentation of bay, addition or replacement of traction transformer, circuit breakers- NIL

3.18 Inventory electrical - NIL



3.19 Signalling system (for electrification works) As per laid down procedure and included in S&T Works- NIL

- 3.19.1 Modification to existing PI/RRRI/EI systems and modification in signalling system of LC gates- NIL
- 3.19.2 Commissioning of new Electronic Interlocking/Panel Interlocking/ Route Relay Interlocking- NIL
- 3.19.3 Diversion of utilities like cables, location boxes and huts and lifting barriers wherever necessary shall be done prior to taking up of any work in the vicinity of existing Signalling and Telecom systems.

3.20 Telecommunication (for electrification works) As per laid down procedure and included in S&T Works.

All other associated materials and works for completion not limited to items in the above table as required for execution of the signalling and telecom works to suit 25 kV has to be provided by the Contractor.

3.21 Civil works (for electrification works)

- 3.21.1 **General**- Included in Civil Engineering works.
- 3.21.2 **Staff quarter**- Included in Civil Engineering works.
- 3.21.3 **Tower wagon shed and siding**- Included in Civil Engineering works:
- 3.21.4 **Service buildings**- Included in Civil Engineering works: -
 - a). OHE cum PSI Depot.
 - b). Control Room Building for SSP
- 3.21.5 **Other works**

Provide details of other works (sample list below)

- (a) Service roads for switching posts included in civil engineering works
- (b) Fencing wall and Parking Shed – at OHE cum PSI depot included in Civil Engineering works.



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. The Contractor shall provide and maintain these project facilities through out the course of the work and for such period of time during defect liability period, as the Authority's Engineer may require, free of cost. Such Project Facilities shall include:

Civil works, signalling and telecom, Electrical Works

- a) Main Site office & related facilities for PMS/Authority Engineer
- b) Furniture & Office Equipment
- c) Maintenance of Main Site office
- d) Transport Facilities
- e) Services such as water supply, electrification, sanitation, communications
- f) Survey equipment
- g) Contractor's personnel.
- h) Temporary works/ Temporary Facilities for Contractor's use / Contractors office / Camp / Contractors labor camp
- i) Providing electricity to the various project facilities
- j) Project network with project monitoring software like MS project along with closed user telecom group, fax & e-mail facilities and mobile communication network for project monitoring.
- k) Provision of separate Store for OHE & PSI with all related tools and plants like Insulator testing machine, Dropper & bracket fabrication facility, lab for material testing should be done.
- l) Provision of office room in OHE cum PSI store should be done for store incharge as well as for PMC/Railway official. Contractor shall arrange sufficient space for OHE store by taking it on lease/hire basis at suitable location.



2 Description of Project Facilities

Each of the Project Facilities is described below:

S. N.	Project Facility	Location	Design Requirements	Other essential details
1	Main Site Office	-	200 sqm	Details are mentioned in clause 2.1, 2.2, 2.3 and clause 3.0 given below.

2.1 Main Site Office

- 2.1.1 Accommodation for the Authority's Engineer shall consist of one site office with plinth area of 200 sq.mtr to be constructed/hired by the Contractor at Paniahwa, within Three months from the date of commencement of the works. In case of delay beyond three months in provision of the accommodation either through construction or hire, penalty @Rs 20000/- Per week per site office or part thereof will be imposed."
- 2.1.2 The site office should remain open for 24 hours a day and 7 days a week i.e. round the clock till the defect liability period is over.
- 2.1.3 Site Office shall have chambers/rooms for PM, Resident Engineers, Project Director of NER not less than 16 sq.m. work stations for other PMC personnel, Conference Room, pantry and kitchen area, toilets for the proper functioning of the site office.
- 2.1.4 Materials used for the construction of the offices shall be new and of good quality. Materials shall be chosen such that the buildings when erected shall give good ventilation, heat and sound insulation.
- 2.1.5 All buildings shall be supplied with continuous (24 hour) running potable cold water to the kitchens and washrooms. The toilets may use raw water for flushing. The Contractor shall also arrange for the constant and hygienic disposal of all effluent, sewage and rubbish from the buildings.
- 2.1.6 All buildings shall be supplied with electricity, AC 240 Voltage 50 C/S that shall be distributed to each room in accordance with the Regulations. Lighting and electrical power points shall be provided in each room. The disposition and location of light and power points will be as directed by the Authority's Engineer. 24 hours power supply is to be arranged by contractor to meet full power load. Site office will be fully air-conditioned by providing with Air Conditioners of appropriate capacity.
- 2.1.7 Fire fighting equipment shall be provided in accordance with the local recommendations.



2.2 Requirements

The Contractor shall design, construct, equip and furnish the site office for the Authority's and Authority Engineer's use at the time specified below. The Contractor shall also maintain the site office and the huts in good conditions and provide services including, but not limited to maintenance of the office equipment and furniture, repairing and mending, cleaning, consumable replenishment in respect of toiletries, cartridges for the plotter and colour laser writers, first aid box, batteries / battery cells, drinking water.

Design of all the Site Offices and Huts shall be submitted to the Authority's Engineer for review prior to commencement of the construction of those facilities. Details of the Authority Engineer's site office including a provisional site office and huts are described in the following paragraphs.

All furniture, furnishing, fittings and fixtures and equipment shall be of the configuration, make and quality as consented by the Authority's Engineer.

Unless otherwise stated herein below, all the site office including all furniture, furnishings, fittings & fixture and equipment as provided by the Contractor for the use of Authority's Engineer/Authority shall be the property of the Authority after issue of Taking-over Certificate.

Within 90 days after the Appointed Date, unless otherwise authorized by the Authority's Engineer, the Authority Engineer's Main Site Office shall be constructed in the same station as the Contractor constructs his main office and fully furnished as described in the following clauses, and maintained in good conditions until the issue of Taking-Over Certificate unless otherwise authorized by the Authority's Engineer.

2.3 Authority Engineer's Main Site Office

1. The area surrounding the office shall be well Drained and provided with concrete pavements, walkways, and parking areas for the Vehicles.
2. The Authority Engineer's Main Site Office building shall be of sound design and of the material as approved by the Authority's Engineer, complying with national building codes. The office shall be weather proof, lined inside with plywood, and painted internally and externally. Floors shall be tiled and floor to ceiling height shall be as consented by the Authority's Engineer. Each room having an internal wall shall have at least one screened window. The office building shall have two external lockable doors with screened storm doors. Electricity supply and receptacles shall be provided in various locations appropriate to the usage of the rooms. Rooms shall be well lighted, appropriate HVAC systems with temperature control and other necessary building services as described in the National Building Code of India.



3. The Authority Engineer's Main Site Office shall be furnished as referred to the following parameters and the design shall be submitted to the Authority Engineer for review. Within the total area necessary modification can be made with the approval of Engineer.

S.N.	Room No. & Designation	No. of Rooms	Min. Area (m ²)	Min. Tot. Area(m ²)
1	Project Manager Office (PM, Secretary & Engineer)	1	20	20
2	Dep. Project Manager(Dy.PM & Secretary)	1	20	20
3	Senior Engineers/ Jr. Engineers/Surveyors	1	40	40
4	Conference Room-1	1	30	30
5	Administrative Office	1	14	14
6	Rest Room	2	18	18
7	Filling room	1	7	7
8	Store	1	7	7
9	Kitchenette	1	8.5	8.5
10	Washrooms	3	3.5	3.5
11	Printing room	1	7	7
	Total area(Minimum)			200

4. Plumbing fixtures shall be standard types made out of porcelain or stainless steel and all pipe work and fittings shall be poly vinyl chloride (PVC). All works, materials and fixtures shall comply with the national plumbing code, sanitary engineering standards, and other applicable regulations.
5. The equipment and furniture to be provided are listed in Table below and shall be of make/ brand, model, type, size, capacity as approved by the Authority's Engineer / Authority.

3.0 Furniture and Other Office Equipment in main site office

- 3.1 Furniture in main site office: The Contractor shall supply and maintain the following new furniture and equipment to the Authority's Engineer's offices within seven days of the date of commissioning of site office until the Defect Liability Period is over.

S.N.	Description	Nos.
1	Conference table (at least 4000 mm x 1500mm)	1
2	Conference chairs	8
3	Glass-fronted lockable bookcase	3
4	1800mm x 1200mm double pedestal desk	1
5	1200mm x 900mm single pedestal desks	4
6	Swivel office chair with armrests	6



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S.N.	Description	Nos.
7	Swivel office chair without armrests	2
8	Typist chair	2
9	Visitors chair	10
10	4-drawer filing cabinet	2
11	Plan chest (A 0 size)	1
12	1500mm x 900mm tables	10
13	Steel lockable cupboard 6ft high with internal Shelves	3
14	Computer table with Revolving Chair	4
15	Sofa Set	1
16	Plane rack with holders	As one thinks fit
17	Drawing Hangers	As one thinks fit
18	Drawing Cabinets	2
19	Waste paper can	15
20	Display Boards(Wall Type)	2
21	Fully automatics camera with date and time recording facility loadable to a PC	1
22	Multi-Functional Movie projector(with screen)	1
23	Refrigerator	1
24	Crockery/Cutlery Set	5 settings
25	Rain coats(various sizes)	5
26	Pair Safety boots(various sizes)	10
27	Flashlight with batteries	5
28	Wall clock	2
29	Lockers	7
30	Tele-facsimile transmission/reception facility connected to a dedicated line with STD facility	1 set
31	First aid kits for up to 36 persons	2
32	Safety helmets	15
33	Safety harness	15
34	Day-glow waistcoat	10
35	Pairs industrial safety goggles	6 pair
36	2 L kettles	2
37	Potable water dispenser with hot/cold Taps	1
38	Cups and plates	10
39	Fire extinguisher	(As required conforming to the stipulations of Local authorities).



3.2 Equipment in the main site office.

The Contractor shall provide at his own cost new equipment and software as listed below and maintain them for the exclusive use of the Authority and the Authority's Engineer. The Contractor shall provide and maintain the following equipment for the use of the Authority's Engineer and the Authority within one month from the date of commencement of the works until the defect liability period is over. On completion of defect liability period, the equipment shall be property of the Contractor.

S.N.	Requirement Description	Specification
A	Desktop Computer 06 Nos.	With minimum specification of AMD Ryzen 7 5800H/Speed 3.2 GHz (Base) – 4.4 GHz (Max)/8core/16 Threads/4MB L2 /16MB L3 Cache, 16 GB DDR4-3200 RAM, 1TB SSD Hard Disk Drive, DVD writer, 21”colour LED monitor, Operating system- Latest Operating System preloaded with media and documentation and certificate of authenticity and Microsoft Security Essentials preloaded antivirus software.
B	Printers- 05 nos. (A4 size-04 nos., A3 size-01 nos.)	The A4 size printer shall be all-in-one Colour tank printer having features of Fax, Scanner and Printer, A3 size printer shall be Colour tank printer with a print speed of upto 8 pages at 800 dpi or more.
C	Large Format Plotter -1 no.	HP Model c6084A(3800CP 54 colour tank plotter,) or similar with latest specification.
D	Application Software to be installed on each Desktop Computer	1) Microsoft Office latest release. 2) AutoCAD 3D Latest Version 3) MS Project/Sure Track 4) PDF Converter/Professional
E	Colour Scanner	2 nos. A3 size
F	Xerox Machine- 1 nos.	For paper prints capable of reduction and copying A3 & A4 size paper with Automatic document feeder capability and sorter (Canon IR 2020 or similar/better)
G	UPS system	5 nos, With sufficient power backup (minimum backup of 30 minutes) to meet the sufficient power load in case of power disruption.
H	Surge Protection Devices	One for each computer and printer as given above
I	Power supply for systems	Is to be AC 240 volts, 50 Hz from normal building wiring circuit mains, power regulator, stabilizer or transformer should be supplied by the Contractor for the computer



S.N.	Requirement Description	Specification
		systems such that the systems can function efficiently.
J	Internet	Internet connection with Wifi facility so that multiple devices can be connected for each site office.
K	Required Spares	Ink, Cartridges for PCs, Printer, Photocopier including AMC for the machines to ensure defect free operations
L	RO machine.	1 No.
M	Water Cooler	1 No.

Note: In case of failure to provide the equipment including original software & internet connectivity within one month, penalty @ Rs 5000/- Per week or part thereof will be imposed.

4.0 Office Maintenance

The contractor is required to maintain the offices throughout the contract period and provide the following, but not limited to:

- i. Pay all electricity charges.
- ii. Reimburse telephone bills for the use of telephone, up to Rs 3000/- per month for each external landline connection.
- iii. Pay all water charges.
- iv. Carry out necessary repairs to office and equipment as and when required.
- v. Day - to - Day cleaning and maintenance and watch & ward
- vi. The contractor shall provide within Two months from the Date of Commencement following personnel in the office as required for Watchmen / Security (3 shifts of 2 men in a shift, till the defect Liability period is over). Note: In case of delay beyond Two-month, penalty @ Rs. 5000/- Per week or part thereof will be imposed.

5.0 Transport

5.1 General

The Contractor shall provide road transport (for the use of the Authority and the Authority's Engineer within one month from the date of commencement of the works).

5.2 Road Transport

- a) The vehicles shall be new and delivered and maintained by the Contractor in good road worthy condition including daily cleaning. The vehicle shall be replaced with a new vehicle after a maximum run of 75000 Km or three years whichever is earlier.



- b) The Contractor shall employ and make available competent drivers fully licensed to operate the vehicles as and when required by the Authority's Engineer. The Contractor shall replace drivers at the request of the Authority's Engineer.
- c) The vehicles shall be licensed and insured for use on the public highway and shall have comprehensive insurance cover for any qualified driver together with any authorized passengers and the carriage of goods or samples.
- d) The Contractor shall provide fuel, oil for running of each vehicle and ensure maintenance in conformity with the vehicle manufacturer's recommendations and all relevant toll and parking charges incurred in connection with the Works. The vehicle shall be provided day and night as required by the Authority's Engineer or his representative.
- e) A suitable replacement shall be provided by the contractor for any vehicle out of service for more than 24 hours. If the contractor at any time fails to provide vehicle(s) or substitute vehicle(s) as specified, an amount of Rs.3500 per day for each vehicle (that the Contractor failed to provide) shall be recovered from the Contractor.

5.3 Number of Vehicles

The Contractor shall provide the following type of vehicles as per requirement indicated by the Authority's Engineer within one month of the date of commencement.

Type	Number of Vehicle (Civil)	Number of Vehicle (Electrical)	Number of Vehicle (S&T)	Total vehicle months
Innova Crysta, Maruti Ertiga, Scorpio or similar	4	1	1	144
Total	4	1	1	144

NOTE: Each Vehicle supplied should ply 3000 Km per month. If the total kilometer exceeds 3000 KM in a month it will be treated as a separate vehicle month until the next 3000 KM is reached in a month's time.

Type of Vehicle shown above is indicative & should be modified as per the requirement and approval of the Authority Engineer.

The vehicle requirement given above is the maximum requirement of the vehicles at a time. However, requirements in a particular period will be intimated by the Authority's Engineer to the contractor on programme basis at least 7 days before the actual date of requirement. The Contractor shall withdraw particular vehicle(s) if the same is not further required by the Authority's Engineer if so directed. In such cases the instructions shall be given in writing 7 days in advance. The requirement during the Defect Liability Period will be quite less than the maximum requirement mentioned above.



In case the Authority Engineer does not avail full quantity of 144 Vehicle months the necessary deduction of Rs. 40,000/- per vehicle per month will be reimbursed by the Contractor from total project cost to the Authority.

The Contractor shall also provide two multi-Utility vehicles of loading capacity one MT for 24 Months with sitting capacity of 4/6 persons, 4 strokes, 4 cylinders engine, factory-built metal body, cargo box type or passenger cabin type or both (with 24 hours availability), including cost of fuel, lubricants, major/minor repairs, salary of driver, toll tax, all other tax complete, operation and maintenance including running up to 2500 km in a month. The vehicle shall run on pucca, kutcha road and along the track. The contractor shall arrange road permits for vehicles for all the States of operation, as per instructions of engineer-incharge and vehicle shall not be more than three years old.

Duration of Transport Requirements

Transport for the Authority’s Engineer shall be provided so as to cover the entire completion period(s) and Defect Liability Period(S). The transport so provided, shall continue to be the property of the Contractor.

6. Survey Equipment

1. The surveying instruments, to be provided for exclusive use of the Authority’s and Authority Engineer's site staff, shall be brand new, of the latest design and manufactured by Wild, Kern, Nikon or other reputable manufacturer as acceptable to the Authority’s Engineer / Authority.
2. The instruments shall include all items necessary for the Authority’s Engineer to be able to establish horizontal and vertical control both on the surface and underground and to check the Contractor's surveying work.
3. The Contractor shall present to the Authority’s Engineer for consent the proposed make, type, and models with parts and performance catalogues and manufacturer's warranty, prior to purchase.

Following equipment shall be provided:

- a. 4 No. Levels type Wild No.2 or similar, (2 No. with parallel plate attachments) complete with tripods, plumbing rods and staves (including 2 sets of precise staves).
- b. 2 No. Total-stations (SOKKIA or similar, with 1 second precision, complete with tripods and accessories
- c. 4 sets Sighting targets, illuminated for night use, complete with batteries.
- d. 4 No. each Steel tapes of 30m and 60 m each , with spring gauges
- e. 35 No. Metric steel tapes 3m, retractable
- f. 2 No. Optical plumbs



4. The Contractor shall furnish the survey equipment within 60 days after the Appointed Date and maintain it in good conditions until the issue Over Certificate unless otherwise authorized by the Authority’s Engineer.
 5. All the survey instruments shall be maintained by the Contractor through service agents and shall be regularly checked and calibrated.
 6. The Contractor shall provide the Authority’s Engineer with any additional surveying equipment and materials such as pegs, mallets, stakes, nails, paint as required, and shall make available to the Authority’s Engineer any surveying instrument owned by his surveying department, but not included in the above list of equipment, which may be necessary for checking the Works. Any instrument which has been damaged or been non-operational shall be immediately replaced or repaired by the Contractor. Equivalent replacement shall be provided by the Contractor in such cases including the equipment which is being repaired or serviced.
- 7. Temporary Utility Services for the Use by Authority and Authority’s Engineer**

The following temporary utility services shall be provided by the Contractor for the use by the Authority/Authority’s Engineer until issue of Taking Over Certificate unless otherwise directed by the Authority’s Engineer.

7.1 Electricity and Water Supply

Power and potable water supply systems for the Authority’s and Authority’s Engineer’s site office (Main Site Office) shall be installed and made operational within the specified period of construction as mentioned above in respect of the respective site offices. The Contractor shall maintain and provide continuous and adequate supplies unless otherwise authorized by the Authority’s Engineer.

7.2 Sanitation and Sewerage

- a. Sanitation and Sewerage systems for the Authority’s and Authority’s Engineer’s site offices shall be installed and made operational within the specified period of construction as mentioned above in respect of the respective site offices.
- b. The Contractor shall provide a properly designed and constructed septic tank as consented by the Authority’s Engineer for the disposal of domestic sewage from each building in the Authority Engineer’s site offices / huts.
- c. Each septic tank shall be regularly emptied, maintained and serviced by the Contractor to ensure proper functioning.



7.3 Office Cleaning, Waste and Garbage Disposal

- The Contractor shall provide personnel and perform daily cleaning of all rooms in the Authority's and Authority Engineer's site offices and huts.
- The Contractor shall collect and dispose of, in a location and manner consented by the Authority's Engineer, all domestic waste and garbage from the Authority's and Authority Engineer's site offices and huts on daily basis. Collection times shall be arranged for the convenience of the Authority and Authority's Engineer.

7.4 Fire Fighting Equipment

Fire fighting equipment shall be provided in all the site offices and site huts of the Authority's Engineer in accordance with the recommendations of the Local Fire Brigade Station.

7.5 Office Security

The service of a full time round the clock office security shall be provided for the site office of the Authority's Engineer. The Contractor will have to provide 05 Chainmen and will also be responsible for the security/safekeeping of the site.

8. Contractor's Personnel

The Contractor is fully responsible for ensuring quality of construction, supervision of the works being executed by him. He has to deploy adequate number of personnel from his side in order to complete the work within the completion period and also to maintain the infrastructure created under this work till defect liability period. Please refer para 3.4 of Article-3. However, the Contractor(s) shall employ following minimum number of Technical personnel during the execution of the allotted work as per table below. This list is indicative and not exhaustive. Additional manpower as required from time to time to be deployed as per progress for ensuring supervision, quality control. Apart from the key personnel mentioned below, the Agency has to engage required number of skilled and un-skilled workers to complete the work within the stipulated time and to meet the targets of the project.

S.No	Title of Position	Nos	Minimum Experience in relevant field (in years)	Minimum Qualification
1	Project Head	1	15	B. Tech (Civil Engg.)
2	PMs for Civil & Bridge, Track, S&T, Electrical	1+1+1+1	10	B.Tech/ diploma in relevant field.



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S.No	Title of Position	Nos	Minimum Experience in relevant field (in years)	Minimum Qualification
3	Safety Consultant	1	10	Science/Engineering Graduate. Refer para 10.2.11 under Article-10
4(a)	Quality Assurance Engineer/Civil	1	10	B.Tech/ diploma in relevant field.
4(b)	Quality Assurance Engineer/S&T	1	10	B.Tech/ diploma in relevant field.
4(c)	Quality Assurance Engineer/Electrical	1	10	B.Tech/ diploma in relevant field.
5(a)	Site Engineer (Civil)	4	5	B.Tech/ diploma in relevant field.
5(b)	Site Engineer (S&T)	1	5	B.Tech/ diploma in relevant field.
5(c)	Site Engineer (Electrical OHE)	2	3/5	3 Yrs for B. Tech & 5 Yrs for Diploma in relevant Field
5(d)	Site Engineer (Electrical PSI)	1	3/5	
5 (e)	Site Engineer (Electrical GS)	1	3/5	
6	Asst. Site Engineer	1	2	Diploma in relevant field.
7	Computer Operator with knowledge of Software like Trimble Tilos or equivalent, AutoCAD, Microsoft Office	2	5	Graduate
8	Design Engineer (civil & track + S&T+ Electrical)	3	2	Diploma/B.Tech in relevant field.

8.2 The Personnel shall be deployed throughout the Contract period during the execution of work. However, the deployment schedule of these Engineers shall be as per the plan submitted by the Contractor and approved by Authority Engineer. Deployment of these personnel will not absolve the Contractor from his responsibility of proper supervision of work.

8.3 Sufficient number of personnel to assist the personnel at S. No.-3,4,5 shall be deployed fulfilling the requirement of Article 11 of the EPC document



- 8.4 In case the Contractor(s) fails to employ the Contractor’s personnel aforesaid above, he shall be liable to pay an amount given below for the default period:
- (i) Rs. 200,000/- per head per month for Sr.No. 1
 - (ii) Rs. 100,000/- per head per month for Sr.No. 2 ,3 & 4
 - (iii) Rs. 50,000/- per head per month for Sr.No. 5 & 6
 - (iv) Rs. 40,000/- per head per month for Sr.No.7 & 8
- 8.5 The Contractor shall submit the copy of Bio-data and Degree/ Diploma certificate of the above technical staff employed by him for the scrutiny by Authority Engineer and the same will be approved by Authority Engineer and shall be available during the currency of work execution for record purpose.
- 8.6 Authority Engineer reserves the right to scrutinise the records of the Contractor to ascertain as to whether the qualified staff has been actually employed by him and is paid for.
- 8.7 The contractor’s technical personnel should work in cohesion with Authority Engineer’s personnel.
- 8.8 The agency shall provide adequate personnel to facilitate the PMS engineers in collecting samples, in conducting various quality control tests, in carrying out survey works, in checking measurements, facilitating site inspections as required.

9. Contractor’s Office Establishment

1. Contractor’s camp:

Detailed drawings at scale 1:500 showing the camp layout, buildings, road recreation areas, all public utilities and drawings at scale 1:50 showing type building construction details with specifications

2. Offices, parking areas, warehouses, storage areas, and medical care services: Drawings and specifications for the establishments and facilities with appropriate details and First Aid Station.
3. Water supply, sewerage, sewage treatment and disposal, power supply and illumination, communication services (basically mobile phones and land phones), firefighting services
- a. Detailed design for industrial and potable water supply to the camps and working areas as well as sewerage systems, sewage treatment and disposal system based upon estimated number of users.
 - b. Detailed layout drawings for electrical installations and distribution system at the Site and Work Areas, showing power sources, voltages, outlets, and routing of power lines



- 1 Temporary construction works including support systems for deep excavations, cofferdam and the support, concrete formworks and its support, temporary bridges and staging and so on.
- 2 Access routes including temporary road works to all locations necessary to be reached in the course of construction in the Site and the Work Areas including public road diversions.
- 3 Equipment pools and mechanical workshops.
- 4 The detailed plan for operation of the Borrow Areas and Quarries as detailed hereinafter including approach roads
- 5 The Stockpile areas as detailed hereinafter including approach roads.
- 6 Concrete batching & mixing plant and crushing plants, including cement storage:

Detailed design and drawings including manufacturer's drawings and foundation drawing with the supporting design calculations prepared by the Contractor for concrete batching & mixing plant and crushing plants in accordance with the requirements of the pertinent provisions of the Specifications.
- 7 Fabrication Yard, Casting Yard including casting bed, lifting, curing and stacking system for pre-cast concrete elements along with the supporting design calculations and drawings.
- 8 Transporting, handling and launching system for the precast concrete elements / steel fabricated elements including design and drawings for launching truss / girder.
- 9 Material testing laboratories Detailed breakdown of all equipment to be used for material testing in field and in laboratories in accordance with the requirements of the pertinent provisions of the Specifications.
- 10 Explosives magazines- their proposed locations and operation plan
- 11 Security and safety arrangements All arrangements shall comply with the relevant provisions.
- 12 Layout and drawings for offices for the Authority's and the Authority Engineer's staff.
- 13 Project Sign boards and diversion boards.
- 14 Barricades and other temporary walls and alike with pertinent design considerations & drawings containing details such as height, material,



colour scheme, Logo, anchoring mechanism complying with the requirements.

10. Temporary Facilities including labor camp and utilities for the Contractor's Use

10.1 Contractor's Site Offices, Warehouses, Material Yards

1. The Contractor shall provide and equip, for his own and his subcontractors' use, main and secondary offices, warehouses, materials stock areas, fuel storage areas and explosives magazines, all of which shall be constructed and furnished for use within 120 days after the Appointed Date and maintained in good conditions until the issue of Taking-Over Certificate.
2. Listed hereunder are the buildings, shops and warehouses expected to be constructed and equipped by the Contractor for his use in the performance of the Work under this Contract, in addition to facilities explicitly specified elsewhere in this Contract:
 - a. Mechanical repair shop
 - b. Electrical repair shop
 - c. Metal work and wood fabrication shop
 - d. Main warehouse and tools & parts store
 - e. Bulk cement silo
 - f. Bagged cement store
 - g. Spare parts store
 - h. Testing facilities & site laboratory
3. The Contractor shall provide adequate camping facilities for the use of his employees / staff and those of his sub-contractors. Camping facilities shall have adequate sanitary facilities including sewage disposal system, medical service, drainage, fire control and all utility services (potable water, power) and shall comply with statutory requirements.
4. Contractor's Employee's Camp can be located at the land available within the ROW wherever available subject to the consent by the Authority's Engineer. If any additional area is required by the Contractor for the purpose, the same shall have to be arranged by the Contractor at his own cost
5. No camp construction shall commence until the Contractor's drawings and specifications have been consented by the Authority's Engineer.
6. Camp facilities shall be provided to meet the requirements of the maximum anticipated work load and labour force. These facilities shall be available and full operational within 120 days after the Appointed Date and maintained in good conditions until the issue of Taking-Over Certificate unless otherwise authorized by the Authority's Engineer.



7. The Contractor's camp shall comply with the applicable laws, Codes and Standards.
8. The Contractor shall be responsible for keeping the camp, and the buildings within it, in good hygienic conditions. The standards and regulations presently in force in India with regard to personnel treatment, sanitary conditions, and fire and accident prevention shall be duly taken into account.

10.2 First Aid Stations

1. The Contractor shall comply with the applicable laws and health standards presently in force in India. In the event of an epidemic breaking out, the Contractor shall carry out and comply with all orders, arrangements or regulations which may be issued by the Government or local authorities.
2. The Contractor shall construct, equip, and maintain the First Aid Station at adequate locations on the Site and at each and every camp.
3. These facilities shall be fully equipped and staffed as per the applicable regulations in force. These facilities shall be available and fully operational within 120 days after the Appointed Date and maintained in good conditions until the issue of Taking-Over Certificate unless otherwise authorized by the Authority's Engineer.
4. Medical services in the First Aid Stations shall be under the direction of a licensed doctor and nurses on the same working hours as the Works throughout the duration of the construction.
5. Standing arrangements shall have to be made with the nearest general hospital for providing treatment in case of emergencies and serious cases. Use of Contractor's First Aid Stations. The Contractor's emergency medical care and first aid services shall be made available, for use by the Authority's and Authority Engineer's site staff and their families living at the Site or the Work Areas, free of charge. The Contractor shall summarize the design of all his Temporary Facilities in the Temporary Works Design Report and Drawings.

10.3 Temporary Utility Services for the Contractor's Use

10.3.1 Power Supply and Illumination

1. The electric power supplies for the Temporary Facilities including but not limited to Contractor's camps, offices, Site, Work Areas and other facilities as described herein shall be arranged by the Contractor at his own cost. If water & Electricity connections are available and provided to the Contractor for Project facilities, they will be charged as per the extant rules of Railways.



2. The Contractor shall install, operate and maintain its own electrical distribution systems for the power supply for his Temporary Facilities including Site, Work Areas.
3. The Contractor shall also furnish, install and keep operational the diesel power generating facilities of such capacity what he considers necessary to prevent the interruption of the Works.
4. The Contractor shall ensure adequate illumination for all his operations at the Site and at the camp. According to National Building Code of India (2005) the minimum intensities for illumination in general shall be as follows:

S.N.	Area of Operation	Luminous Intensity
a.	General construction areas, outdoor concrete placement, active storage areas, loading, platforms, refuelling, and field maintenance areas	20 Lux
b.	Indoor construction areas	150 Lux
c.	General construction plant and shops, e.g. batching plants, mechanical and electrical, equipment rooms, carpentry shops, active storerooms, barracks or Living quarters, lockers or dressing rooms, mess halls, and indoor toilets.	100Lux
d.	First aid stations, infirmaries, and offices	300 Lux
e.	General interiors warehouses, corridors, hallways and exit Ways	100 Lux
f.	Welding	150 Lux

10.3.2 Water Supply

The Contractor shall design, install, operate and maintain water supply systems including pumps, piping system, valves, storage tanks at the Site with respect to:

- a. Industrial water supply system:

For construction use meeting the quality requirements as specified in Specifications

- b. Potable water supply system :

For supply to all the Temporary Facilities including but not limited to Contractor's camps, offices, Site, Work Areas and other facilities for human consumption and use In case the Contractor plans to install bore well for water supply, he shall thoroughly investigate the relevant legislation and regulations imposed by the competent authorities and the installation shall be subject to approval by the said competent authorities and/or consent of the Authority's Engineer. Throughout the duration of the construction, the Contractor shall take samples from all water supplies at regular intervals and test it for its suitability for the intended use.



10.3.3 Sanitation and Sewerage

1. All Sites, offices, workshops, laboratory, camp and other buildings shall be provided with sanitation and sewage handling & disposal system complying with the statutory requirements and applicable laws, Codes & Standards.
2. If required, portable chemical toilets shall be provided and maintained by the Contractor for the use of all personnel at all work locations.

10.3.4 Waste and Garbage Disposal

1. The Site and the Work Areas shall be kept clean and free of refuse at all times.
2. The Contractor shall collect waste material and garbage from Site, camp, office, yards and workshops on a daily basis and dispose off the same in the approved area and as per the guidelines prescribed by the local authorities. No waste of any kind shall be deposited in any watercourses.

10.3.5 Fencing and Site Security and Safety

1. The Contractor shall be responsible for the security and safety of site. Accordingly, the contractor's offices, workshops, and storage compounds, camp sites, all construction areas, storage areas shall be adequately fenced, gated, lighted and guarded round the clock. Firefighting equipment shall be provided in accordance with the applicable Codes and requirements of local authorities.
2. The explosive magazines comply with the relevant regulations of India and shall be at the locations approved by the competent authorities. Detonators and fuse shall be stored in separate magazines away from explosives. In no case they shall be transported in the same vehicles with explosives. Explosive magazines shall be kept locked and keys accounted for at all times.
3. The Contractor shall be responsible for any losses occurring within the Site premises. The Contractor shall install, furnish all these facilities within 120 days after the Appointed Date and maintained in good conditions until the issue of Taking-Over Certificate. Inspection by the Authority or Authority's Engineer The Authority and the Authority's Engineer have the right at any time to inspect any part of the Contractor's Temporary Facilities and to require immediate rectification to comply with the specified requirements.

10.3.6 Final Clean-Up

1. Upon the Completion of Works, or when any of the plants and facilities have completed its functions, the Contractor shall dismantle and demobilize the temporary facilities and remove all refuse, debris, objectionable material, and fill, grade and dress all the areas to its original condition as it was before commencement of the Work.



2. No demobilization or removal of temporary facilities and equipment shall be made without prior consent of the Authority’s Engineer.

10.4 Contractor's Labour Camp

10.4.1 General

1. The Contractor shall comply with all requirements as specified in the local bye laws formulated by the state government.
2. The Authority will not provide living accommodation for the use of the Contractor or any of his staff or labour employed on the Works.
3. The Contractor will have to carry out police verification of all his staff or labour employed on the Works.

10.4.2 Provision of Labour Camp

1. The Contractor, shall, at his own expense, make adequate arrangements for the housing, supply of drinking water and provision of bath rooms, latrines and urinals, with adequate water supply, for his staff and workmen at the location authorized by the Authority.
2. No labour camp shall be allowed at Site without the consent of the Authority or any unauthorized place. The Contractor shall prepare a detailed labour camp plan to obtain the consent from the Authority.
3. The Contractor at his own cost shall maintain all camp sites in a clean and sanitary condition.
4. The Contractor shall obey all health and sanitary rules and regulations, and carryout at his cost all health and sanitary measures that may from time to time be prescribed by the Local/Medical Authorities and permit inspection of all health and sanitary arrangements at all times by the Authority and the staff of the local municipality or other authorities concerned.
5. Should the Contractor fail to provide adequate health and sanitary arrangements, these shall be provided by the Authority and the cost recovered from the Contractor.
6. The Contractor shall at his own cost, provide First Aid Stations within the camp.
7. The Contractor shall at his own cost, provide the following minimum requirements for fire precautions at suitable locations complying with the requirements of applicable codes:
 - a. Portable fire extinguishers.
 - b. Manual Fire Alarms.
 - c. Water Supply for use by the Fire Service.
8. The Contractor at his own cost shall provide necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers.
9. The Contractor shall ensure that electrical installations are done by trained electricians and as per the applicable Codes and Standards and these installations shall be maintained and daily maintenance records shall be made available for inspection of the Authority.



10.4.3 Camp Discipline

1. The Contractor shall take requisite precautions, and use his best endeavours to prevent any riotous or unlawful behaviour by or amongst his workmen, and others, employed directly or through sub-contractors.
2. These precautions shall be for the preservation of the peace and protection of the inhabitants and security property in the neighbourhood of the Works.
3. In the event of the Authority requiring the maintenance of a Special Police Force at or in the vicinity of the site, during the tenure of the work, the expenses thereof shall be borne by the Contractor.
4. The sale of alcoholic drinks or other intoxicating drugs or beverages upon the work, in any labour camp, or in any of the buildings, encampments or tenements owned or occupied by, or within the control of, the Contractor or any of his employees directly or through sub-contractors employed on the work shall be strictly prohibited and the contractor shall ensure strict compliance with this condition.
5. The Contractor shall also ensure that no labour or employees are permitted to work at the site in an intoxicated state or under the influence of drugs.
6. The Contractor shall remove from his camp such labour and their families, who refuse protective inoculation and vaccination when called upon to do so by the Authority on the advice of the Medical Authority.
7. Should Cholera, Plague or any other infectious disease break out, the Contractor shall at his own cost burn the huts, bedding, clothes and other belongings of or used by the infected parties.
8. The Contractor shall promptly erect new accommodation on healthy sites as required by the Authority, within the time specified by the Authority failing which the work shall be done by the Authority and the cost recovered from the Contractor.

10.4.4 Labour Accommodation

1. The Contractor shall provide living accommodation for all staff employed by himself or his subcontractors that is equal to or exceeds the minimum criteria established in the following sub-sections.
2. The buildings shall be constructed so as to have a minimum life of not less than the period of the Contract.
3. The roofs shall be leak proof and laid with suitable non-flammable materials permissible for residential use under local regulations and for which the consent of the Authority has been obtained.
4. Each unit shall have suitable ventilation with all doors, windows and ventilators provided with security leaves and fasteners and back to back units are to be avoided.
5. The minimum height of each unit shall be 2.1 m.
6. The Contractor shall provide a suitable cooking area.
7. The number of common toilet/bath/urinals shall be provided as per camp requirement.



10.4.5 Water Supply

1. The Contractor shall make his own arrangements to provide adequate potable water supply in the Camp.
2. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, storage tanks of metal or other consented material shall be provided.
3. The Contractor shall also at his expense make arrangements for the provision and laying of water pipe lines from the existing mains wherever available.

10.4.6 Drainage

1. The Contractor shall provide efficient arrangements for draining away surface water so as to keep the camp neat and tidy.
2. Surface water shall be drained away from paths and roads and shall not be allowed to accumulate into ditches or ponds where mosquitoes can breed.

10.4.7 Sanitation

1. The Contractor shall make arrangements for conservancy and sanitation in the labour camps according to the rules and regulations of the Local Public Health and Medical Authorities.
2. The Contractor shall provide a sewage disposal system that is adequate for the number of residents in the camp, and which meets the norms of the local authorities.
3. The provision of the latrines and wash places shall be in accordance with applicable Codes and Standards. However, the layout shall be subject to consent by the Authority.
4. The Contractor shall be responsible for maintaining all latrines and wash places on the Site in a clean and sanitary condition and for ensuring that they do not pose a nuisance or a health threat.
5. The Contractor shall also take such steps and make such provisions as may be necessary or directed by the Authority to ensure that vermin, mosquito breeding area at all times controlled.
6. The Contractor shall be responsible for providing water, electricity, communication, sewage disposal arrangements, drainage, roads, paths and parking facilities for all the site accommodations, structures and buildings and meeting all the requirements as specified in the Bid Documents.
7. The Contractor shall also be responsible to obtain the necessary approval from the relevant civic and utility authorities and shall maintain all such services that are necessary for satisfactory performance of the Works.

11. TEMPORARY WORKS

11.1 Scope of Work

1. All necessary Temporary Works adequate for the realization of the Works such as Temporary Facilities and Temporary Utility Services shall be provided and maintained by the Contractor for his own use, for his sub-



- contractors, the Authority’s Engineer and the Authority unless otherwise authorized by the Authority’s Engineer.
2. The Temporary Facilities including, but not limited to, offices, warehouses and material stock areas as well as the Temporary Utility Services including, but not limited to, power, lighting, water and communication shall be provided, equipped, and maintained in good conditions until the issue of Taking-Over Certificate.
 3. The Contractor shall ensure that the Temporary Facilities and Services do not interfere with the Permanent Works or prevent the installation, commissioning and testing of the Permanent Works and works and services of Other Contractors. Where necessary the Contractor shall divert or relocate the temporary facilities / services in the course of the works at his own cost.

11.2 Submittals

11.2.1 Technical Design Submission

The contractor shall submit the Temporary Works Drawings and the Temporary Works Design Report which detail adequate scale, location and all arrangements of the Temporary Works to the Authority’s Engineer for review within 90 days after the Appointed Date except for the items as described in para (4), (7) and (8) herein below, submissions in respect of the same shall be made by the time when the Final Technical Design Submission is made. The Temporary Works to be carried out shall be consistent with the plan submitted by the Contractor with his technical proposal in his Bid together with any subsequent developments and / or changes subsequently agreed to by the Authority / Authority’s Engineer. The Temporary Works shall include but not limited to the following:

A) Land for temporary facilities for Contractor's Use:

Wherever available, the Contractor shall be allowed to use Railway land for carrying out his Temporary Works including stock piling of ballast and other materials but excluding the Borrow Pits and the Quarries subject to the consent by the Authority’s Engineer. Any land required in excess of that shall have to be arranged by the Contractor using his own resources and at his own cost under due intimation to the Authority’s Engineer.

B) Borrow Areas and Quarry:

1. It shall be the responsibility of the Contractor to arrange for the borrow areas (for fill material) and quarry sites (for ballast, aggregates and rock material) using his own resources and at his own cost. The Contractor shall have to carry out his own investigations and verify about their approach, availability, sufficiency, quality and quantity of the material from the sources. The Contractor may also arrange additional borrow areas and quarry sites as required by him and at his own discretion. No claim whatsoever shall be entertained by the Authority in this regard.



2. All the charges whatsoever towards royalties, taxes & duties, cess, cost of temporary land as applicable for arranging the borrow areas and quarry sites including for the material extracted there from shall have to be borne by the Contractor.
3. Before commencing operations in each of the borrow areas and quarry site, the Contractor shall submit a detailed plan of his operations and demobilization/ grading & finishing in respect of the same to the Authority's Engineer for his consent along with relevant drawings. The details shall be submitted as part of Temporary Work Design Report and Temporary Works Drawings.
4. The quality of fill material, ballast and aggregates extracted from borrow areas and quarry sites shall meet the requirements of Specifications and subject to consent of the Authority's Engineer
5. Generally No Borrow areas, quarry sites and installation of rock crushers shall be permitted within the ROW of the Project. However, in case of Railways land is found to be suitable for extracting good soil / boulder for aggregate the same shall be permitted with the approval of Authority after due permission from State Authority. The Financial terms for use of this material shall be
6. On completion of the work, the Contractor shall leave the borrow area site in a safe and stable condition
7. The Contractor shall indemnify the Authority against all claims in relation to the borrow areas and quarry sites during and after the Works are completed.

C) Stockpile Areas:

1. The Land available within the ROW at each Station has been indicated in the respective Station drawings enclosed in the Reference Drawings. The same may also be used by the Contractor for stacking of ballast and other materials, subject to consent of the Authority's Engineer.
2. The Contractor may also arrange additional stockpile areas as required by him at his own discretion and cost.
3. The location and size of the Stockpile Areas proposed by the Contractor shall be subject to consent of the Authority's Engineer. The Authority Engineer's consent may be withheld for any of the following reasons:

If the Stockpile Area, or access into them, in the opinion of the Authority's Engineer:

- a. Will have a detrimental effect on the natural and social environment;
 - b. Will disturb drainage system around the Stockpile Areas;
 - c. Would constitute a danger to the public; or
 - d. Becomes too high stockpile as decided by the Authority's Engineer.
4. Before commencing operations, the Contractor shall submit detail drawings of the proposed Stockpile Areas together with the proposed method of operation including stockpile heights, runoff / dust control



measures, access road layout, drainage and measures to be taken for restoration.

5. On completion of stockpile operations the Contractor shall reinstate the Stockpile Area in a safe and stable condition.
6. The Contractor shall indemnify the Authority against all claims in relation to the Stockpile Areas during and after the Works.
7. All the soil excavated in the ROW shall be the property of the Authority and shall not be removed from the Site without the consent of the Authority's Engineer / Authority and shall be used for the Works to the extent feasible.

D) Automatic Concrete Batching & Mixing Plant and Crushing Plants:

1. The Contractor shall plan, install and erect all necessary automatic concrete batching & mixing plants and crushing plants of sufficient capacity to meet the planned peak requirements during construction. The capacity of the plants shall be subject to consent by the Authority's Engineer. All control and measuring equipment shall be regularly calibrated. The Contractor shall submit the Authority's Engineer the results of the calibration regularly.

E) Material Testing Laboratories:

1. The Contractor shall build and equip adequate Material Testing Laboratories on the Site and / or at the Work Areas for sampling and testing of materials for concrete, earth or any other materials as specified in the Specifications. The location of the Material Testing Laboratories shall be consented by the Authority's Engineer.
2. The laboratory shall be located in a building properly equipped with electricity, water, air-conditioning and shall have enough room for storing the samples.
3. The equipment to be supplied and the methods of testing shall be in accordance with the relevant Indian Standards specified in the Specifications and / or as described in the respective Manual. All apparatus and equipment shall be brand new and of the latest design and manufactured by a reputable manufacturer. The proposed type and number of items of laboratory equipment shall be presented to the Authority's Engineer prior to purchase.
4. The equipment and apparatus shall be calibrated before the testing starts and at regular intervals as specified by the manufacturer and as directed by the Authority's Engineer. The Contractor shall submit the results of the calibration to the Authority's Engineer regularly.
5. The constructor shall complete the construction and installation of the facility for operation within 120 days after the Appointed Date and operate and maintain the facility until the issue of Taking-Over Certificate unless otherwise authorized by the Authority's Engineer. The Contractor shall also make all facilities and services available to the Authority's Engineer as required. All sampling and testing to be undertaken shall be under the direct supervision of the Authority's



Engineer. The Material Testing Laboratory shall be run by Contractor's personnel fully experienced in sampling and testing of materials, and quality control.

6. Specialized testing which may be required and which cannot be performed in the Contractor's laboratory due to lack of time or equipment shall be assigned to an independent organization having NABL Accreditation and duly consented by the Authority's Engineer. The Contractor shall accept all results, instructions or restrictions stipulated by the Authority's Engineer based on such tests.

F) Communication Systems:

The Communication System to be applied to the project shall be basically the Mobile Phone Base Communication System. The Contractor shall establish the Mobile Phone Base Communication System Plan solely dependent on ready-to-use mobile phones for internal and external communication and submit the plan to the Authority's Engineer for consent. The Contractor shall ensure that his Communication System is available for communication with the Authority's Engineer and Authority within 30 days after Appointed Date and shall maintain the same until completion of the Defect Notification Period.

- 11.2.2** The Contractor must ensure uninterrupted supply of electric power for running of each site office by providing stand by power source sufficient for running all the appliances in the office excluding the air conditioner.



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 Railway Project. The time limit for the review and clearances by the Authority for design and drawings submitted by the Contractor shall be as indicated in Annexure-II.

1.1 Contractor's Responsibilities

1.1.1 The Contractor shall take full responsibility for adequacy, stability, safety and security in respect of all the:

- a. Works including the Permanent Works and Temporary Works
- b. Site Operations
- c. Methods of construction, manufacture, transportation, installation including testing and commissioning
- d. Plants and Contractor's Equipment Irrespective of any Notice of No Objection by the Authority's Engineer

1.1.2 The Contractor shall, whenever required by the Authority's Engineer, submit to the Authority's Engineer details of the arrangements and methods which the Contractor proposes to adopt for execution of the Works for his consent. No alteration to these arrangements and methods shall be made without the consent of the Authority's Engineer.

1.1.3 Before starting the Work at Site, it shall be essential on part of the Contractor to ensure that there are no charted and uncharted utilities infringing the Permanent Works particularly the cables carrying the working circuits within the Right of Way (ROW). Diversion of all the charted and uncharted utilities shall be handled as specified.

1.2 Contractor's Organization during Construction Phase

1.2.1 Project Organization Plan

1. The Contractor's Personnel shall be deployed and maintained as per the requirement at site. The Contractor's Superintendence shall be also properly deployed and maintained to carry out the construction activities.
2. The Contractor shall submit an updated Project Organization Plan which includes complete project organization chart during the Construction Phase adding functions and personnel necessary to



perform the Works during the Construction Phase. This plan shall be updated and resubmitted whenever there are changes to the staff and/or the organizational structure. The plan shall show the management structure and state clearly the duties, responsibilities and authority of key staff member.

3. Full details regarding qualification and experience in respect of all the key staff shall be submitted to the Authority's Engineer for his consent, If the Authority's Engineer asks (in writing) the contractor to remove a person of his work force stating the reasons the Contractor shall ensure that the person leaves the Work Area within seven days and shall have no further connection with the Works in the Contract. The Authority's Engineer shall also seek prior consent of the Authority in this regard.
4. During the Construction Phase, the Contractor shall maintain the Design Team in his organization independent of the Construction Team to deal with his design development including the Variation and changes to his design.

1.2.2. Requirements During Construction Phase

1. The principal requirements relating to the Contractor's Documents during the Construction Phase are the submissions by the Contractor of the followings:
 - a. Working Drawings and Documents,
 - b. the technical submissions as required under the Contract,
 - c. the compilation of the multiple design submissions for the different Work Segments and submission of the final design with related documentation and the submission of the As-Built Drawings / Document.
2. Working Drawings and Documents shall be prepared as required under the Contract.
3. The Contractor shall endorse the Working Drawings and Documents as being in accordance with the Technical Drawings which have received "Notice of No Objection" or "Notice of No Objection with Comments" from the Authority's Engineer after the comments duly resolved.
4. The Contractor shall endorse the submissions required under the contract that "all effects of the designs comprising the submission, on the design of adjacent or other parts of the works have been fully taken into account in the design of these parts".
5. The Contractor shall submit the Construction Design and Drawings as specified.



6. The Contractor shall maintain all records necessary for the preparation of the As-Built Drawings and Documents.
7. Upon completion of the Works or at such time as agreed to or required by the Authority’s Engineer, the Contractor shall prepare drawings which, subject to the Authority Engineer's agreement, shall become the As-Built Drawings and Final Documents.
8. All such drawings and documents shall be endorsed by the Contractor as true records of the construction of the Permanent Works and of all Temporary Works that shall remain on the site.
9. The Contractor shall maintain all records necessary for the physical and financial completion and commissioning. These records shall consist of as a minimum:
 - a. The implemented work according to activities, places and price; and
 - b. Used materials - type, name of manufacturer along with batch No., place & price;
 - c. Proof of transportation, bills, invoices.
10. Prior to the commencement of construction operations, the Contractor shall obtain all necessary clearances from the concerned Authorities.
11. Contractor shall take all measures and precautions to ensure that the construction activities do not cause any infringement to the operations and maintenance of Indian Railways. Any construction activity involving the existing embankment/formation of the Indian Railways shall be permitted only with specific authorization by the Authority Engineer/Authority.

1.3. Construction Works

- 1.3.1 Prior to start of the construction operations, the Contractor shall submit all relevant technical details including but not limited to the following for review and evaluating the proposed construction methods and quality control procedures.
 - (a) Geotechnical Investigation Report and evaluation of sub-surface conditions for Permanent Works, Bridges along the alignment.
 - (b) Geotechnical Investigation Report for borrow areas.
 - (c) Material test report for embankment fill, prepared subgrade, blanket material, structural steel, bearings for steel bridge spans, cement, reinforcing steel, water, sand, aggregate for concrete works
 - (d) Slopes stability calculations



- (e) Analysis of stability and settlement of embankments/tunnels and design of remedial measures (if required)
 - (f) Details of construction equipments
 - (g) Construction quality control plan
- 1.3.2 Contractor shall be responsible for reviewing and validating the information provided, taking all necessary measures and precautions of satisfactory completions of the Works meeting the performance requirements in the stipulated time including but not limited to carrying out all the investigations as required, changes in the design, ground treatment or improvement, modification of construction methods required due to site conditions. He shall also be responsible for all the temporary works, dewatering and drainage arrangements.
- 1.3.3 Availability of Embankment Fill Material The Contractor shall procure the materials suitable for sub-grade and embankment fill after carrying out the necessary tests required as per Specifications, and confirming their suitability.
- 1.3.4 Scheme to improve the sub-soil/ground condition of "weak ground" and locations of "BCS" , location wise and design for the same shall be submitted by the contractor. The necessary parameters adopted for design shall be well corroborated with Indian/International codes and/or practices adopted successfully for similar conditions and loadings.
- 1.3.5 Storage / Fabrication Yard for Structural Steel for Steel Bridge Spans The Contractor shall plan, design and construct his fabrication yard & shop assembly yard as consented by the Authority's Engineer and at the location acceptable to the Authority's Engineer. All the facilities provided therein shall be subject to consent of the Authority's Engineer. In respect of structural steel material brought by the Contractor to the storage / fabrication yard for incorporation into the Bridges and Structures, the Contractor shall store such steel material in the proper storage yard and carry out fabrication and shop assembly of such steel material in the proper fabrication yard. Such storage /fabrication yard shall be kept clean and properly drained, as to prevent loss, damage and deterioration, and to ensure the preservation of its quality and fitness for the Works. Contractor needs to submit a Quality Assurance Programme (QAP) for Steel fabrication and Scheme for Erection work before the commencement of the work and has to get it approved from the Authority's Engineer, Authority.
- 1.4 Checking of the Contractor's Temporary Works Design**
 - 1.4.1 The Contractor shall, prior to commencing the construction of the Temporary Works, fully check the design and go through the Internal Authorization Process and submit design to the Authority's Engineer for consent as part of the Technical Design. Through those process and procedures, the Contractor shall ensure that his Temporary Works have been properly and safely



designed and checked the effect of the Temporary Works on the Permanent Works.

- 1.4.2 In addition to the above, the Contractor shall also submit a Design Certificate to the Authority's Engineer, duly signed by Design Director of the Contractor's Design Team and Contractor's Representative as part of Contractor's Internal Authorisation process, certifying that the Temporary Works have been properly and safely designed and checked including the effect of the Temporary Works on the Permanent Works and has found this to be satisfactory.

1.5 Safety Requirements

- 1.5.1 The contractor's site safety plan shall cover the following aspects-

- (a) Statement of contractor's safety policy.
- (b) Senior management responsibility for safety
- (c) Appointment, duties and responsibilities of Site safety staff
- (d) Policy for identifying Hazards
- (e) Safety training
- (f) Safety equipment
- (g) Safety of the Contractor's construction and office equipment
- (h) Safety of the workmen and staff at site
- (i) Safety procedures for sub-contractors
- (j) Disciplinary procedures
- (k) Accident reporting
- (l) First aid and emergencies
- (m) Safety promotion and awareness
- (n) Site security
- (o) Labour safety

- 1.5.2 The Contractor's Site Safety Plan shall also incorporate the requirement of Safety while having interface with the running tracks of Indian Railways and complying with

- (a) Indian Railway's rules and regulations for track, signalling and operations possessions
- (b) operating a system of permit to work for all works which may affect the operations of the existing railway and
- (c) requirements of safety aspects for working near the running tracks of Indian Railways as specified

- 1.5.3 Authority's Engineer reserves the right to order (in writing) the immediate removal and replacement of any of the Contractor's equipment or temporary works which in his opinion is unsatisfactory or not required for the Work for its purpose and / or is in unsafe condition.



- 1.5.4 Contractor shall be fully responsible for safety of the Works and shall treat safety measures as a priority in all his activities through out the execution of the Works.
- 1.5.5 Contractor shall have full regard for the safety of all his personnel, sub-contractor's personnel, the public and all the personnel directly or indirectly associated with the Works on or in the vicinity of the Site and the Work Areas (including without limitation to the persons to whom access to the Site has been allowed by the Contractor), to comply with all relevant safety regulations, including provision of safety gear, and in so far as the Contractor shall be in occupation or otherwise is using areas of the Site and the Work Areas, to keep the Site and the Work Areas (so far as the same are not completed and occupied by the Authority) in an orderly state appropriate to the avoidance of injury to all persons and shall keep the Authority's Engineer/ Authority indemnified against all the injuries to such persons.
- 1.5.6 Contractor shall provide and maintain all lights, guards, fences and warning signs and watchmen when and where necessary or required by the Authority's Engineer or by laws or by any relevant authority for the protection of the Works and for the safety and convenience of the public and all persons on or in the vicinity of the Site and the Work Areas.
- 1.5.7 When the work would otherwise be carried out in darkness, the contractor shall ensure that all parts of site and work areas where the work is being carried out are so lighted as to ensure the safety of all persons on or vicinity of the sites, the work areas and of such work to the satisfaction of the Authority's engineer.
- 1.5.8 Contractor shall be required to take note of all the necessary safety provisions and the Contract Price shall be deemed to be inclusive of all the necessary costs to meet the standards and requirements as prescribed therein. In case the Contractors fails to meet the above requirements, the Authority shall provide the necessary arrangements and recover its costs from any bills due to the Contractor.

1.6 Safety Requirements for Working Near Running Tracks of Indian Railways

1.6.1 Operational Safety

Where the work to be executed is in proximity of the running railway track, the Contractor shall be required to observe all precautions and carry out all works that may be necessary to ensure the safety of the running track/trains without imposition of any speed restriction thereon as may be directed by the Authority's Engineer. No claim whatsoever shall be entertained for either any inconvenience caused to the Contractor or for the re-scheduling of the operations or for any other reasons on this account. The Contractor shall ensure that the materials are not stacked close to the railway track, which may endanger the safety of trains and workmen.



1.6.2 Where the Schedule of Dimensions of Indian Railways for the running tracks of IR are likely to be infringed by the Contractor, the following safety measures shall be ensured;

1.6.2.1 Measures prior to start of the Work:

- (i) contractor shall arrange to provide necessary training to their supervisors and staff including lookout man / flagman For safety requirements as per IRPWM for working near IR tracks. Such training can be arranged at ztc / dtc or any other authorized institute of Indian railways. Authority shall assist the contractor in organizing such training and all the charges for such training shall be borne by the contractor. The contractor shall ensure that the safety norms are followed for working in the premises of IR and in the vicinity of running tracks and electrified territories
- (ii) Inform the Authority's Engineer / Authority about:
 - (a) Name and address of the Contractor's supplier / sub-contractor assigned to execute the work
 - (b) Name of the vehicle drivers / equipment operators identified for the work
 - (c) Location, duration and timings during which the SOD of IR is to be infringed
- (iii) Provide the Authority's Engineer / Authority with
 - (a) copy of detailed planning of work including protection of IR track and safety measures proposed (duly consented by the Authority's Engineer and approved by the Authority)
 - (b) copy of the competency certificate of the Contractor's Supervisor Incharge of the work (to be issued by the Authority's Engineer)
- (iv) Demarcate the working area at site in consultation with the Authority's Engineer / Authority
- (v) Barricade/temporary fencing along the stretch of the concentration of the work area along the IR track, as consented by the Authority's Engineer.
- (vi) Provide adequate watch and ward, flagmen, lighting including signage Boards

1.6.2.2 Measures during execution of Work:

- (i) It shall be ensured that no workmen and staff is working on line /track side unless proper 'Permit to Work' is issued for those lines by the Indian Railways and Authority's Engineer.
- (ii) It shall be ensured that the moving dimensions of IR shall not be infringed. The track crossing work shall not be carried out without permission from the



- Authority’s Engineer and IR. Safety of all the existing fixed structures near the vicinity of the Site shall also be ensured.
- (iii) No vehicles shall be plied within 6m of the centre of the IR track without the specific approval from Authority’s Engineer / Authority. Individual vehicle / construction equipment shall not be left un-attended. No vehicle shall ply from sun- set to sunrise and during the period when the visibility is impaired, except in case of emergency and with the consent of the Authority’s Engineer.
 - (iv) Where the construction vehicles are required to ply along the existing running tracks of IR, the Contractor shall deploy the adequate patrolmen to prevent tendency of the vehicle drivers to come close to the tracks and infringe.
 - (v) All the drivers of the road vehicles / machines plying near the running tracks of IR shall be provided with a red flag / red lamp so that in the event of any obstruction, they shall stop the incoming train.
 - (vi) It shall be ensured that the line of demarcation shall not be infringed by the road vehicles / construction equipment.
 - (vii) It shall be ensured that only eligible and competent staff shall be employed for the work and they must wear identity card while working near running tracks of IR.
 - (viii) For working during night, sufficient illumination shall be provided for the entire work area for safety of the workmen and public.
 - (ix) Temporary Engineering signals as required shall be provided.
 - (x) Existing engineering indicator boards shall be lit as per Permanent Way Manual (IRPWM) of Indian Railways.
 - (xi) Lookout man with red and green flags / hand signals and whistle shall be deployed wherever required.
 - (xii) No part of the stacked material shall infringe the moving dimensions of IR. Material shall be stacked to such a height that it does not lead to infringement of SOD in case of accidental toll off.
 - (xiii) Any temporary arrangement shall not infringe with the moving dimensions of IR.
 - (xiv) Where the work is planned to be done within 3.5m from the centre of the IR tracks, it shall require traffic block and all the necessary safety precautions shall be ensured as per the requirements of Para No . 806 and 807 of PWM of Indian Railways.
 - (xv) First aid kit shall be readily available at the site .
 - (xvi) In case any cable/utility is found while working, the Contractor shall inform the Authority’s Engineer immediately. In case a large number of cables / utilities are found during the excavation, the work shall be carried out in the presence of representative from the concerned owning agency of the utility / cable.
 - (xvii) It shall be ensured that the existing emergency sockets of IR are not damaged.

1.6.2.3 Additional measures required during traffic block:

- (i) Any work when infringing the moving dimensions of IR shall be started only after traffic block has been imposed and IR track is protected.



- (ii) All the work intended to be completed during traffic block shall be completed within the duration of the traffic block and the duration of the traffic block shall not be exceeded.
- (iii) Traffic block shall be considered as cleared only when all the temporary arrangements / machinery are cleared of the moving dimensions and the IR track is left with proper track geometry to allow IR trains to run safely.

1.6.2.4 Safety measures while working in OHE area:

- (i) While working near the OHE area, the safety guidelines as specified in para 20301, 20327, 20334, 20335, 20529, 20612, 20614, 20714, 20825, 20833, 21206 and 21207 of Volume II, Part 1 of AC Traction Manual of Indian Railways shall be followed.
- (ii) No electric work close to the live OHE shall be carried out without power block and specific approval from Authority’s Engineer / Authority.
- (iii) A minimum distance of 2m shall be maintained between live OHE wire and any body part of the workmen or tools or metallic support.
- (iv) No electric connection shall be tapped from OHE.

1.6.3 Excavation Affecting Existing Tracks:

While doing excavation near the vicinity of the existing tracks including for bridges and other structures, special care has to be taken to ensure that formation of the existing Railway line is not excavated, for that matter any activity involved in construction / execution of the project shall not endanger the safety of existing running line of Indian Railways. If excavation or any other activity involving working and or modification and or alteration of the existing permanent way then, before execution of such work, the Contractor shall prepare a drawing clearly indicating such alternation / modification of the existing permanent way, and the protection measure intended to be taken by the Contractor to ensure safety of the existing running line. The effectiveness of design of such protection measures is the sole responsibility of the Contractor and the Contractor shall indemnify the Authority’s Engineer /Authority towards the losses incurred due to failure of such protection measure. These protection measures duly indicating the extent of alternation/ modification to the existing formation shall be incorporated in the designand drawing submitted during preliminary design submission as per the Contract. Such work shall not be undertaken unless and until these drawings are consented by the Authority’s Engineer.

- 1.6.4 The Contractor shall indemnify the Authority’s Engineer/Authority against any damage to the existing tracks/structures/utilities caused by the actions of the Contractor or his sub-contractors, and shall make good the same, as directed by the concerned authorities, at his own cost and shall also pay any penalty/demurrages if levied by the concerned authorities.

1.7 Safety Requirements for Electrical Works

- (i) The Indian Electricity Rules 1956, as amended up to date, shall be followed. The detailed instructions on safety procedures given in I.S.S. and Indian



Electricity Rules, respective State Electricity Authorities' regulation with up to date amendment shall be applicable.

- (ii) The LT/HT distribution diagrams of sub stations shall be prominently displayed. The substation premises, main switch rooms and D.B. enclosure shall be kept clean whenever works are carried either inside or outside.
- (iii) No inflammable materials shall be stored in places other than the rooms specially constructed for this purpose in accordance with the provisions of Indian Explosives Act
- (iv) Rubber insulating mats of suitable size and thickness shall be provided in front of the main switch boards of sub-station or any other control equipment of medium voltage and above.
- (v) Protective and safety equipment such as rubber gauntlets or gloves, earthing rods, line men's belt, portable artificial respiration apparatus, safety goggles shall be provided as per the requirement of the Work.
- (vi) Necessary number of caution boards such as "Man working on line, Don't switch on" shall be readily available in the vicinity of electrical installation.
- (vii) Standard first aid boxes containing materials as prescribed by the St. John's Ambulance Brigade or Indian Red Cross shall be made available.
- (viii) Charts displaying methods of giving artificial respiration to a recipient of electrical shock (one in English and another one in the regional language) shall be prominently displayed at appropriate places.
- (ix) No work shall be undertaken on live installations, or on installation, which could be energized unless one another person is present to immediately isolate the electric supply in case of any accident and to render first aid, if necessary.
- (x) No work on live LT. bus bar or pedestal switch board in the sub stations shall be handled by a person below the rank of a Licensed Wireman and such a work shall preferably be done in the presence of a qualified engineer.
- (xi) When working on or near live installations, suitable insulated tool shall be used, and special care shall be taken to see that those tools accidentally do not drop on live terminals causing shock or dead short.
- (xii) The electrical switch controls in distribution boards shall be clearly marked to indicate the areas being controlled by them.
- (xiii) Before starting any work on the existing installation, it shall be ensured that the electric supply to that portion is cut off. Precautions, like displaying "Men at Work" caution boards on the controlling switches, removing fuse



carrier from these switches shall be taken against accidental operation.
Caution boards shall be kept with the person working on the installation

- (xiv) All electrical panels & switch gear shall conform to relevant IEC standard
- (xv) All external enclosures shall have degree of protection not less than IP-54
- (xvi) All equipment, system shall conform to relevant IEC standard on Electromagnetic compatibility (EMC).
- (xvii) Cable routes of all the newly laid cables by the contractor shall be identified with electronic or concrete markers.

1.8 Legislation and Codes of Practice:

- 1.8.1 The Contractor shall comply with all the safety and industrial health legislation including without limitation to the Rules and Regulations of National Safety Council of India. The Contractor shall keep at each site office sufficient copies of Safety and Industrial Health Regulations and related documents."
- 1.8.2 All regulations and documents as referred above shall be translated in to languages which are understood by the operators engaged by the Contractor or sub- contractor and such translations shall be displayed or kept alongside those in Hindi, English and Regional language.
- 1.9 Protection For Indian Railway Lines the Contractor shall design and install the temporary fencing / barricades for protection of the existing Indian Railway (IR) lines where the construction activities, adjacent to the line, are taking place. The fencing / barricades shall be installed and the fencing shall be movable and reusable and stable enough not to lean and infringe the structure gauge of the IR lines. The fencing pole /barricades shall be coloured to enhance visual precautionary effects. The Contractor shall develop the design of the temporary fencing / barricades as part of the Technical Design and submit to the Authority's Engineer for consent.

1.10 Damage and Interference:

- 1.10.1 Works shall be carried out in such a manner that there shall be no damage to interference with:
 - (a) water courses or drainage systems;
 - (b) public utilities;
 - (c) structures (including foundations), roads, including street fixtures, or other properties;
 - (d) public or private vehicular or pedestrian access,
 - (e) monuments, graves or burial grounds other than to the extent that shall be necessary for them to be removed or diverted to permit the execution of the Works, and
 - (f) Existing tracks, Bridges, Fixtures / OHE Masts of the existing tracks



of Indian Railways.

- 1.10.2 Heritage structures shall not be damaged or disfigured on any account. The Contractor shall inform the Authority’s Engineer as soon as practicable of any items which are not stated in the Contract to be removed or diverted but which the Contractor considers necessary to be removed or diverted to enable the Works to be carried out. Such items shall not be removed or diverted until the consent of the Authority’s Engineer to such removal or diversion has been obtained.
- 1.10.3 Assets / items of the Authority, Indian Railway, Other Contractors and any other entities which are damaged due to Contractor's operations / negligence during construction or are interfered with or removed to enable the Works to be carried out, shall be replaced / reinstated by the Contractor at his own cost to the same condition as existed before the Work started and to the satisfaction of the Authority’s Engineer and the concerned entity. In case of damage to the existing cables, the Contractor shall have suitable arrangement of joining the cables under technical supervision of IR/ relevant authority. In addition to this the Contractor shall also be responsible for any penal action or any claim as a result of the damage and shall indemnify the Authority’s Engineer, Authority, Indian Railway, Other Contractors and any other entities in this regard.
- 1.10.4 In case of obstructions due to interference, the Contractor shall comply with the requirements as described. Followings are the major required items as detailed therein;
- (a) Uncharted utilities
 - (b) Alternative Access
 - (c) Protection of Trees
 - (d) Removal of trees, graves and other obstructions
 - (e) Protection of adjacent structures

1.11 Handling of Utilities and Interferences:

- 1.11.1 Handling and shifting of the existing utilities identified within the Right of Way, such as
- a) The power lines of 33kV and below requiring permanent diversion; and
 - b) Other charted Railway owned utilities presently existing within Right of Way and requiring diversion/disposal are in the Scope of Work of the Contractor.
- 1.11.2 Alternative access which may be needed for all public or private premises when interference with the existing access occurs to enable the Works to be carried out, shall be arranged by the Contractor.



1.11.3 Trees, graves and other obstructions which may remain at the Site or the Work Areas shall be appropriately removed.

1.11.4 Identification of uncharted utilities within ROW shall be undertaken by the contractor by trial and/or using cable locator as consented by the Authority’s engineer. The results shall be summarized in Uncharted utility report and submit as part of the technical design.

1.12 Site Establishments:

1.12.1 The Contractor shall provide and maintain the Temporary Facilities and Temporary Utility Services, which comprise part of the Temporary Works for use of the Authority and Authority’s Engineer.

1.12.2 The Contractor shall provide and maintain all Temporary Works as required by him and as specified for execution of the Works.

1.12.3 Latrines and wash places:

Contractor shall provide latrines and wash places for the use of his personnel and all persons who will be on the site as per the requirements and in accordance with the local laws and regulations.

1.13. Testing of Works:

1.13.1 The Contractor shall be responsible for all on-site and off-site testing and for all in-situ testing. Daily on-site testing shall be coordinated with the Authority’s Engineer. A programme of proposed tests shall be provided on a weekly basis, at least one week in advance of such events.

1.13.2 Notification of required Factory testing shall be made in writing to the Authority’s Engineer, including full details of test requirement, at least 15 days in an advance of the test.

1.14 Provisions for Other works:

1.14.1 Provision of Masts for OHE:

For the mast installation to be done on bridges and tunnels, the Contractor shall prepare all necessary provisions as part of the permanent work. The Contractor shall ensure that this provision and the masts to be installed do not infringe the Structure gauge as specified in the Specification. This provision is not indicated in the Reference Drawings. Prior to design of the provision, the Contractor shall take all necessary steps to ensure that the provisions of the mast installation is coordinated and integrated with the works to be done later on.

1.15. Restoration of Work Areas Disturbed by Construction Unless otherwise directed by the Authority’s Engineer, any areas disturbed by the construction activity, either inside or outside the Right of Way, shall be reinstated as follows:



All areas affected by the construction work shall be reinstated to their original condition, with new materials, including but not necessarily limited to, sidewalks, parking lots, access roads, adjacent roads, properties and landscaping. Grass cover shall be provided for any bare earth surface areas, along with proper provisions for surface drainage.

2 Design Standards

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

S.N.	Description
1	Indian Railway Code, for the Engineering Department
2	Indian Railway Permanent Way Manual
3	Indian Railway Works Manual
4	Rules for the opening of a Railway for the Public Carriage of passengers
5	General & Subsidiary Rules, Pt.- I & II
6	Indian Railway Schedule of Dimensions & relevant IRS Specifications referred in the Manual.
7	Manual of Instruction of fabrication, installation and maintenance of glued insulated rail joint
8	Code of practice for Flash Butt Welding of rails
9	Code of practice for welding of rail joints by Alumino Thermit Process
10	Indian Railway Bridge Manual
11	IRS Concrete Bridge Code
12	IRS Code of practice for The design of substructures and foundation of Bridges
13	Bridge Rule 1964
14	IRS Specification (IRS B-1 and BS-110), BS -111 (HSFG)
15	IS:1786-1985, Specification for high strength deformed steel bars and wires for concrete reinforcement
16	IS:875
17	IS:456-2000, Plain and reinforced concrete code of practice
18	IS:383-1970, Specification for coarse & fine aggregates for concrete
19	IS:269-1989, Ordinary Portland Cement 33 grade specification
20	IS:8112-1989, 43 Grade Ordinary Portland Cement
21	IS:12269-1987, Specification for 53 Grade Ordinary Portland Cement
22	IS:516-1959, Method of testing for strength of cement
23	IS:1383-1980, Code of practice for pre-stressed concrete
24	IS:1948-1970, Classification & Identification of soils for general engineering purposes
25	IS:2062
26	Comprehensive guidelines and Specifications for Railway Formations pecification No. RDSO/2020/GE: IRS-0004, Sept.-2020



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Description
27	IRS: Code of practice for plain, reinforced & pre-stressed concrete for General Bridge Construction
28	RDSO Station Manual on Indian Railway
29	IS:800-1984, Code of practice for General construction in Steel
30	USFD Manual
31	Codes, Indian Railways Standard for Bridges, structures and other Subjects
32	Indian Railway Signal Engineering Manual
33	Signal Engineering Manual Appendix & II
34	ACTM Volume - I & II
35	Indian Railway Electricity Rules
36	Indian Railway Standard Code of Practice For The Design of Steel or Wrought Iron Bridges Carrying Rail, Road or Pedestrian Traffic (Steel Bridge Code) Adopted –1941 With latest correction slips
37	BS-126, Guidelines for continuation of LWR/CWR over ballasted deck
38	IRS Welded Bridge Code
39	Transition system on approaches of bridges, Report No GE: R-50
40	IS:808 Dimensions for hot rolled steel, Beam, Column and channel Section.
41	IS: 813 (1986) or its latest version “Scheme of Indian standard of symbols for welding”
42	IS: 802 (1995) or its latest version “Use of structural steel in overhead transmission line towers – code of practice”.
43	EN: 50119 “Fixed installation-Electric Traction Overhead Contact lines”.
44	IS: 1080 latest version “Code of practice for design and construction of shallow foundation”.
45	IS: 2720 latest version “Method of test of Soil”.
46	IS: 2911 latest version “Design and construction of pile foundations -code of practice”.
47	IS: 1904 latest version “Code of practice for design and construction of foundation requirement”.
48	IS: 6403 latest version “Code for determination of bearing capacity of soil”.
49	IS: 4091 (2011) “Code Of Practice for Design and Construction of Foundations for Transmission Line Towers and Poles”.
50	TI/IN/0035 “Instruction for testing of OHE structure’s foundation” issued by RDSO.
51	Design Manual For Electric Traction Vol.-III Traction Over Head Equipment (RITES).
52	RDSO Instruction No. TI/IN/0043 Rev.0 with latest amendments- PSI guideline for 2 x 25 KV system
53	RDSO Instruction No. TI/IN/0042 with latest amendments- OHE guideline for 2 x 25 KV system



Note: -

Indian Railways Permanent Way Manual, Indian Railway Bridge Manual, Indian Railway Schedule of Dimensions & relevant IRS Specifications referred in the Manual, Indian Railway Signalling Engineering Manual, Indian Railway Telecom Manual, & relevant IRS/RDSO Specifications referred in the Manual, AC Traction Manual, Rules for Opening Railways.

2.1 Galvanization of all steel outdoor works

Steel structure for outdoor, SSP, AT (if any) and those required for support of Over head equipments, all small part steel works (SPS) shall be hot deep galvanized as per RDOS's specifications no. ETI/OHE/13 (4/84) A & C-4 i.e. minimum coating of zinc shall be 610 gm/m² except or marine and chemically polluted area. The polluted area shall be identified as a result of pollution mapping by the contractors and approved by engineers, where zinc coating shall be 1000 gm/m².

2.2 The RDSO Guideline/Specifications/Drawings applicable for 2x25kV (differing from existing 25 KV system) system are as under:

S.N.	Description	Drawing/Specification
A	OHE	
1	25kV Feeder Arrangement on Separate Mast	TI/DRG/OHE/FEEDER/RDSO/00001/19/0 or latest
2	Employment Schedule for 25kV Feeder Arrangement on Separate mast for 155kgf Wind Pressure	TI/DRG/CIV/FEEDERES/RDSO/00001/20/0 (Sheet-I) or latest
3	Feeder Termination Drawing	RE/33/G/05145-1, Rev. A or latest
4	Employment Schedule for OHE Mast (9.5m) wind pressure 155kgf/m ² & 2.8 m/3.8 m/4.85 m implantation (OHE +Feeder wire + Earth wire) for 1200 kgf tension in 65 mm ² catenary wire & 1200kgf tension in 107 mm ² contact wire.	TI/DRG/CIV/ES/RDSO/00001/23/0 (Sheet 12, 13, 14) or latest
5	General Arrangement of OHE with Feeder, Earth wire & BEC (1200+1200)	TI/DRG/OHE/FEEDER/RDSO/00002/19/0 or latest
6	Territorial limits of revised wind zones	Annexure – 19, RDSO TI/IN/0042 or latest
7	Counter Weight Eye Rod	ETI/OHE /SK/588 Rev. B or latest
8	Counter Weight Assembly	ETI/OHE/SK/587 Rev. B or latest
9	X-Y adjustment Chart	TI/DRG/OHE/ATD/RDSO/00003/99/0 or latest
10	Dropper Schedule	TI/DRG/OHE/DROP/ 00001-00007/18/0 & TI/DRG/OHE/DROP/RDSO/00001/20/0 or latest
11	CEDE/NCR letter no. EL/TRD/NCR/Gatimaan dated 19.11.2018	Annexure – 31, RDSO TI/IN/0042 or latest



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S.N.	Description	Drawing/Specification
12	25mm drop Bracket Assembly	ETI/OHE/P/2360- Rev. N or latest
13	BFB Steady Arm Assembly	ETI/OHE/P/2390-Rev. C or latest
14	Current Carrying Dropper Assembly	TI/DRG/OHE/CCD/RDSO/00001/20/0 or latest
15	Catenary wire Clamp for Current Carrying Dropper	TI/DRG/OHE/CCD/RDSO/00002/20/0 or latest
16	Contact wire clamp for Current Carrying Dropper	TI/DRG/OHE/CCD/RDSO/00003/20/0 or latest
17	Compression sleeve, thimble & cable lug for Current Carrying Dropper	TI/DRG/OHE/CCD/RDSO/00004/20/0 or latest
18	Mounting details of Double Pole Isolator on Mast (For 2X25kV)	ETI/OHE/G/06005-Sheet 2 or latest
19	Mounting Details of Double Pole Isolator on Portals (For 2X25kV)	ETI/OHE/G/06008 or latest
20	Mounting Details of Double Pole Isolator on Portals (For 2X25kV)	ETI/OHE/G/06008 or latest
21	Railway Board letter No. 2001/Elect (G)/170/1 Pt dated 07.05.2012	Annexure – 40, RDSO TI/IN/0042 or latest
22	Tee Connector suitable for 20mm dia GS wire to 20mm dia GS wire	TI/DRG/OHE/TC/RDSO/00001/20/0 or latest
23	Straight Connector suitable for 20mm dia GS wire to 20mm dia GS wire	TI/DRG/OHE/SC/RDSO/00001/20/0 or latest
24	Cross Bonding Arrangement	TI/DRG/OHE/EARTHING/RDSO/00001/20/0 or latest
25	BEC Arrangement on Bridges and Platform Coping	Annexure – 45, RDSO TI/IN/0042
26	Railway Board letter No.2001/Elect(G) 170/1 Pt-III dated 07.08.2020	Annexure – 46, RDSO TI/IN/0042
27	Railway Board letter No.2001/Elect(G) 170/1 Pt-II dated 16.10.2020	Annexure – 47, RDSO TI/IN/0042
28	Three Pulley Higher Tension ATD	TI/SPC/OHE/3PHTA TD/0150 with ACS 1 or latest
B	PSI	
1	132kV, 1250A Triple Pole Isolator (with earth blade)	TI/SPC/PSI/ISOLTR/0210(06/21) or latest
2	132kV, 1250A Triple Pole Isolator (For Bus Coupling)	TI/SPC/PSI/ISOLTR/0210(06/21) or latest
3	132kV, 1250A Triple Pole Isolator (without earth blade)	TI/SPC/PSI/ ISOLTR/0210 (06/21) or latest
4	50kV Double Pole Manual Isolator (2000A)	TI/SPC/PSI/ISOLTR/0210(06/21) or latest



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S.N.	Description	Drawing/Specification
5	25kV Double Pole Manual Isolator (2000A)	TI/SPC/PSI/ISOLTR/0210(06/21) or latest
6	25 kV Double Pole Motorised isolator (2000A)	TI/SPC/PSI/ ISOLTR/0210 (06/21) or latest
7	25kV Single Pole Manual Isolator (2000A)	TI/SPC/PSI/ISOLTR/0210(06/21) or latest
8	132kV SF6 Circuit Breaker (Triple Pole)	TI/SPC/PSI/HVCB/ 0121 (05/21) with A&C slip no. 01 or latest
9	50kV Double pole SF6 Breaker (2000A)	TI/SPC/PSI/HVCB/ 0121 (05/21) with A&C slip no. 01 or latest
10	25kV Double Pole Vacuum Circuit Breaker (2000A)	TI/SPC/PSI/LVCBIN/0120(12/13) with A&C slip no. 01 or latest
11	25kV Double Pole Vacuum Interrupter (2000A)	TI/SPC/PSI/LVCBIN/0120(12/13) with A&C slip no. 01 or latest
12	132kV Current Transformer (accuracy class 0.2s) for ABT metering (Metering)	To be procured as per the specification/sources of DISCOMs/Power utilities
13	132kV (800-400/5) Current transformer (For Transformer Protection)	TI/SPC/PSI/CT/0210(06/21) or latest
14	50kV Current Transformer (1500-750/5)	TI/SPC/PSI/CT/0210(06/21) or latest
15	25kV Current Transformer (1500-750/5A)	TI/SPC/PSI/CT/0210(06/21)
16	25kV Current Transformer (200-100/5A) (For compensation equipment)	TI/SPC/PSI/CT/0210(06/21) or latest
17	132kV Potential Transformer (accuracy class 0.2) for ABT metering (Indication and Metering)	To be procured as per the specification/sources of DISCOMs/Power utilities
18	27.5kV/110V Potential Transformer (Type-II) (72.5kV Insulation Class)	TI/SPC/PSI/PT/0210(06/21) or latest
19	27.5kV/110V Potential Transformer (Type-II) (52kV Insulation Class)	TI/SPC/PSI/PT/0210(06/21) or latest
20	27.5kV/110V Potential Transformer (Type-I) (52kV Insulation Class)	TI/SPC/PSI/PT/0210(06/21) or latest
21	60/84/100MVA, 132/2X25kV Single Phase Traction Power Transformer with Bushing CTs	TI/SPC/PSI/TRNPWR/5200 (02/21) with A&C slip no. 01 or latest
22	12.3MVA Autotransformer (55/27.5kV) with Bushing CTs	TI/SPC/PSI/AUTOTR/1200 (02/21) or latest
23	8MVA Autotransformer (55/27.5kV) with Bushing CTs	TI/SPC/PSI/AUTOTR/1200 (02/21) or latest
24	50kVA, 25kV/240Volt LT supply transformer	ETI/PSI/15 (08/03) or latest
25	10kVA, 25kV/240Volt LT supply transformer	ETI/PSI/15 (08/03) or latest



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Description	Drawing/Specification
26	120kV Lightening arrester (HV Side)	ETI/PSI/137(08/89) with A&C slip no. 01 to 07 or latest
27	60kV Lightening arrester	ETI/PSI/137(08/89) with A&C slip no. 01 to 07 or latest
28	42kV Lightening Arrester - on gantry with 25kv PI	TI/SPC/PSI/MOGTLA/0101 (02/15) or latest
29	132kV Support Insulator	TI/SPC/OHE/POST/0100 (01/10) with A&C slip no.01. or latest
30	66kV Support Insulator	TI/SPC/OHE/POST/0100 (01/10) with A&C slip no.01. or latest
31	50kV Support Insulator	TI/SPC/OHE/POST/0100 (01/10) with A&C slip no.01. or latest
32	25kV Support Insulator	TI/SPC/OHE/INS/0070 (04/07) with A&C slip no. 01 & 02 or latest
33	Shunt capacitor 2400kVAR at 25kV	TI/SPC/PSI/FC&SR/ 0100 (01/10) or latest
34	Series Reactor for Low loss	TI/SPC/PSI/FC&SR/ 0100 (01/10) or latest
35	25kV Drop Out Fuse	ETI/PSI/14(01/86) with A&C slip no. 01 or latest
36	Low Tension Distribution Panel	TI/SPC/PSI/LTDPNL/0210 (10/21) or latest
37	Lead Acid Batteries 110V, 250AH	RDSO/PE/SPEC/TL /0040 (Rev. '2')-2021 or latest
38	110 V Battery Charger	TI/SPC/PSI/200-250/CHGR/0210 (07/21) or latest
39	Lead Acid Batteries 110V, 150AH	RDSO/PE/SPEC/TL /0040 (Rev. '2')-2021- or latest
40	110 V Battery Charger	TI/SPC/PSI/40-150/CHGR/1210 (07/21) or latest
41	Control & Relay Panel, Incorporating Numerical Type Protective Relays given as under for TSS	TI/SPC/PSI/PROTCT/ 7101 or latest
42	Control & Relay Panel, Incorporating Numerical Type Protective Relays given as under for Capacitor Bank	TI/SPC/PSI/PROTCT/ 7101 or latest
43	Control & Relay Panel, Incorporating Numerical Type Protective Relays given as under for SP	TI/SPC/PSI/PROTCT/ 7101 or latest



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S.N.	Description	Drawing/Specification
44	Control & Relay Panel, Incorporating Numerical Type Protective Relays given as under for SSP	TI/SPC/PSI/PROTCT/ 7101 or latest
45	Tee Connector to suit “BERSISMIS” ‘AAAC’ and “BERSISMIS” ‘AAAC’ in 2X25 kV system	TI/DRG/PSI/CONECT/RDSO/00053/21/0 or latest
46	Tee Connector to suit BULL ‘AAC’ conductor and BULL ‘AAC’ conductor in 2X25 kV system	TI/DRG/PSI/CONECT/RDSO/00054/21/0 or latest
47	Rigid connector on S.I. to suit BERSISMIS (36mm Dia.) “AAAC” conductor in 2X25 kV system	TI/DRG/PSI/CONECT/RDSO/00055/21/0 or latest
48	Rigid connector on S.I. to suit BULL (38.25mm Dia.) “AAC” conductor in 2X25 kV system.	TI/DRG/PSI/CONECT/RDSO/00056/21/0 or latest
49	Flexible connector to suit 50MM O/D Al. Tube Bus bar for Double Pole circuit breaker and LV side of Traction transformer in 2X25kV system	TI/DRG/PSI/CONECT/RDSO/00057/21/0 or latest
50	Rigid through connector to suit BERSISMIS (36mm Dia) “AAAC” Conductor and SPIDER “AAC” conductor for 25 kV PT type II. (T-Type)	TI/DRG/PSI/CONECT/RDSO/00058/21/0 or latest
51	Rigid through connector to suit BULL (38.25mm Dia) “AAC” Conductor and SPIDER “AAC” conductor for 25 kV PT type II (T-Type)	TI/DRG/PSI/CONECT/RDSO/00059/21/0 or latest
52	Tee Connector to suit 50 O/D Al. Tube and “BERSISMIS” ‘AAAC’ conductor in 2X25 kV system	TI/DRG/PSI/CONECT/RDSO/00060/21/0 or latest
53	Tee Connector to suit 50 O/D Al. Tube and BULL ‘AAC’ conductor in 2X25 kV system	TI/DRG/PSI/CONECT/RDSO/00061/21/0 or latest
54	Typical Termination arrangement for strung bus “BERSISMIS” (AAAC) conductor in 2X25 kV system	TI/DRG/PSI/CONECT/RDSO/00062/21/0 or latest
55	Typical Termination arrangement for strung bus “BULL” (AAC) conductor in 2X25 kV system	TI/DRG/PSI/CONECT/RDSO/00063/21/0 or latest



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S.N.	Description	Drawing/Specification
56	Flexible connector to suit BULL (38.25mm Dia.) “AAC” Conductor for Double Pole circuit breaker and LV Side of traction transformer in 2X25kV System	TI/DRG/PSI/CONNECT/RDSO/00064/21/0 or latest
57	Bimetallic terminal Connector to suit ZEBRA (28.58mm Dia.) ACSR conductor & AL/CU Pad of isolator/CT/CB or 50mm O/D Al tube and AL/CU Pad of isolator/CT/CB	ETI/PSI/P/11030 Mod. D or Latest
58	Typical layout of 132/2X25kV Traction Sub Station with Scott Connected Transformers (For Double Line section) with parallel to track.	TI/DRG/PSI/AT/RDSO/00009/20/1 Mod C or latest
59	Typical layout of 132/2X25kV Traction Sub Station with Scott Connected Transformers (For Double Line section) with perpendicular to track.	TI/DRG/PSI/AT/RDSO/00010/20/1 Mod C or latest
60	General arrangement of Sub Sectioning and Paralleling Post (SSP) in 2X25kV ‘AT’ System (on double line section) for Scott Connected Transformer TSS	TI/DRG/PSI/AT/RDSO/00015/20/01 Mod or latest A
61	General arrangement of Sectioning and Paralleling Post (SP) in 2X25kV ‘AT’ System (on double line section) for Scott Connected Transformer TSS	TI/DRG/PSI/AT/RDSO/00016/20/01 Mod or latest A
62	General arrangement of Sub Sectioning and Paralleling Post (SSP) in 2X25kV ‘AT’ System (on double line section) for VConnected Transformer TSS	TI/DRG/PSI/AT/RDSO/00036/20/01 Mod or latest A
63	General arrangement of Sectioning and Paralleling Post (SP) in 2X25kV ‘AT’ System (on double line section) for V Connected Transformer TSS	TI/DRG/PSI/AT/RDSO/00037/20/01 Mod or latest A
64	General arrangement for Boundary Sectioning and Paralleling Post (SP) in 2X25kV ‘AT’ System (on double line section) for Scott connected Transformer TSS	TI/DRG/PSI/AT/RDSO/00021/20/01 Mod or latest A
65	Typical schematic diagram of protection for 132/2x25kV Traction sub-station with Scott-connected transformers	TI/DRG/PSI/AT/RDSO/00051/21/0 Mod A or latest



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S.N.	Description	Drawing/Specification
66	General scheme of supply for 2x25 kV, 50 Hz Scott connected traction transformer traction system	TI/DRG/PSI/SLD/RDSO/00045/21/0 or latest
67	Typical layout of cable trench, foundation & cable schedule of 132/2x25 kV Traction Sub – Station with Scott connected transformers (for four line section) with parallel to track	TI/DRG/PSI/TRCSFD/RDSO/00047/21/0 or latest
68	Typical layout of cable trench, foundation & cable schedule of Sectioning and Paralleling Post (SP) in 2x25 kV AT System on Double line for Scott Connected Transformer TSS.	TI/DRG/PSI/AT/RDSO/00052/21/0 or latest
69	Typical layout of Control room Building in 2X25kV Traction Sub-Station.	TI/DRG/PSI/CR2X25/RDSO/0210 or latest
70	Typical layout of Control room Building in 2X25kV SP/SSP/AT Post.	TI/DRG/PSI/CR2X25/SPSSPATP/0210 or latest
71	Earthing PSI	TI/SPC/PSI/ERTHNG/ 0210 or latest
72	RDSO letter No. TI/PSI/TSS/Policy/17 dtd 13.10.2017	Annexure-1, RDSO TI/IN/0043 Rev-1
73	RDSO letter No. TI/PSI/TSS/Policy/18 /02 dtd 30.07.2018	Annexure-2, RDSO TI/IN/0043 Rev-1
74	RB letter No. 2008/RE/170/1 dated 12.06.12	Annexure-3, RDSO TI/IN/0043 Rev-1
75	Typical return current connection to buried rail at 132/25 kV traction substation.	ETI/PSI/0212-1 or latest
76	Typical general arrangement of earth screen wire termination at Traction substation	ETI/PSI/0225 Mod C or latest
77	General arrangement & terminal connection for 25kV PT Type-II at TSS.	ETI/PSI/0227 Mod A or latest
78	25kv D.O. Fuse switch assembly	ETI/PSI032 Mod D or latest
79	Typical fencing layout at traction Substation (Details of fencing panel, door, anticlimbing device)	ETI/PSI/121 Mod F or latest
80	Typical arrangement of an earth electrode	ETI/PSI/222-1 or latest
81	Typical earthing, cable trench & foundation layout of 132/25kv TSS	ETI/PSI/224 Mod E or latest
82	Typical earthing arrangement for equipment/ structure at TSS	ETI/PSI/228 Mod A or latest
83	Typical earthing cable trench and foundation layout of 132/25kV traction sub-station with Shunt Capacitor bay	ETI/PSI/229 or latest



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S.N.	Description	Drawing/Specification
84	Typical details of cable run at a two transformer TSS	ETI/PSI/323 Mod E or latest
85	Part Plan for Details of position of feeder Bus coupling interrupter at TSS	ETI/PSI/SK/272 or latest
86	Typical layout for 25kv Shunt capacitor with series reactor to be installed at 132/25kv TSS	ETI/PSI/0223 or latest
87	Typical details of cable run at a two transformer TSS with Shunt Capacitor	ETI/PSI/325 or latest
88	Typical number plate for circuit breaker	ETI/PSI/P/7523 or latest
89	Typical number plate for Auxiliary Transformer	ETI/PSI/P/7525 or latest
90	Typical number plate for Power transformer at TSS	ETI/PSI/P/7526 or latest
91	Typical number plate for PT at TSS	ETI/PSI/P/7527 Mod A or latest
92	Typical number plate for CT at TSS	ETI/PSI/P/7528 Mod A or latest
93	Typical number plate for Isolators at TSS	ETI/PSI/P/7529 Mod A or latest
94	Bimetallic terminal connector to suit 'ZEBRA' ACSR conductor and 30 dia. Cu stud of CT/CB/traction power transformer	ETI/PSI/P/11010 Mod C or latest
95	220kV system bimetallic terminal connector to suit 'ZEBRA' (28.58 Dia.) ACSR conductor & Al./Cu. pad of Isolator /CT/CB.	ETI/PSI/P/11030 Mod D or latest
96	220kV system tee connector to suit 'ZEBRA' (28.58 dia.) ACSR conductor on both ways	ETI/PSI/P/11040 Mod C or latest
97	220kV system rigid connector on SI to suit ZEBRA (28.58 dia.) ACSR conductor	ETI/PSI/P/11050 Mod C or latest
98	Details of expansion type terminal connector to suit 50 dia. Al. tubular busbar to terminal pad of 25kv CT/ Isolator/ CB and Interrupter	ETI/PSI/P/11060 sh. 2 of 2 Mod E or latest
99	Detail of rigid type bimetallic terminal connector suitable for 50 dia. Al. tubular busbar to 30 dia. Cu. Stud of 25kV CT	ETI/PSI/P/11070 Mod B or latest
100	Rigid bimetallic terminal connector suitable for 50 dia. Al. tubular busbar to terminal pad of 25kv Isolator/ CT	ETI/PSI/P/11090 Mod C or latest



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S.N.	Description	Drawing/Specification
101	Rigid through connector to suit 50 dia. Al. Tubular bus bar and ‘SPIDER’ AAC conductor for 25kv PT Type-II	ETI/PSI/P/11110 Mod C or latest
102	Details of Rigid terminal connector suitable for 20 dia. Al. Conductor to terminal pad of 25kv PT Type I & II	ETI/PSI/P/11120 Mod C or latest
103	25 K.V system Tee connector to suit 50. O/D AL. tubular busbar to 50. O/D AL. tubular busbar	ETI/PSI/P/11150 Mod B or latest
104	25Kv System Rigid bus splice connector to suit 50 O/D Al. tube on both ways	ETI/PSI/P/11180 Mod C or latest
105	25 kV System Sliding clamp for 50mm O/D Aluminium Bus bar	ETI/PSI/P/11190 Mod C or latest
106	25Kv System Rigid connector on S.I to suit 50mm O/D Al. Bus bar	ETI/PSI/P/11200 Mod C or latest
107	25kv system expansion bus coupler on SI to suit 50 O/D Al. tube.	ETI/PSI/P/11210 Mod D or latest
108	Typical fencing, door and anticlimbing device details of traction sub-station	CORE/ALD/PSI/01 Mod D or latest
109	25 kV drop out fuse switch details	ETI/PSI/038 Mod B or latest
110	Operating pole for 25kV drop out fuse switch	ETI/PSI/039 Mod B or latest
111	Scheme of locking /Interlocking arrangement of 132 kV Isolator at Traction Sub-Station.	ETI/PSI/5212 Mod B or latest
112	Flexible connector for 25 kV circuit breaker 25kV Interrupter & 25 kV side of 13.5/20 MVA traction transformer	ETI/PSI/P/6570 Mod F or latest
113	Scheme of Interlocking arrangement for 25kV circuit breakers at Traction Sub-Station	ETI/PSI 5214 Mod B or latest
114	Expansion type terminal connector for 25 kV, 60mm dia. terminal for traction power Transformer	ETI/PSI/P/11220 Mod D or latest
115	Typical layout of remote control cubicle at switching stations.	ETI/PSI/0010 Mod E or latest
116	Schematic inter connection diagram for remote control of power gear & supervision equipments at TSS.	ETI/PSI/644 Mod C or latest
117	Schematic inter connection diagram for remote control of power gear and supervision equipments at controlled station (SP & SSP).	ETI/PSI/645 Mod C or latest
118	Control desk arrangement for 2 work stations of SCADA system.	ETI/PSI/SK/337 or latest



S.N.	Description	Drawing/Specification
119	Setting up earthing station at switching posts (SSP & SP) with conventional earthing as per Special Maintenance No. TI/SMI/0032 Rev-2.	
C	SCADA	
1	SCADA system	TI.SPC/RCC/SCADA/0134 or latest
D	AFL (Automatic Fault Locator)	
1	AFL system	TI/SPC/PSI/AFL/0240 or latest

Note: The above list is indicative other RDSO/CORE drawing may also be referred.

2.3 List of Guidelines:

- 2.3.1 RDSO Instruction No. TI/IN/0043 Rev.1 with latest amendments- PSI guidelines for increasing speed potential to 160KMPH in connection with NDLS-HWH & NDLS-BCT Routes and Schematic diagrams for TSS, SP & SSPs issued by RDSO for 2 lines section.
- 2.3.2 Railway board guidelines for illumination level as per letter no. 2004/Elect G/109/1 dated 18.05.2007.

2.4 Procurement of Items:

- 2.4.1 All the item to be utilized in 2x25 Traction system as per the specification available in RDSO/CORE approved Source / Supplier.
- 2.4.2 2x25 kV Traction system project procurement of items shall be done as part of EPC contracts as complete package, with performance guarantee, against key performance indicators (KPIs) with provision of defect liability and maintenance clauses built in. The EPC contractor shall procure the items from RDSO approved/developmental vendors (wherever applicable) duly follow existing guidelines of RDSO and Railway board.
- 2.4.3. The existing RDSO policy of vendor development in works contract: wherever sources have been approved and developmental, ordering on developmental sources shall be limited upto 20% of the total quantity. The balance quantity thus has to be procured from approved sources.
- 2.4.4. Status of vendor to be taken as on tender opening date: The status of the vendor (i.e. approved or developmental vendor) shall be reckoned as on the date of tender opening and not thereafter.
- 2.4.5. The above guidelines should be strictly followed by the Railway contractors, who are directly buying material through RDSO Approved/Developmental firms while executing EPC projects.
- 2.4.6 All the items procured for the instant work should be inspected by RITES/RDSO/3rd party Inspection as approved by competent authority. If in any case items need to be inspected by consignee, then prior approval from competent authority should be taken.



2.5 DESIGN SPECIFICATIONS

2.5.1 The Contractor shall establish an office for his dedicated design team in the Main Site Office of the Contractor and referred to as Design Team. The Design Team shall function from this office and all meetings and discussions relating to design shall be held in this office or in the office of Authority's Engineer / Authority and / or as instructed by the Authority's Engineer. In addition to the requirements herein, the Contractor shall, whenever the Authority's Engineer so requests, provide information and participate in discussions that relate to design matters.

2.5.2 The Contractor shall ensure that the Design Team continues to be represented at Site at all times by staff whose seniority and experience are to the satisfaction of the Authority's Engineer and whose representative shall be available on the Site as necessary or as required by the Authority's Engineer. If the Authority's Engineer asks (in writing) the Contractor to remove a person of his Design Team stating the reasons thereof, the Contractor shall ensure that the person leaves the Site within seven (7) days and shall have no further connection with the Works in the Contract. The Authority's Engineer shall also seek consent of the Authority in this regard.

2.5.3 There are Four Design Submissions covering the Design Phase and Construction Phase:

(i) Inception Report

(ii) Technical Design

(iii) Construction Design

(iv) As-Built Documents

The requirements for each design stage are detailed in Article 10 of the EPC Agreement.

2.5.4 The Contractor shall submit plans, programmes, reports, manuals and drawing as specified in Article 10 of the EPC Agreement for the four design stages in accordance with the provisions herein and as further detailed in Article 10 of the EPC Agreement to the Authority's Engineer for consent and issue of Notices of No Objection. It shall also include the additional information as required by the Authority's Engineer.

2.5.5 The Authority Engineer shall review the submissions to be satisfied that the submittal covers the obligations and intended purpose of the design of the Works and fully complies with the Contract.

2.6 Contractor's Organization during Design Phase



2.6.1 Project Organization Plan

- (1) The Contractor's Personnel shall be deployed and maintained as necessary or as required by the Authority's Engineer.
- (2) Within 45 days after the Appointed Date, the Contractor shall submit the Project Organization Plan which includes complete project organization chart during the Design Phase, equipped with the functions in a manner as described in Article 11 [Quality Assurance]. The Contractor shall deploy fully qualified personnel in the Design Team with the Authority Engineer's consent for each key personnel during the Design Phase. This plan shall be updated and resubmitted whenever there are changes to the personnel. The Plan shall show the management structure and state clearly the duties, responsibilities and authority of each key and staff member.
- (3) The Contractor shall establish the Design Team in his organization independent of the Construction Team, which shall be also maintained in the construction phase to ensure that the Contractor's design development strictly complies with the Technical Design which has received 'Notice of No Objection' from Authority's Engineer and also the Authority's Requirements and Specifications without being harmed by the adverse position of the Contractor against the Authority as detailed in Article 11 [Quality Assurance].

2.7. Requirements during Design Phase

2.7.1 Inception Report

- (1) Within 45 days after the Appointed Date, the Contractor shall submit the Inception Report as described herein and as further detailed in Article 10 of the EPC Agreement to the Authority's Engineer for consent and issue of a Notice of No Objection.
- (2) The Inception Report shall be based on the Contractor's Bid Design and shall be sufficiently developed including the main documentation needed to prepare and to develop the Technical Design and to demonstrate compliance with design requirements, including, but not limited to, survey and investigation plans, design submission plan and programme, reviews of the Authority's Documents. The Inception Report shall sufficiently define the main structures, track alignment & track components, non-traction power supplies and building services. Full details of the contents of the Inception Report are given in Article 10 of the EPC Agreement and the submittals are summarized in Article 10 of the EPC Agreement.

2.7.2 Technical Design

- (1) During the preparation of the Technical Design, the Contractor shall in particular:
 - (a) complete all calculations and analysis;



- (b) delineate all main and all other significant elements;
 - (c) complete all tests and trials and all selection of materials and equipment;
 - (d) assess and take full account of the effect on the Works of the proposed methods of construction, installation, testing and commissioning and temporary works.
 - (e) complete the validation of all the data provided by the Authority including all the additional surveys, investigations and testing as considered necessary by the Contractor to develop the Technical Design of the Works in accordance with the Contract.
 - (f) draw up a set of the Technical Drawings as summarized in Article 10 of the EPC Agreement.
- (2) Engineering studies and comparative evaluations shall be performed to ensure that the designs incorporate features to achieve optimum performance of all elements.
 - (3) Upon issue of the "Notice of No Objection" in respect of the Technical Design Report, the Contractor shall complete the design in all respects and produce Technical Drawings.
 - (4) The Temporary Works as defined in Schedule ‘C’ [Temporary Works] shall also be identified as a separate Works Segment and the design of those shall be proposed by the Contractor early enough to have sufficient discussions on engineering and procedural issues with the Authority’s Engineer so as to meet the intent of the Authority's Requirements. The Contractor shall submit the agreed design of the Temporary Works as part of the Technical Design to the Authority’s Engineer for consent.
 - (5) The Contractor shall provide to the Authority’s Engineer five original full and latest editions of the publications/Technical Standards including the Codes and Standards and other documents that the Contractor propose to use for carrying out the Technical Designs, including other communications between Authority’s Engineer and the Contractor relevant to this Contract as part of the Inception Report. These publications / documents shall be for the sole use of the Authority’s Engineer and, upon completion of the Contract, shall become the property of the Authority.

2.8 Requirements during Construction Phase

The principal requirements during the Construction Phase are the production, submission and consent of the Construction Design, the As-Built Documents.



2.8.1 Construction Design

- (1) Upon the issue of a Notice of No Objection in respect of a Technical Design Package, the Contractor shall produce the respective Construction Design Package which shall include, but not limited to,
 - (a) the Technical Drawings,
 - (b) the updated Specifications (if any) including Method Statements/ work procedures/ construction sequences,
 - (c) the Working Drawings
 - (d) the Construction Practicing Documents including site sketches, bar bending schedules, bar reference drawings, fabrication and shop drawings, erection sequences and
 - (e) Works Management Plans as detailed in Article 10 of the EPC Agreement. They shall be endorsed by the Contractor through the Contractor Internal Authorising Process as being in accordance with the Technical Design for which the Contractor has received the "Notice of No Objection"
- (2) The Construction Design and Construction Technical Drawings including updated Specifications (if any) / Method Statements shall be derived directly from the Technical Design as consented by the Authority's Engineer including changes that may be necessary to resolve the comments of the Authority's Engineer attached to the Notice of No Objection.
- (3) The Working Drawings and the Construction Practicing Documents shall be prepared to facilitate construction to meet the required workmanship as well as technical requirements. The Works Management Plans shall be prepared to check and monitor the Works and Quality Assurance requirement described in Article 11 of the EPC Agreement. The submittals are summarized in Article 10 of the EPC Agreement.
- (4) All those drawings and documents are revised, upgraded, detailed and integrated in the Construction Design Package. The Contractor shall fully verify the Construction Design Package through the Internal Authorization Process along with Design Certificate as described in Article 11 of the EPC Agreement by endorsing the original paper drawings and documents.
- (5) Upon the Internal Authorization Process, as specified in Article 11 of the EPC Agreement the Contractor shall submit the Construction Design Package as the "Request for Construction" as further detailed in Article 10 of the EPC Agreement, to the Authority's Engineer for consent and issue of a Notice of No Objection.
- (6) Upon receipt of the "Notice of No Objection" or "Notice of No Objection with Comments", the Contractor shall endorse the original paper drawings in respect of the Working Drawings as "Good For Construction" as per the Internal Authorization Process as defined in the Design Quality Assurance



Plan as per Article 11 of the EPC Agreement. If the Authority’s Engineer so requires, the said endorsed original paper drawings shall be re-submitted to the Authority’s Engineer, who shall, if has no objection to the contents of the re-submission, further endorse the original paper drawings by stating that he has no objection to the proposed Working Drawings. On endorsement by the Authority’s Engineer, the original drawings shall forthwith be returned to the Contractor as Working Drawings to be issued to Site.

- (7) The Contractor shall submit the Construction Design and Drawings for a particular work to the Authority’s Engineer at least 3 months but not more than 6 months prior to the planned / schedule date of commencement of that particular work.

2.9 As-Built Documents

- (1) The Contractor shall maintain all records necessary for the preparation of the As-Built Documents. The Contractor shall prepare and submit the As-Built Drawing and the Records which, subject to the Authority Engineer's agreement, shall become the contents of the As Built Documents. The Records are defined and detailed in Article 11 of the EPC Agreement.
- (2) The As-Built Drawings shall be a full set of the latest revisions of the Construction Technical Drawings, which are updated to incorporate all Design Change Notices and Field Change Notices and as many Working Drawings as necessary to convey a full and true record of the as-built condition of the Works. The As-Built Drawings shall show all changes from the Construction Design, all construction deviations and all other features relevant to the future maintenance and management of the Railway and its facilities. The As-Built Drawings shall be endorsed by the Contractor as true records of the construction of the Works.
- (3) The As-Built Records shall include survey results including geotechnical, all inspection records, and other documents as detailed in Article 10 of the EPC Agreement and shall be verified and endorsed by the Contractor through the Internal Authorization Process, as specified in Article 11 of the EPC Agreement as true records of the construction of the Works.
- (4) The As-built drawings and records shall also be digitised as a “master document” which shall be “tamper proof” and these copies of the” master document” shall be submitted to Authority’s Engineer for record of authority and other maintenance organisation.
- (5) The contractor shall also carry out all data feeding required for TMS as per prescribed format.

2.10 Contractor's Coordination with Others

2.10.1 Interfacing Parties and Related Parties

The Contractor shall fully coordinate the design of the Works with Interfacing Parties, all relevant bodies, parties and entities, in particular



government authorities, departments and regulatory bodies, utility companies, and the consultants, and contractors of adjacent projects whether ongoing or planned, as advised by the Authority's Engineer. The Contractor shall identify all such related parties, bodies and entities in his Interface Management Plan (IMP) and other relevant requirements.

2.11 Design Review Procedures

2.11.1 Design Submissions

- 1) In the case of submissions subsequent to the Technical Design, the Design Data shall be in accordance with the Authority's Requirements and the Technical Design.
- 2) The Contractor shall submit to the Authority's Engineer all the Designs and relevant Design Data together with the Design Certificates, on or before the respective dates for submission shown on the Design Submission Programme or the Works Programme. In the event that a resubmission of Design / Design Data is required, such resubmission shall be made as soon as practicable after the receipt of the relevant statement of objections. All submissions of Design Data shall include the copies as stipulated in the Authority's Requirements.
- 3) Following receipt of a submission of Design and Design Data, the Authority's Engineer shall, within the period specified in Article 10 of the EPC Agreement to the Authority's Requirements, respond as per the procedure defined in Article 10 and issue "Notice of No Objection" or "Notice of No Objection with 'A' Comments" or "Notice of Objection with Comments" as the case may be. The Contractor shall comply with the requirements accordingly as specified therein.
- 4) The issue of a Notice of No Objection in relation to any submission of Design shall be entirely without prejudice to the review of subsequent submissions of Design or to any request for a Contractor's Variation, and shall not bind the Authority's Engineer in any manner whatsoever when deciding whether to accept or not to accept the issue.

2.11.2 Design Submission Programme

- 1) The Contractor shall prepare the Design Submission Programme (for Design Phase and Construction Phase) which is to set out fully the Contractor's anticipated programme for the preparation, submission by the Contractor and review of the Design Packages, the issue of Notices by the Authority's Engineer for all stages of design. The Design Submission Programme shall cover all submissions during the Design Phase and the Construction Phase.
- 2) The Design Submission Programme shall:
 - (a) be deemed to comprise part of the Contractual Construction Programme and be in any case consistent and comply with all relevant Coordination Dates in the latest Contractual Construction Programme;



- (b) identify dates and subjects by which the Authority’s Engineer's response shall be made;
 - (c) make adequate allowance for periods of time for review by the Authority’s Engineer as specified in Article 10 of the EPC Agreement to the Authority 's Requirements and for the review of other bodies, if necessary;
 - (d) clarify correlations by identifying, describing, cross-referencing and explaining the various Design Submissions including multiple submissions of the design for the different Work Segments;
 - (e) make adequate allowance for the design and development of the specialist works/ Subcontractor works
 - (f) Indicate the interfacing design activities in respect of each of the Other Contractor / Interfacing Parties and external related parties and
 - (g) Shall meet the requirements as specified in Article 10 of the EPC Agreement.
- 3) The Contractor shall submit the Design Submission Programme to the Authority’s Engineer within forty-five (45) days after the Appointed Date, and thereafter up-dated versions thereof at intervals of not more than one (1) month throughout the Design Phase. Such updates shall be included as an exhibit in the Contractor's Monthly Progress Report.
- 4) The Contractor shall submit complete set of documents requested by any Indian legislation, as well as consented As Built Documents and certificates for conclusion of any legislative procedures
- 5) General requirements which are applicable to the Design Submission Programme are described in Article 11 of the EPC Agreement to the Authority's Requirements.

2.11.3 Calculations

- 1) Unless otherwise required by the Authority’s Engineer, calculations shall be submitted together with the respective Design Package submissions.
- 2) A comprehensive set of calculations for the whole of the Technical Design and the Construction Design and Technical Drawings / Construction Drawings (in the form acceptable to the Authority’s Engineer) shall be submitted by the Contractor to the Authority’s Engineer for consent as part of the relevant submittals.

2.12 Design Criteria

2.12.1 General

The design of the Works shall comply with the relevant Indian Railway standards, Codes, Specifications, manuals , rules and guidelines as published by Indian Railways /RDSO, Indian Standards, Indian Road Congress (IRC)



codes, CPWD Specifications and specifications and other International codes as specified and as applicable, and with the consent of the Authority’s Engineer. The Design Criteria shall be read in conjunction with the Specifications and other documents forming part of the Contract.

2.12.2 Alignment

A) Horizontal Alignment

- (1) The minimum radius shall be as per approved “L” Section.
- (2) For reverse curves, it is preferable to maintain a radius of 875 m or greater to enable application of long welded rails.
- (3) The actual radius of both the tracks shall remain the same. This will be achieved by shifting the center of the curve suitably.
- (4) Minimum length of straight length between adjacent curves:
 - (a) Desirable: 50m. In cases, where there is space constraint, both transitions can meet each other by suitable extending the lengths ensuring that rate of change of cant and versine along the two transitions so extended is kept the same.

B) Vertical Alignment

- (1) Vertical curve shall be provided only at the junction of two grades where the algebraic difference in change of grade is equal to or more than 0.4%.
- (2) If a vertical curve is adopted, its radius shall be minimum 4000 meters.
- (3) Vertical curves shall not coincide with horizontal transition curves but could coincide with circular curves.
- (4) Vertical curves shall not coincide with point and crossing work.

C) Gradients

The Ruling Gradient on the project is 1 in 300 i.e. 0.333% (Compensated). The limits for Ruling Gradient shall be as follows:

- (i) Maximum gradient for the Main Line : 1/300 i.e. 0.333% (Compensated)
- (ii) The maximum gradient shall be reduced by considering the curve compensation. The curve compensation shall be defined as follows:

Curve Compensation = $70/R$ [%] Where R: Horizontal curve radius [m]

- (iii) No change of Gradient in transition curve and within 30m of any points and crossings



- (iv) The approaches of all "Important Bridges" shall preferably be level for 100m from the abutments. If for any constraint of unavailability of adequate space, the same can be reduced with the consent of the Authority's Engineer with the approval of the Authority.
- (v) In case of other "Major bridges", there shall not be any change of gradient within 40m from either of the abutments. Only in very exceptional cases, like in flyovers, change of gradient on the bridge can be permitted by the Authority's Engineer with the approval of the Authority.
- (vi) The gradient in yard shall be 1 in 1200 or flatter. In unavoidable geometric design compulsion, steeper gradient shall be provided with the written approval of Authority Engineer with the approval of the Authority

D) Track Structure:

TABLE: Technical Parameters of Track Structures

S.N.	Technical parameter	Value
1	Gauge	1676 mm(BG)
2 (a)	Rails for main line and points and crossings	UIC60KG,90 UTS / R260 Rail Panel
2 (b)	Rails for other than main line (i.e., for loop lines, non-running lines, sidings, connecting lines)	60 Kg new rails for passengers loop lines andfor other lines 60 Kg 2nd Hand Rails
2 (c)	Guard rails	60 kg released rails (2 nos. for each track) forimportant bridges, Major bridges, RFOs, RUBsand for tracks under ROBs
3	Points and crossings	
3.1	Main line and running loops	1in 12 curved thick web switches 60Kg with weldable CMS crossings on PSC sleepers layout (In straight portion) 1in 12 curved curve switches 60 Kg with weldable CMS crossings on PSC sleepers layout (in Curvature) <i>Note: Canted turnout with thick web switch must be used in main line at all suitable location.</i>
3.2	Minor loop lines and non-running lines/sidings	1in 8 ½ curved thick web switches 60 Kg with weldable CMS crossings on PSC sleepers layout. (In straight portion) 1 in 8 ½ curved Curve switches



S.N.	Technical parameter	Value
		60 Kg with weldable CMS crossings on PSC sleepers layout. (In Curvature)
3.3	Main lines, Loop lines & Connecting lines	LWR track as per Railway Manuals.
4	Check Rail clearance and level crossings	
4.1	Minimum	51 mm
4.2	Maximum	57 mm
5	Minimum depth of space for wheel flange from rail level	38 mm
6	Ballast cushion below the bottom of sleeper at the rail seat	
6.1	Main line and connecting lines	350 mm (minimum)
6.2	Passenger Loop lines	300 mm(minimum)
7	Sleeper	PSC 60 kg wider base with 1 in 20 cant for the rail seat. The rail seat for PSC sleeper will be able to cater to 60 kg/m and 52 kg/m rail sections by providing suitable liners
7.1	Sleeper for steel bridges	H-Beam Sleeper
8	Sleeper density (No. of sleepers per km)	
8.1	Main line and connecting lines	1660
8.2	Loop lines and sidings	1660
9	Fastening	Elastic rail fastening
10	Formation width (with minimum center to center distance of tracks as 6.5 m)	
10.1	Embankment & Cutting(excluding side drains)	a) for double track- 13.16 m b) for single track- 7.85 m

E) For Track Structure on Steel Bridges,

The following additional parameters shall be adopted:

- Longitudinal profile of the Rails: Open web girders of 30.5m and above are provided with camber. The tracks on these girders are to be laid correctly following the camber of the girder.
- Rail cant: the rails on the bridge should be laid with an inward cant of 1 in 20 by continuing the same cant as on the approaches.
- Guard Rails: Guard rails should be provided on all Steel Girder bridges including the bridges with ballasted deck in terms of Para 275



of IRPWM. A typical arrangement of guard rails, with important dimensions are shown in sketch below.

Particular	Sketch reference dimension	Length
Clearance between G/Rail & Running rail	“a “	250+/-50 mm
Length of G/Rail outside ballast wall	“L1”	1825 mm
Length of G/Rail to be sent and brought together at middle of track	“L2”	4875 mm

The top table of the Guard Rail shall not be lower than the Running Rail by more than 25 mm.

- (d) H-BEAM sleepers suitably designed for 25 MT axle load moving at maximum speed of 160 Kmph shall be used for non-ballasted steel girders as per RDSO drawing.

2.12.3 Earthwork Design

2.12.3.1 For design of the embankment/earthwork the "Guideline and Specification for Design of Formation for Comprehensive guidelines and Specification for Railway Formation specification No. RDSO/2020/GE: IRS-0004, Sept.-2020", issued by RDSO will be followed. However, the following points shall be noted.

- (1) Formations comprises of granular layer (Blanket) over prepared sub-grade/top layer of embankment fill and embankment fill;
- (2) Cross fall slope to be at least 1:30 or 3% with tolerance of 0.5%;
- (3) Parameter of blanket of (550mm thickness minimum) as specified in the RDSO Specifications are mandatory provisions to be adopted;
- (4) Cess width shall not be less than 900mm ;
- (5) It is incumbent on the Contractor to identify the soft ground/BCS sub-soil locations as a first step of starting the work and take up the earth work on priority at such locations, so that maximum settlement takes place before "Integrated testing and commissioning".

2.12.3.2 Geometric Parameters and Design Principles

- (a) The following table specifies the geometric parameters with regards to Earthwork Structure of project, wherever required.

Table: Geometric Parameters of Earthwork



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.N.	Parameter	Value
1	Formation width (with minimum center to center distance of tracks as 6.5 m) (For track centers greater than 6.5m, the formation width shall be increased proportionately) (a) Embankment and cutting	1) Double track- 13.160 m 2) Single track- 7.850 m
2	Slope gradient for embankment	2H:1V
3	Slope gradient for cut (general)	1H:1V
4	Thickness of blanket	As per guidelines “Comprehensive guidelines and Specifications for Railway Formation specification No. RDSO/2020/GE: IRS- 0004, Sept.- 2020” (550 mm thickness will be kept)
5	Thickness of prepared subgrade	As per guidelines“Comprehensive guidelines and Specifications for Railway Formation specification No. RDSO/2020/GE: IRS-0004, Sept.- 2020”
6	Width of berm	1500 mm (minimum)
7	Width of cess (a) Embankment and cutting	900 mm (minimum)
8	Cross slope at top of blanket	1:30 or 3% with tolerance of 0.5%
9	Cross slope at top of prepared sub grade	1:30 or 3% with tolerance of 0.5%
10	Cross slope at top of embankment fill	1:30 or 3% with tolerance of 0.5%
11	Cross slope at berm	1:30 or 3% with tolerance of 0.5%

- (b) Design Principles of Earthwork: RDSO's guidelines “Comprehensive guidelines and Specifications for Railway Formation specification No. RDSO/2020/GE: IRS-0004,Sept.-2020.

2.12.4 Railway Bridges

2.12.4.1 Design Criteria :-

Bridge schemes shall remain as approved by Authority Engineer. Design of Bridge structures shall be in confirmation with Bridge manual, substructure code, RDSO drawings and other guidelines of the Railway.



On the basis of various tests and their results Contractor shall submit the Design Basis Reports for all the structures and get them approved from Authority Engineer. After approval of Design Basis Reports from Authority Engineer the detailed Designs of all minor bridges, major bridges, water canal crossings, Limited Height Subways (LHSs), Road Over Bridges (ROBs), Road Under Bridges (RUBs) and all works/structures required to be designed shall be done in accordance with various codal and manual provisions as stipulated in the Contract. All the designs shall be proof checked from approved proof consultant and submitted to Authority Engineer within the specified period of time schedule as per clause- 10.2 (Article-10).

2.12.5 Wayside Signs

The Contractor shall design and install the Wayside Signs in accordance with the requirements as specified in relevant IRS Codes and Manuals. The list of the Wayside Signs indicated herein below and in the Reference Drawings is not exhaustive and the Contractor shall provide all the Wayside Signs as per the IRS Codes and Manuals as applicable. Details of these signs shall be developed and submitted to the Authority’s Engineer as part of the Technical Design for consent. The Contractor shall take into account the visibility of the signs (in particular by the locomotive drivers); their stability (support post and foundations); durability and maintenance aspects. Design of reflective-type signs, incorporating clear numerals, located on non-corrosive supports, with parallel and perpendicular to the track as indicated in the Reference Drawings shall be developed in accordance with the requirements of relevant IRS Codes and Manuals.

- (1) Bridge Number Plaque: Bridge number plaques showing the bridge number which shall be embossed onto a metal plate or similar shall be attached diagonally on the top surface of the both abutments as indicated in the Reference Drawings.
- (2) Inscription Plaques on Bridges : Inscription plaques on all bridges of span 3.0m and above showing nature and depth of foundations shall be inscribed on cement concrete or stone slab fixed on each pier and abutment as per Indian Railway Bridge Manual para 1103.4 .
- (3) Flood Gauges: Flood gauges with marking of danger level and HFL shall be painted on each of the abutments and every fourth pier in case of multi-span bridges as per IRS Manuals.
- (4) Project Sign Boards
- (5) Any other board as per the requirement of relevant IR codes/manuals



3 Latest Version

Latest version of the Manuals, Specifications and Standards including the amendments notified/published by the Base Date shall be considered applicable.

4 Terms used in Manuals

The terms ‘Inspector’, ‘AEE/AXEN’, ‘DEN/XEN’ used in the Manuals shall be deemed to be substituted by the term “**Authority Engineer**”; to the extent it is consistent with the provisions of the Agreement.

5 Absence of specific provision

In the absence of any specific provision on any particular issue in the aforesaid Manuals, Specifications, or Standards, the following standards shall apply in order of priority Bureau of Indian Standards (BIS) Euro Codes or British Standards or American Standards Any other specifications/standards proposed by the Contractor and reviewed by the Authority Engineer.

6 Alternative Specifications and Standards

- 6.1 The requirements specified in the Manuals are the minimum. The Contractor shall, however, be free to adopt international practices, alternative specifications, materials and standards to bring in innovation in the design and construction provided they are better or comparable with the standards prescribed in the Manuals. The specifications and techniques which are not included in the Indian Railway Manuals/ RDSO specifications shall be supported with authentic specifications and standards specified in paragraph 5 above. Such a proposal shall be submitted by the Contractor to the Authority Engineer. In case, the Authority Engineer is of the opinion that the proposal submitted by the Contractor is not in conformity with any of the international standards or codes, then he shall record his reasons and convey the same to the Contractor for compliance.
- 6.2 In case, the Contractor is offering an alternative product which is not as per the designs/specifications stipulated in this Agreement, but the same is already in the use with satisfactory performance in one or more major world Railway(s) for more than 5(five) years for the same or higher design speed/rating (as applicable for project line), such product can be permitted to be used by the Authority Engineer in accordance with the Cross Approval policy of the Railway Board as existing at the time of offering of such product. The products covered for the purpose of this clause shall be as per the list provided in the policy.
- 6.3 **CROSS ACCEPTANCE CRITERIA will be applicable as per RDSO INSTRUCTION No.TI/IN/0044 Rev.00**



Wayside Signs:

The Contractor shall design and install the Wayside Signs in accordance with the requirements as specified in relevant IRS Codes and Manuals. The list of the Wayside Signs indicated herein below and in the Reference Drawings is not exhaustive and the Contractor shall provide all the Wayside Signs as per the IRS Codes and Manuals as applicable. Details of these signs shall be developed and submitted to the Authority’s Engineer as part of the Technical Design for consent. The Contractor shall take into account the visibility of the signs (in particular by the locomotive drivers); their stability (support post and foundations); durability and maintenance aspects. Design of reflective- type signs, incorporating clear numerals, located on non corrosive supports, with parallel and perpendicular to the track as indicated in the Reference Drawings shall be developed in accordance with the requirements of relevant IRS Codes and Manuals.

6.4 SSP Name Board:

SSP Name Boards (which shall be provided at SSP Building) on which the name of the SSP shall be embossed on to a metal plate, or similar shall be placed at the both Entrance Gate/fencing of SSP and shall comprise a metal plate, a metal frame supported on steel posts, or similar as indicated in the Reference Drawings. The Name shall be written in English and Hindi.

7 Contractor's Organization during Construction Phase

7.1 Project Organization Plan

- (a) The Contractor's Personnel shall be deployed and maintained as per the requirement at site. The Contractor's Superintendence shall be also properly deployed and maintained to carry out the construction activities.
- (b) The Contractor shall submit an updated Project Organization Plan which includes complete project organization chart during the Construction Phase adding functions and personnel necessary to perform the Works during the Construction Phase. This plan shall be updated and resubmitted whenever there are changes to the staff and /or the organizational structure. The plan shall show the management structure and state clearly the duties, responsibilities and authority of key staff member.
- (c) Full details regarding qualification and experience in respect of all the key staff shall be submitted to the Authority’s Engineer for his consent, If the Authority’s Engineer asks (in writing) the contractor to remove a person of his work force stating the reasons the Contractor shall ensure that the person leaves the Work Area within seven days and shall have no further connection with the Works in the Contract. The Authority’s Engineer shall also seek prior consent of the Authority in this regard.



- (d) During the Construction Phase, the Contractor shall maintain the Design Team in his organization independent of the Construction Team to deal with his design development including the Variation and changes to his design.

7.2 Requirements During Construction Phase

- (a) The principal requirements relating to the Contractor's Documents during the Construction Phase are the submissions by the Contractor of the followings:
 - i) Working Drawings and Documents,
 - ii) the technical submissions as required under the Contract,
 - iii) the compilation of the multiple design submissions for the different Work Segments and submission of the final design with related documentation and the submission of the As-Built Drawings / Document.
- (b) Working Drawings and Documents shall be prepared as required under the Contract.
- (c) The Contractor shall endorse the Working Drawings and Documents as being in accordance with the Technical Drawings which have received "Notice of No Objection" or "Notice of No Objection with Comments" from the Authority's Engineer after the comments duly resolved.
- (d) The Contractor shall endorse the submissions required under the contract that "all effects of the designs comprising the submission, on the design of adjacent or other parts of the works have been fully taken into account in the design of these parts".
- (e) The Contractor shall submit the Construction Design and Drawings as specified.
- (f) The Contractor shall maintain all records necessary for the preparation of the As-Built Drawings and Documents.
- (g) Upon completion of the Works or at such time as agreed to or required by the Authority's Engineer, the Contractor shall prepare drawings which, subject to the Authority Engineer's agreement, shall become the As-Built Drawings and Final Documents.
- (h) All such drawings and documents shall be endorsed by the Contractor as true records of the construction of the Permanent Works and of all Temporary Works that shall remain on the site.
- (i) The Contractor shall maintain all records necessary for the physical and financial completion and commissioning. These records shall consist of as a minimum:



- i) The implemented work according to activities, places and price; and
 - ii) Used materials - type, name of manufacturer along with batch No., place & price;
- (j) Prior to the commencement of construction operations, the Contractor shall obtain all necessary clearances from the concerned Authorities.
- (k) Contractor shall take all measures and precautions to ensure that the construction activities do not cause any infringement to the operations and maintenance of Indian Railways. Any construction activity involving the existing embankment/formation of the Indian Railways shall be permitted only with specific authorization by the Authority’s Engineer with the approval from Authority and Indian Railways.

8 Conceptual Method Statement and Sequence of Working (Working Methodology) in connection with Paniahwa-Madhubani New Line Project:

The method statement and sequence of working given here is indicative and for the guidance of the Tenderer only. The brief tentative method statement and sequence of working is described below:

The project work has to be completed and commissioning of the entire section is to be done within the timeline given in the contract. The decision to commission a section shall be taken by authority depending on progress of work. The various activities, but not limited to, involved in execution of the project as under:

(1)	GENERAL WORKS
a	Mobilization at work site
b	Taking over the Land and work site
c	Detailed survey
d	Soil investigations & collection of other data
e	Design of Structures
f	Leading of Permanent Way (P-Way) material
g	Execution of construction works at site
h	Safety at Work Site
(2)	CIVIL WORKS
a	Dismantling of Existing rack Structure, Bridges and other Miscellaneous Structure as decided by Authority.
b	Construction of Major Bridges, Minor Bridges, Limited Height Subway (LHSs)/Road Under Bridge (RUBs).
c	Construction of formation (Earthwork and blanketing)
d	Construction of Building/Structures
e	Track laying and linking
f	Extension & diversion of Level crossings
(3)	COMMISSIONING OF PROJECT
	After completion of all the works, the project shall be commissioned after obtaining Commissioner of Railway Safety (CRS) sanction and compliance of observations.



Contractor shall prepare all relevant documents in soft copies and hard copies as per requirement.
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8.1 General works

(a) Mobilization at work site

The agency shall mobilize at site the required resources like labour, material, rest shelter, site lab, site offices, machinery and all other necessary resources within the period as stipulated in the Tender clause-11.3 (Article-11)

(b) Taking over the land (95%) and work site

The agency shall take over the land (minimum 95%), work site, existing structures and all other assets required for start of work as per Contract stipulations. Joint survey over the entire stretch shall be done to assess and recording the details of all the features and structures shall be done before taking over the site and land for work. Balance land shall be taken over by the Contractor within 180 days of appointed date as per clause-8.2.3 (Article-8).

(c) Detailed survey

After taking over the site and land, Contractor shall conduct the detailed survey of the site, collecting data, (overhead, surface and underground data) for various structures, assets and data required for planning, designing and execution of works. Some indicative activities are, fixing of points on ground i.e. fixing the centre line pegs/points, km stones, Temporary Bench Mark (TBM) reference level and fixing the reference points on ground for all the required and obligatory points. Selection of resources/borrow pit areas for earth and section of sources for blanketing material and other construction materials. Identification of stack area for ballast, Permanent Way (P-Way) materials, construction materials, machineries & equipments, labour.

(d) Soil investigations & collection of other data

Contractor shall conduct the necessary soil investigations and other tests at required locations to determine the various design parameters for all the structures. Some relevant indicative activities are (but not limited to):-

- i) Collection of soil samples, boreholes, soil exploration, plate load tests/initial pile load test, testing of disturbed and undisturbed soil samples and determination of the bearing capacity of soil shall be undertaken.
- ii) Ascertaining various Design parameters for design of all structures of project.



- iii) Finalization of concrete mix design sources/make of various raw materials, earthquarry and finalization of other parameters for all construction activities.

(e) Design of Structures

On the basis of various tests and their results Contractor shall submit the design basis reports for all the structures and get them approved from Authority Engineer. After approval of design basis reports from Authority Engineer the detailed Designs of all structures like earth work formation, major bridges, minor bridges, Road Under Bridges (RUBs), buildings & structures, Level crossings and all other works/structures required to be designed shall be done in accordance with various codes and manual provisions as stipulated in the Contract. All the designs shall be proof checked from approved proof consultant and submitted to Authority Engineer within the specified period of time schedule as per clause- 10.2 (Article-10). Work at site should only be started after final approval of detailed design of the structure. The design of Formation with blanketing layer and subgrade and embankment fill design including thickness and type of soil to be used shall be submitted & got approved from Authority Engineer. In this regard, the table given above in clause 2.8.3.2 Geometric Parameters and Design Principles should be followed for formation design.

(f) Procurement, fabrication & manufacturer of P.Way material and fittings

The Rails for linking of track shall be provided by Authority (Railways).

Contractor shall plan to lead the railway supplied Permanent Way (P-Way) materials such as all type rails (New/SH). New Rails panel (260 m long rail) shall be transported through Departmental Material Trains (DMTs) and the Contractor has to unload, shift and stack the rail panels as per Railway Permanent Way (P-Way) specifications/Manuals.

The P.Way material & fittings shall be procured from RDSO approved firms only and testing, checks and approval as prescribed by RDSO/ Railways. The successful bidder should assess and procure the actual requirement as per survey and approved drawings after the work is started.

Procurement of ballast and loading, unloading and stacking the ballast at site, as per ballast stacking plan and as per railway specifications. Testing of ballast supply shall be done as prescribed in specification for railway ballast and got approved from Authority Engineer. The stacking of ballast at site shall be done in a pattern that there would not be any hindrance to any of the construction activity.

(g) Execution of construction works at site



After approval of design and drawings, the construction activities of various works involved in execution of the project shall be started at site as per schedule. Broadly, the works can be categorized into following groups:-

- i) The works which are away from existing railway tracks and in no way can affect the running trains, such works will hereafter be referred to as “**works under normal conditions**”.
- ii) The works which can only be executed in temporary suspension of railway traffic & power block for a pre-approved scheduled time period (traffic cum power block), such works shall hereafter be referred to as “works under block”.
- iii) The works which can be executed under restricted speed (caution) of railway traffic for a pre-approved scheduled time period; such works shall hereafter be referred to as “**works under speed restriction**”.

i) Works under Normal conditions

The construction works such as Earthwork, Blanketing, Ballasting, laying of tracks in the block section, Construction of minor bridges, RUB's, LC, construction of duty bunk and gate lodges which are located away from existing track, running trains and site is clear as per the Indian Railway Schedule of Dimensions (IRSOD) provisions i.e. where the safety of railway traffic is not affected. However, such works may involve the safety of other railway assets (other than running trains, track), non-railway assets (private/public), road traffic, workmen & machinery at site, general public for which Contractor shall take due care as per various safety conditions laid down in the Contract in specific and various other prevailing safety norms/practices in general.

ii) Works under Block

The construction works to be executed on or in vicinity of running track such as track works, Before Non-Interlocking (BNI) & Non-Interlocking (NI) works, insertion of Reinforcement Cement Concrete (RCC) boxes in existing line. Such works shall be done under block of specified duration duly sanctioned by railway authority. The works under block shall be completed within the permitted block period and track/Over Head Equipment (OHE) shall be made fit for train movement on or before the schedule completion of block time. The planning and methodology of such works and block requirement shall be submitted to Authority Engineer in advance as per clause 11.3 of Contract agreement. Authority may permit, amend or reject the block requirement as per the prevailing conditions and existing practices for executing similar works. Contractor has to plan the required block durations within the specified aggregate block hours specified in relevant schedule of Contract. Blocking or suspension of even a single line in yard will also be considered as block. It shall be ensured that the individual sanctioned block should be cleared within time. Block bursting if any will subject to penalty as per prescribed conditions of the Contract.



iii) Works under Speed restriction

All works in close proximity to existing track and locations affecting the safety of track & moving trains such as box pushing, attention to existing track, preparatory works before block and post block attention to track shall be executed under restricted train speed conditions. The detailed planning specifying the speed restriction for required duration will be submitted by the Contractor in the same manner as specified for block in Contract. Authority may permit, amend or reject the Speed restriction (SR) requirement as per the prevailing conditions and existing practices for executing similar works. Contractor shall ensure completion of work at site within the permitted duration of imposed speed restriction and track shall be made fit for normal train movement as per the sanctioned schedule. Contractor shall plan the required speed restriction duration within the specified aggregate speed restriction period allowed for completion of project. Contractor shall arrange to complete all works within the permitted speed restriction schedule.

(h) Safety at Work Site

The Contractor and its sub-Contractors shall follow the safety instructions and take all safety measures for Existing structure, Running Track, Public, workmen and vehicles plying in the work area in accordance with Railway Boards and Railways instructions, other applicable laws, Good Industry Practice and the provisions of this Agreement. The Safety instructions from the Railway administration communicated through Authority Engineer in form of Safety Circulars must be strictly followed by the Contractor as per Clause-3.10 (Article-3).

8.2 Civil works

(a) Construction of formation (Earthwork and blanketing)

After approval of formation design and field trial embankment, the earthwork shall be started at site. The earthwork shall be executed with the approved quality of earth and approved source of borrow pits. The earthwork shall be done in layers as per RDSO guidelines.

The blanketing material shall be laid in layers of specified thickness with approved quality of blanketing material from approved sources, compacting to required Maximum Dry Density (MDD) conducting the field and lab tests and approval from Authority Engineer. The earthwork and blanketing work shall be done as per laid down specifications and according to latest guidelines of RDSO for earth work in Railway Projects. The slopes shall be dressed to required profile and shall be done as per approved design of formation. Slope stability analysis may be required to be done which has to be conducted as per the provisions of the RDSO specification All earthwork



shall be executed as per the Guidelines issued by RDSO vide letter No.GE/GEN/ 185- Vol-I Dtd.17.09.2020 i.e. Comprehensive Guidelines and Specifications for Railway Formation –Specification No. RDSO/2020/GE: IRS-0004, Sept-2020.

The earthwork shall be started at site by removing all derbies, spoils, loose soil, undesired soil to required level, cutting and benching of slopes of existing formation as designed, providing safety arrangements to the existing cut out portion of formation by using the proper and approved protection arrangements, ensuring safety of men, material, machinery, road/rail users moving trains, railway assets and all other assets at site. Compaction of the earthwork should be done by deploying mechanical compactors and only in exceptional circumstances with the approval of Authority Engineer, manual compaction can be allowed.

The earthwork in general shall be done under normal conditions; however, at some locations close to track and locations affecting the safety of track & moving trains, the work shall have to be done under speed restriction taking proper safety measures.

Turfing of the slopes of the bank has to be ensured along with the construction of the trolley refugees at the specified distance as per IRPWM. Trolley refugees have to be properly dressed / finished and side slopes should be turfed.

(b) Construction of Major & Minor bridges

After approval of design and drawings of bridges, the construction of bridges shall be started at site in accordance with approved execution plan. The work shall be started side by side with the execution of earthwork and blanketing work in the section. The execution of bridges shall be done at in the following sequence of activities:-

i) Works under Normal conditions

The construction works on major & minor bridges shall generally be executed at locations away from running track as per provisions of Indian Railways Schedule of Dimensions (IRSOD) and where the safety and movement of running track is not affected.

- [1] Layout of bridge at site as per approved plan.
- [2] Provision of safety arrangements at site.
- [3] Diversion of water course if required, as per approved plan.
- [4] Excavation of bed to required level as per plan.
- [5] Casting of Reinforced Cement Concrete (RCC) bed, walls, slabs, foundations, substructure and super structures and wing walls as per approved design and drawings.



- [6] Testing the concrete cubes samples as per specification.
- [7] Removal of shuttering, shoring and staging after the due period.
- [8] Removal of loose materials, debris from site and diversion of main course of water way from already decided location.
- [9] Construction of approaches of major & minor bridges with required and specified construction material to the required/approved specification.
- [10] Completion of major & minor bridges as per approved plan.

ii) Works under block

The construction work of minor bridges under existing track, if required, shall be executed under block protection with pre and post block speed restriction:

- [1] The pre-cast Reinforced Cement Concrete (RCC) box shall be casted as per approved design and drawing well before block day.
- [2] The Contractor shall arrange to submit launching scheme for approval of Authority Engineer describing in detail the quantum of each item of work involved and resources to be deployed i.e. men, material and machinery to execute the work within stipulated time frame. Details shall include the number/quantum of excavators, JCBs, Cranes, small track machines, tools and plants, workmen, consumables to be deployed at site for timely execution of work in block period,
- [3] Contractor shall deploy adequate men, material and machinery at site as per the approved scheme.
- [4] The Contractor shall arrange at least one stand by crane of same capacity as that of the working cranes. Also the cranes shall be of sufficient capacity as per approved scheme.
- [5] The Contractor shall also keep stand by excavators and other machineries whenever these are deployed for work at site. Site shall be protected by engineering fixed and hand signals and as per Railways guidelines.
- [6] Safety equipment for 25KV Over Head Equipment (OHE) will be arranged by Contractor and work under power block to be done as per guidelines.

iii) Works under Speed restriction

The construction work of minor bridges at locations such as in railway yards, in close proximity to running lines and works required after execution of



blocks, preparatory works before execution of block, and attention to track after execution of block and any other work where safety of railway track and traffic is involved shall be done under speed restriction conditions. The detailed planning specifying the speed restriction for required duration will be submitted by the Contractor in the same manner as specified for traffic block in Contract. Authority Engineer may permit, amend or reject the Speed Restriction (SR) requirement as per the prevailing conditions and existing practices for executing similar works. Contractor shall ensure completion of work at site within the permitted duration of imposed speed restriction and track shall be made fit for normal train movement as per the sanctioned schedule.

After completion of work the site shall be made clear of all loose materials, debris, tool and plants.

(c) Construction of Limited Height Subway (LHS)/Road Under Bridge (RUB)s

i) Works under Normal conditions

The construction works of Road Under Bridge (RUB)/Limited Height Subway (LHS) at locations away from running track, not infringing the provisions of Indian Railways Schedule of Dimensions (IRSOD) and not affecting the safety of running trains shall be executed during normal working conditions. Mainly the works on casting of thrust bed and Reinforced Cement Concrete (RCC) box segments, approach roads, sump wells and height gauges will be done in normal conditions. Some of the main activities are listed below:

- [1] Closing of roads on Level crossing (LC) and diverting the roads as per approved diversion plan. Providing proper Warning boards such as diversion boards at required locations and ensuring free movement of traffic on diversion routes.
- [2] Layout of works at site as per plan. Excavation of approaches and roads
- [3] Construction of thrust bed as per approved design and drawing.
- [4] Casting of Reinforced Cement Concrete (RCC) boxes as per approved design and drawings.
- [5] Construction of Reinforced Cement Concrete (RCC) base slabs and retaining walls as per approved design and drawings.
- [6] Providing wearing coat for roads as per approved design and drawings.
- [7] Provision of height gauges and covering sheds as per approved design and drawings.
- [8] Providing the drainage arrangement, drains and construction of wells as per approved drawings and design.



- [9] Providing protection of sides of earth cut, by sheet piles or by other suitable measures to protect existing Single Line.

ii) Works under Traffic and Power Block

The construction work of Road Under Bridge (RUB)/Limited Height Subway (LHS) to be done under the running lines in close proximity to running lines where safety of the trains gets hampered during execution of the work shall be executed under the block protection.

The construction work of LHS shall be done by Relieving Girder method shall be executed under block protection with pre and post block speed restrictions:

- [1] The pre-cast box shall be casted as per approved design and drawing well before block day.
- [2] The Contractor shall arrange to submit launching scheme for approval of Authority Engineer describing in detail the quantum of each item of work involved and resources to be deployed i.e. men, material and machinery to execute the work within stipulated time frame. Details shall include the number/quantum of excavators, JCBs, Cranes, small track machines, tools and plants, workmen, consumables (with standby arrangements) to be deployed at site for timely execution of work in block period,
- [3] Contractor shall deploy adequate men, material and machinery at site as per the approved scheme.
- [4] The Contractor shall arrange at least one standby crane of same capacity as that of the working cranes. Also the cranes shall be of sufficient capacity as per approved scheme.
- [5] The Contractor shall also keep standby excavators and other machineries whenever these are deployed for work at site.
- [6] Site shall be protected by engineering fixed and hand signals and as per Railways guidelines.
- [7] Safety equipment for 25KV Over Head Equipment (OHE) will be arranged by Contractor and work under power block to be done as per guidelines.

The construction work of Limited Height Subway (LHS) by box pushing method under existing track shall be executed under block protection with pre and post block speed restriction:

- [1] The pre-cast Reinforced Cement Concrete (RCC) box shall be casted as per approved design and drawing well before block day.
- [2] The Contractor shall arrange to submit launching scheme for insertion of precast Reinforced Cement Concrete (RCC) boxes by cut and cover method or protection sheets girders (PTW) or Restricted Height (RH) Girder method



or any other advance technique. In case of Box pushing the approval of Authority describing in detail the quantum of each item of work involved and resources to be deployed i.e. men, material and machinery to execute the work within stipulated time frame will be required. Details shall include the number/quantum of excavators, JCBs, Cranes, small track machines, tools and plants, workmen, consumables to be deployed at site for timely execution of work in block period,

- [3] Contractor shall deploy adequate men, material and machinery at site as per the approved launching scheme.
- [4] The Contractor shall arrange standby crane (min. 01) of same capacity as that of the working cranes and excavators. The cranes deployed shall be of sufficient capacity as per approved launching scheme.
- [5] Site will be protected by engineering fixed and hand signals as per the manual specifications and latest safety circulars.

Two or three Limited Height Subway (LHS) sites shall be taken at a time in a single block.

- [1] Layout of the Road Under Bridge (RUB)/Limited Height Subway (LHS) and protection girder as per approved plan and fixing the reference of all the obligatory points.
- [2] Place the protection plate/protection girder at prefixed location near the track as per launching scheme. The cranes of required capacity and stand by crane shall be placed at required locations as per approved launching scheme before start of work in block.
- [3] The traffic cum power block of approved duration at specified location shall be got sanctioned as planned before starting the work under block.
- [4] Removal of the track of specified length from location by use of the cranes and placing the same at predefined location.
- [5] Removal of earth and ballast under removed track to specified depth for required length and width as per approved plan and disposal of surplus earth clear of the site. Removed ballast shall be stacked clear of the site.
- [6] Excavation of approaches to be done at proper location as per approved plan. Removal and disposal of surplus excavated earth at specified and approved location. Dressing and levelling of cutting bed to required level.
- [7] Placement of protection girder at required location as per approved plan by using the deployed cranes. The lifting and placement of protection girder shall be done by observing the complete safety at site for all the railway and non-railway structures such as track, Over Head Equipment (OHE) poles/portals/ Over Head Equipment (OHE) wires, signals/signal gears and equipment's, buildings and structures and all other adjoining areas & assets.



- [8] Lifting and placing the removed track on protection girder and fixing the same to required line and level and making fit for train movement as per P-way specifications. Track shall be made fit for train movement under specified speed restriction i.e. 20 KMPH for Protection sheets girders (PTW) and 40KMPH for Restricted Height (RH) Girder.
- [9] Clearing all the tool and plants, machinery loose material clear off the track.
- [10] Clearance of imposed block well in time to restore the train traffic and removal of protection signals provided at site at start of block.
- [11] Same procedure shall be adopted for the work under block if the other method like provision of Restricted Height (RH) girder/Relieving girder or any other advance technique is adopted in place of protection plate for box pushing/placement.

iii) Works under Speed restriction

The pushing of the precast Reinforced Cement Concrete (RCC) boxes under the track as per approved pushing method shall be done under speed restriction of 20 KMPH for Protection sheets girders (PTW) and 40KMPH for Restricted Height (RH) Girder.

- [1] Pushing of precast Reinforced Cement Concrete (RCC) box under track by box pushing technique with approved method of pushing by ensuring the safety of track and structures. The pushing of the Reinforced Cement Concrete (RCC) box shall be done at required and specified rate of pushing as approved by Authority Engineer.
- [2] Packing of track to make it fit for normal speed.
- [3] Opening to road traffic after completion of approaches of Limited Height Subway(LHS) & other allied works.

(d) Extension & diversions of Level crossings

The work of extension & diversion of Level crossings (LCs) shall be done under running train conditions, work under speed restriction and work under traffic block conditions. The extension of Level crossings (LCs) work to be done with gate under working condition.

i) Works under Normal conditions

- [1] Dismantling of existing road and approaches.
- [2] Const. of foundations of new lifting barrier, of barrier and all other foundation required for extension of Level crossing (LC).
- [3] Fixing of new lifting barrier complete set as per drawing and design.
- [4] Construction of approach road as per approved plan and drawings.



- [5] Construction of fencing wall on Level crossing (LC) gate at new locations as per approved drawing.

ii) Works under Block

- [1] Disconnection with existing lifting barrier system and connection with newly fixed lifting barrier system
- [2] Construction of road surface within existing track and adjoining area of existing track.
- [3] Testing of newly connected lift barrier system
- [4] Dismantling of old lift barrier complete set.
- [5] Removal of all loose part, tool and plant, released material.

iii) Work under Speed restriction

Preparation of road surface in new line and area adjoining the existing running lane. After completing all the works, the Level Crossing shall be made fit in all respect and open to traffic. Road diversions already provided shall be removed. Road traffic diversion shall be cleared and normal road traffic shall be restored with road signage's as per IRPWM.

(e) Track linking

After laying and passing of formation & preparation of ballast bed, the track shall be linked as per provisions of Permanent Way (P-Way) manual. Track laying works includes the linking of track, Switch Expansion Joints (SEJ's), Check Rails, Guard rails. Track linking work and other Permanent Way (P-Way) works shall be done by using any suitable and safe method duly approved by authority's engineer. Further, at some of the location while transporting rails, sleepers and for taking tie tamping and other machines, necessary track connections will have to be made as per the directives of authority's engineer. The work of such connections is included in the scope of work.

(i) Works under Normal conditions

The track on new formation and other Permanent Way (P-Way) works on new formations generally done in normal working condition. The Permanent Way (P-Way) works for track linking shall be done in following sequence:

- 1) Levelling of newly laid formation as per approved L-section.
- 2) Staking the centre line and marking the ballast profile line on formation as per approved track geometry.



- 3) Spreading and rolling by light weight rollers of ballast on the formation to required thickness by any suitable mechanical method.
- 4) Laying of concrete sleepers on spread ballast at required spacing as per approved plan. The special set of sleepers for trap, Points and X-ings, Switch Expansion Joints(SEJ's) to be laid at required location as per approved drawings. Standard drawing for sleeper sets need to be followed for laying of the sleepers.
- 5) Placing of rail fixtures, Rubber pads as required as per approved Permanent Way(P-Way) drawings and Permanent Way (P-Way) manuals.
- 6) The rails shall be laid over the sleepers as per prescribed procedure and specifications of Permanent Way (P-Way) manual, CE circulars and other manuals to avoid any damage to Rails and Sleepers. In block section/Yard , track shall be initially linked with the loose service rails & SH rails (provided by Railway free of charge, on returnable basis for laying service track; same shall be used by contractor for laying entire service-track and returned back to Rly) properly connected through Fish Plated Joints. Manual packing shall be done to achieve the track parameters required for the movement of Rail Departmental Material Train (DMT) for unloading long-rail panels.
- 7) The Rail Departmental Material Train (DMT) will be received on this track from the nearest specified station, where the track linking will be done from the dead end of station/s or any other location as directed by Rly. Long rail panels upto 260 m length shall be unloaded from the Departmental Material Train (DMT) along the newly laid track. The track laid with service Rails shall be renewed with these Long rail panels. The released service Rails shall be leaded to another location for track linking, if required. After release of all Loose service Rails, these will be stacked properly at an identified location. The rails for Switch Expansion Joints (SEJs), check rails, guard rails, service rails, and other parts shall be laid as per approved standard plans and provision of PWay manual and latest guidelines.
- 8) Joining the rail joints with fish plates and fish bolts (with chamfering) on rail panels and points and crossing providing liners, Elastic Rail Clips (ERCs) to fix the rails with sleepers.
- 9) Alignment of rail, leveling of rails, sleeper and track to required line and level as per approved drawing and plans.
- 10) Flash Butt Welding shall be done by mobile plants for converting the 260 m Long rail panels and secondary rails in loop lines into Long Welded Rails (LWR)/Continuous Welded Rails (CWR) as per approved plans, specifications, Permanent Way (P-Way) manual and latest Railway Board Guidelines. Whenever Flash Butt welding is not possible such as Turnout area, SEJ's, Joints created for distressing, Single Shot AT welding as per manual provisions shall be done after approval of Authority. Ultrasonic Flaw Detection (USFD) testing of all welds shall be done as per manual



provisions. The welds found defective in Ultrasonic Flaw Detection (USFD), shall have to be replaced by the Contractor at his own cost.

- 11) Putting the ballast on shoulders and crib of the sleepers to the required profile for straight/curved track and point and crossings.
- 12) Packing of the ballast in the track manually and by track machines for no. of rounds as prescribed in track/ Permanent Way (P-Way) manual and specification.
- 13) Machine working on newly laid track to make it fit for train movement to the prescribed standard of Permanent Way (P-Way) manual. Track machines are available with Railway and can be hired by Contractor for use on track working as per requirement on payment of specified hiring charges. Parameters of the track to be achieved have to conform to Para 520 of IRPWM.
- 14) Profiling of track to required standard and removing the deficiencies if found before allowing the track for train movement.
- 15) In case of R260 rail panels, Agency has to follow all guidelines issued by the Ministry of Railways regarding handling, laying and welding (AT and MFBW) of R260 rails including compound joints with other rails.

(ii) Works under Block

The Bridge works, track linking works shall be done under traffic and power blocks wherever safety of the existing track is affected. Other works such as replacement of rail or track part i.e., sleeper, ballast, fittings and fastening in existing track and machine working on existing track shall be allowed under traffic and power block. The prescribed procedures for sanction of block from Railway and imposition of sanctioned block on track shall be properly followed.

- 1) Submission of Green Notice to Railway for sanction of block as required on specified date, time and duration.
- 2) Placing of ballast, sleepers, rails, fittings & fastenings and track to be laid as required at site as per approved planned Permanent Way (P-Way) manual/specifications. Linking of track by assembly all the parts of track and make it fit for operation/trains working as per Permanent Way (P-Way) manual specifications. Linking of newly laid track with existing track by welding or by providing fish plates as per approved drawing.
- 3) Removing the ballast deficiency by putting additional ballast on cribs and shoulders of track as per ballast profile.
- 4) Packing of track by track machines. Picking up slacks and deficiencies if available in track and making fit for train working.



- 5) Making track fit in all respect for train movement and clearing of sanctioned traffic cum power block. The passage of first and subsequent trains at specified speed on newly laid track shall be ensured as per prescribed procedure.

(iii) Work under Speed restriction

The Permanent Way (P-Way) work executed on new lines or an existing line situated on close proximity of moving trains and Permanent Way (P-Way) works where the safety of work hampers due to movement of trains at normal speed shall be done under speed restriction condition.

- 1) Acquire the sanction from railway authority for speed restriction at required location of track and for required location at required speed of train movement.
- 2) Imposition of speed restriction on track as sanctioned for the section.
- 3) Execution of various Permanent Way (P-Way) works as required during the imposed speed restriction period. Safety of train men, material, machinery and other assets to be ensured completely while working under speed restriction conditions by considering all safety rules and procedures.
- 4) Making track fit for train movement and removing the speed restriction imposed on track, Allowing for train movement at allowed speed. Before clearing the speed restriction all loose material, machinery, tools and plants, surplus filings and fastening shall be made clear off the track. Safety signals provided on the track shall be removed before allowing the passage of the train.
- 5) Contractor shall plan the duration of speed restriction for particular work within the allowed/ permitted consolidated Hrs. for imposition of speed restriction to complete the entire project. Bursting of sanctioned speed restriction duration for particular specific working shall be allowed.
- 6) Complete safety procedure shall be adopted during execution of work on and near the running track. The safety of men, material, machinery, Railway and non-railway assets, structures, track and moving trains shall be ensured as per prescribed safety rules and regulation. While working on and along/near the track under running train conditions.

(iv) NI working in Station Yard (for Phase Work)

- 1) All necessary prerequisite preparatory civil, building, track work, electric work shall be completed and complete mobilization of machineries, manpower, material and all resources to execute the pre-NI, NI and post NI works as committed in the joint program shall be made available to establish preparedness of the contractor for taking up the NI work well in advance.



- 2) Work to be carried out during NI such as dismantling, lifting, slewing, Glued joint, SEJ insertion and P&C of existing track and any other ancillary works may be encountered during NI working.
- 3) During NI period work shall be executed round the clock continuously i.e. day and night.
- 4) Contractor shall make provision of the temporary goomty (water proof) with seating arrangement i.e. table and chairs, water arrangement, food arrangement with lighting arrangement at the locations directed by the Authority Engineer for the purpose of the operating and other staff during NI and pre NI period.

8.3 Commissioning of Project:

The commissioning of this project is planned in a single phase as per completion of works.

9. Contractor's Coordination With Others

9.1. Interfacing Parties and Related Parties

The Contractor shall fully coordinate the design of the Works with Interfacing Parties, all relevant bodies, parties and entities, in particular government authorities, departments and regulatory bodies, utility companies, and the consultants, and contractors of adjacent projects whether ongoing or planned, as advised by the Authority's Engineer. The Contractor shall identify all such related parties, bodies and entities in his Interface Management Plan (IMP) and other relevant requirements.



Annex - I

(Schedule-D)

Specifications and Standards for Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the following manuals:

Equipment, materials and sub-systems (as required within the Scope of Works) shall be designed, manufactured and tested in accordance with the latest issue of consented /approved and recognized codes and standards defined and proposed by the Contractor and consented by the Authority's Engineer for the Work.

The Contractor shall submit Five original copies (latest publications in English) to the Authority's Engineer of all the Codes, Standards and Guidelines proposed to be used for the work including those listed in the Specifications out of which Two original copies shall be retained by Authority's Engineer and Three original copies shall be forwarded to the Authority for his use.

References to "standards or to materials and equipment of a particular manufacturer" in the Bid Documents shall be regarded as followed by the words" or better".

The Contractor may propose alternative standard materials, or equipment that shall be equal to or better than those specified and compatible with Specifications / requirements defined under the All Materials, works and construction operations shall conform to the following manuals:

1.1 For civil works:

1.1.1 General Guidelines for Civil works

- a. Earthwork in formation should conform to Guidelines issued by RDSO vide letter GE/GEN/185-Vol-I dated 17.09.2020–guidelines “Comprehensive guidelines and Specifications for Railway Formation specification No. RDSO/2020/GE: IRS-0004, Sept.-2020”. Only Mechanical Compaction of Embankment Fill with vibratory/sheep foot rollers as the case may be to suit the available, designed and approved soil should be resorted.
- b. Indian Railways Permanent Way Manual, Flash Butt Welding Manual, AT Welding Manual, Manual of Long Welded Rails, Manual for Ultrasonic Flaw Detection, On Track Machine Manual, Small Track Machine Manual, RDSO Specification & Drawings for P. Way& Works Materials with up to date Addendum & Corrigendum.
- c. Indian Railway Bridge Manual, Foundation & SubStructure Code of IR, IR Bridge, Rules, IRS Concrete Bridge Code, RDSO Spec.B1 2001 for



Structural Steel & IR Steel & welded Bridge Codes with up to date Addendum & Corrigendum Slips. The relevant IRS Specifications referred to in the above documents listed at (i), (ii) and (iii).

- d. CPWD Delhi Schedule of Rates 2021 (DSR- Vol I& Vol-2, DSR – Horticulture’s and landscaping) Analysis of rates (AOR- Vol. I & AOR Vol.II) and CPWD specifications (Vol.1 &Vol 2) for executing Civil Engineering works, Road works & Horticulture (except formation works, Bridge works and P.Way works) on Indian Railway. and specification of works of North Eastern Railway.
- e. Indian Railway Schedule of Dimensions with upto date Addendum & Corrigendum Slips.
- f. Indian Railway Track Manual Vol. I & II with latest Amendments.
- g. Indian Railway Construction Manual, All Relevant IS Codes for works & Materials.
- h. For specifications of Tunnel works kindly refer to Annexure-III of Schedule D. (Not applicable)
- i. Specifications of Works of concerned zonal railway.
- j. In case of any contradiction in the various codal provisions, the order of precedence shall be as follows:-
 - a. Provisions of this Annex I.
 - b. IRS Codal provisions
 - c. IRC Codal provisions
 - d. IS (BIS) Codal provisions
- k. The work shall be executed as per the Guidelines issued by RDSO vide letter No.GE/GEN/ 185- Vol-I Dtd. 17.09.2020 i.e. Comprehensive Guidelines and Specifications for Railway Formation – Specification No. RDSO/2020/GE: IRS-0004, Sept-2020.
- l. Railway Board Standardized Signage guidelines for Railway Stations letter No. 2023/SDII/22/07/02 Dt.15.05.2023.

1.2 For signalling and telecommunication works:

- (a) Indian Railway Signal Engineering Manual for signalling; and
- (b) Indian Railway Telecom Manual for telecommunication works.
- (c) Latest IRS / RDSO specifications



1.3 For electrification works:

- (a) Indian Railways Manual AC Traction, Volume-II Part-I and Volume-II Part-II.
- (b) Manual of Standards & Specification for Railway Electrification
- (c) Indian Railways Standards of Dimension
- (d) All latest Technical Advisory note/ guidelines issued by RDSO and Railway Board.
- (e) RDSO/Railway Board technical circulars/ Specifications/ instructions.
- (f) If RDSO approved vender is available for a material, then materials to be procured from RDSO approved firms with RDSO specification.
- (g) CEA Regulations.
- (h) Design Manual for Electric Traction Vol.-III Traction Over Head Equipment (RITES).
- (i) Any other EN, IEC, IEEE, UIC guideline relevant to Railway Electrification

2 Deviations from the Specifications and Standards

Notwithstanding anything to the contrary contained in Paragraph 1 above, the following Specifications and Standards shall apply to the Railway Project, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent set forth below:

[NIL]

Note: Deviations from the aforesaid Specifications and Standards shall be listed out here. Such deviations shall be specified only if they are considered essential in view of project-specific requirements.



Annex - IB
(Schedule-D)

REFERENCE DRAWINGS AND INSPECTING AGENCIES FOR P.WAY MATERIALS

S.N.	Item	Drawing No.	Inspection Agency
1	PSC main line Sleepers	T-8746	Zonal Railway/Consignee
2	ERC	T-5919	Consignee
3	CGRSP	T-8747	RDSO
4	Metal Liners	T-8748 to T-8750	TPI Agency
5	GFN Liners	T-8751 to T-8753	RDSO
6	PSC 1 in 12	T-4218	Zonal Railway/Consignee
7	TWS 1 in 12	T-6155	TPI AGENCY
8	CMS Xing 1 in 12	T-4220	RDSO
9	GRSP 1 in 12	T-4218	RDSO
10	PSC 1 in 8.5	T-4865	Zonal Railway/Consignee
11	Switch 1 in 8.5	T-4966	TPI Agency
12	CMS Xing 1 in 8.5	T-4967	RDSO
13	GRSP 1 in 8.5	T-6965/4865	RDSO
14	PSC DS	T-5836	Zonal Railway/Consignee
15	Derailing switch	T-6068	Consignee
16	GRSP DS	T-5836	RDSO
17	PSC SEJ	T-4149	Zonal Railway/Consignee
18	ISEJ	T-6922	TPI AGENCY
19	GRSP SEJ	T-4159	RDSO
20	ERC J	T-4158	Consignee
21	Glued Joints	T-5853	TPI Agency
22	Fish plates	T-1898	TPI Agency
23	Fish Bolts & Nuts	T-1899	TPI Agency
24	PSC Guard Rails	T-8970	TPI Agency
25	PSC Bridge approach	T-8971 to 8978	Zonal Railway/Consignee
26	PSC Curve sleepers	T-8621 to 8624	Zonal Railway/Consignee
27	Rail Screw	T-4153	TPI Agency
28	Plate screw	T-3912 and 3913	TPI Agency
29	Single coil washer	T-10773	TPI Agency
30	Fish plate 1M	T-5916	TPI Agency
31	Joggled FP	T-5849	TPI Agency
32	Combination FP60/52Kg	T-8533 to 8536 and 696 to 699	TPI Agency
33	SEJ Clamps	T-4168	TPI Agency
34	JFP with clamps	T-4016	TPI Agency
35	Any other P.way material	As per latest drawing	As per extant guidelines

** TPI - Third Party Inspection Agency

Please note: Inspection agencies may change during execution of work to comply with the latest prevalent RDSO guidelines or Railway Board's instruction.



Annex - II

(Schedule-D)

(See Clause 10.2.7(c))

Time Schedule for Review of Drawings by the Authority:

Sl. No.	Item	Preparation	Authority's Review with time limit	Review by Open Line/ RDSO
1.	Alignment plan	-	-	Approved copy enclosed with RFP.
2.	L Section	-	-	Approved copy enclosed with RFP.
3.	LWR Plans	Contractor	CE/C (45 days)	Copy to CTE to give remarks in 30 days, if any.
4.	Design basis report for important bridges	Contractor	CE/C (60 days)	CBE and RDSO to give remarks in 45 days.
5.	GAD of important bridges	Contractor	CE/C (45 days), CBE and RDSO to give remarks in 30 days	Contractor to submit GAD after clearance of design basis report.
6.	GAD of major and minor bridges, affecting the existing bridge (requiring load sharing or imposition of SR during construction)	Contractor	CE/C (45 days)	Copy to CBE to give remarks in 30 days, if any.
7.	GAD of major and minor bridges (without any reduction in waterway/ vertical clearance and not affecting the existing bridge)	Contractor	CE/C (30 days)	
8.	Structural drawings of important and major bridges	Contractor	CE/C (30 days)	
9.	Structural drawings of minor bridges	Contractor	Dy.CE/C (30 days)	
10.	GADs of RUBs	Contractor	CE/C or CE of Open Line and State Authority	Nil
11.	Structural Drawings of ROB/RUBs	Contractor	CE/C (30 days)	
12.	GADs of FOB	Contractor	CE/C (45 days)	Copy to CBE and DRM to give remarks in 30 days, if any.
13.	Structural Drawings of	Contractor	CE/C (30 days)	



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Sl. No.	Item	Preparation	Authority's Review with time limit	Review by Open Line/ RDSO
	FOBs			
14.	Engineering Scale Plans (ESPs)	-	-	Approved copy enclosed with RFP.
15.	Tentative Signal Interlocking Plans (SIPs)	-	-	It will be approved by the Railway
16.	Route Control Charts (RCCs)	Contractor	CSTE/C (14 Days)	Remarks to be given within one month of submission and approval by Railways to be furnished to the contractor within one month of submission of compliance of remarks by contractor.
17.	Cable Route Plan	Contractor	CSTE/C (45 days)	Remarks to be given within one month of submission and approval by Railways to be furnished to the contractor within one month of submission of compliance of remarks by contractor.
18	Interface and logic circuits (to be submitted within 30 days after receipt of approved RCCs).	Contractor	CSTE/C (30 Days for Both)	Remarks to be given within one month of submission and approval by Railways to be furnished to the contractor within one month of submission of compliance of remarks by contractor.
19	Station Working Rule Diagrams & Station Working Rules. (to be submitted within 21 days, after receipt of approved RCCs)	Contractor	CSTE/C (30 Days)	Remarks to be given within one month of submission and approval by Railways to be furnished to the contractor within one month of submission of compliance of remarks by contractor.
20	Technical System Approval for EI	Contractor	CSTE/C (30 Days)	Remarks to be given within one month of submission and



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Sl. No.	Item	Preparation	Authority's Review with time limit	Review by Open Line/RDSO
				approval by Railways/RDSO to be furnished to the contractor within one month of submission of compliance of remarks by contractor.
21	Track circuit and traction Bonding plan (to be submitted within 21 days, after receipt of approved SIPs)	Contractor	CSTE/C and CEE/C. (21 Days)	Remarks to be given within one month of submission and approval by Railways to be furnished to the contractor within one month of submission of compliance of remarks by contractor.
22	Power supply scheme (to be submitted 21 days, after receipt of approved SIPs)	Contractor	CSTE/C (21 Days)	Remarks to be given within one month of submission and approval by Railways to be furnished to the contractor within one month of submission of compliance of remarks by contractor.
23	Cable Core Plan, (to be submitted within 21 days, after receipt of approved SIPs)	Contractor	CSTE/C (21 Days)	Remarks to be given within one month of submission and approval by Railways to be furnished to the contractor within one month of submission of compliance of remarks by contractor.
24.	Building Plans	Contractor	CE/C or CE of Open Line and if require, State Authority	Nil
25.	Drainage Plans	Contractor	Dy.CE/C (30 days)	
26.	Protection Work Design and Drawings	Contractor	CE/C (30 days)	
27.	Panel Diagram (to be submitted after receipt of approved SIPs)	Contractor	CSTE/C (21 days)	Remarks to be given within one month of submission and approval by Railways



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Sl. No.	Item	Preparation	Authority's Review with time limit	Review by Open Line/ RDSO
				to be furnished to the contractor within one month of submission of compliance of remarks by contractor
28.	Signaling Plan for each interlocked station, including interlocked level crossings situated outside station limits and inter locked mid-section sidings.	-	-	Tentative copy enclosed with RFP.
29.	Selection Table for each EI/Relay Interlock Station	Contractor	CSTE (14 Days)	Remarks to be given Within one month of submission and approval by Railways, to be furnished to the contractor within one month of submission of compliance of remarks by contractor.
30.	Locking Table and locking diagrams for each Interlocking frames, station master's slide control, frame, interlocking key box, power frame with mechanical locking.	Contractor	CSTE (45 days)	Div./HQ of concerned Railway. (within 75 days to
31.	All other Signalling/ Telecom Drawings/ Designs	Contractor	CSTE (60 days)	Remarks to be given within one month of submission and approval by Railways, to be furnished to the contractor within one month of submission of compliance of remarks by contractor.

Note: - All other drawings/designs which are not mentioned herein will fall under the review of Authority Engineer (Dy. CEE/ Dy. CE/ Dy. CSTE as the case may be) and the time limit thereof will be as per the terms and conditions mentioned in the Contract Document.



Time Schedule for Review of Drawings by the Authority for electrification works:

Sl. No.	Item	Preparation	Authority's Review with time limit	Review by Open Line/RDSO
1.	Final Layout Plan based on Pegging Plan supplied by Railway	Contractor	CEE(C)/CPD/RE (21 days)	NIL
2.	Cross Sectioning Drawings	Contractor	CEE(C)/CPD/RE (21 days)	NIL
3.	Structure Erection Drawings	Contractor	CEE(C)/CPD/RE (21 days)	NIL
4.	Long Section drawings of OHE under over line structures and overhead crossings	Contractor	CEE(C)/CPD/RE (21 days)	NIL
5.	Other design and drawings where there are any deviation from RDSO standards	Contractor	CEE(C)/CPD/RE (15 days))	NIL
6.	As erected SED and CSD	Contractor	CEE(C)/CPD/RE (30 days)	NIL
7.	Any special arrangement, including bridge masts, FOB/ROB modification, or structural modifications.	Contractor	CEE(C)/CPD/RE (45 days)	CEE of the concerned Railway. CBE in case of bridge masts, FOB/ROB, engineering structure modification (CEE or CBE to review and return to CEE(C)/CPD/RE within 30 days)
8.	All PSI Drawings/Designs	Contractor	CEE(C)/CPD/RE (21 days)	NIL
9.	Relay setting calculation of TSS	Contractor	CEE(C)/CPD/RE (21 days)	Sr DEE (TRD) of concerned Division. (Review to be returned to CPM/RE within 14 days)
10.	HT Crossing and LT crossing modifications	Contractor	CEE(C)/CPD/RE (45 days)	Sr DEE(TRD) of concerned Division (Review and return to CPM/RE within 30 days).
11.	Bonding Plan of Yard Area	Contractor	CEE(C)/CPD/RE (28 days)	Sr DEE(TRD) of concerned Division (Review and return within 21 days to CEE(C)/CPD/RE)



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

12.	Locking Table and locking diagrams for each interlocking frames, station master’s slide control, frame, interlocking key box, power frame with mechanical locking.	Contractor	CSTE (45 days)	Divn/HQ of concerned Railway. (within 75 days to
13.	All other drawings not mentioned above, where mandatory review by Railway is necessary to comply with provision of Manuals/Codes.	Contractor	21 days where CPD/RE is approving Authority. 45 days where approval has to be taken from Open Line Railway.	As per the case.

Note: All other drawings/designs which are not mentioned herein will fall under the review of Authority Engineer (Dy. CEE/ Dy. CE/ Dy. CSTE as the case may be) and the time limit thereof will be as per the terms and conditions mentioned in the Contract Document.



SCHEDULE - E

(See Clause 3.1.6(a))

APPLICABLE PERMITS

1 Applicable Permits

1.1 The Contractor shall obtain, as required under Applicable Laws, the following Applicable Permits:

- (a) Permission of the State Government for extraction of boulders from quarry;
- (b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;
- (c) Licence for use of explosives;
- (d) Permission of the State Government for drawing water from river/reservoir;
- (e) Licence from inspector of factories or other competent Authority for setting up batching plant;
- (f) Clearance of Pollution Control Board for setting up batching plant;
- (g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;
- (h) Permission of Village Panchayats and State Government for borrow earth; and
- (i) Any other permits or clearances required under Applicable Laws.

1.2 Applicable Permits, as required, relating to environmental protection and conservation shall have been or shall be procured by the Authority in accordance with the provisions of this Agreement.



SCHEDULE - F

(See Clauses 7.1.1, 7.5.3 and 17.2)

FORM OF BANK GUARANTEE

Annex-I

(See Clause 7.1.1)

Performance Security

President of India,
Acting through Chief Administrative Officer/Construction,
N.E. Railway, Gorakhpur

Beneficiary: **FA&CAO/Con/N.E. Railway, Gorakhpur**

WHEREAS:

- (A)(insert name and address of the contractor) (hereinafter called the “**Contractor**”) and (insert name and address of the project authority), (hereinafter called the “**Authority**”) have entered into an agreement (hereinafter called the “**Agreement**”) for the construction of the new railway line between-..... in the Railway zone on Engineering, Procurement and Construction (the “**EPC**”) basis, subject to and in accordance with the provisions of the Agreement
- (B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period } (as defined in the Agreement) in a sum of Rs..... cr. (Rupees crore) (the “**Guarantee Amount**”).
- (C) We, through our branch at (the “**Bank**”) have agreed to furnish this bank guarantee (*hereinafter called the “**Guarantee**”*) by way of Performance Security.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor’s obligations during the {Construction Period/ Defects Liability Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the [mention Finance of Authority], upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.



2. A letter from the Authority, under the hand of an officer not below the rank of [***in the ***]Railway, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfilment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below



and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****\$. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

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



SCHEDULE – F

(See Clauses 7.1.1, 7.5.3 and 17.2)

Annex-I

(See Clause 7.1.1)

(Performance Security)

E- Bank Guarantee Bond from any scheduled commercial bank of India.

President of India,
Acting through Chief Administrative Officer/Construction,
N.E. Railway, Gorakhpur

Beneficiary: **FA&CAO/Con/N.E. Railway, Gorakhpur**

Date:.....

E-Bank Guarantee Bond No.:

Date:-----

Reference:- Contract No _____, **awarded on** _____.

WHEREAS:

- (A)(insert name and address of the contractor) (hereinafter called the "**Contractor**") and (insert name and address of the project Railway), (hereinafter called the "**Railway**") have entered into an agreement (herein after called the "**Agreement**") for [PGMS/PMS/PSS/GC] in the Railway zone, subject to and in accordance with the provisions of the Agreement.
- (B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period} (as defined in the Agreement) in a sum of Rs..... cr. (Rupees crore) (the "**Guarantee Amount**").
- (C) We,.....through our branch at.....(the "**Bank**") have agreed to furnish this e-bank guarantee (here in after called the "**Guarantee**") by way of Performance Security.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the [mention Finance Officer of the Railway], upon its mere first written demand, and without any



- demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Railway shall claim, without the Railway being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Railway, under the hand of an officer not below the rank of [***in the ***] Railway, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Railway shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Railway and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other Authority or body, or by the discharge of the Contractor for any reason whatsoever.
 3. In order to give effect to this Guarantee, the Railway shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
 4. It shall not be necessary, and the Bank hereby waives any necessity, for the Railway to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
 5. The Railway shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and / or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Railway against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Railway, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Railway of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Railway or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
 6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Railway in respect of or relating to the Agreement or for the fulfilment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.



7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Railway on the Bank under this Guarantee all rights of the Railway under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on ****\$. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Railway in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Railway that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Railway pursuant to the provisions of the Agreement.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank

by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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



e-BG towards Performance Security Challan for the e-BG

1. Challan reference:

IREPS Reference ID (Unique Reference Number)	<Some number to be automatically generated by IREPS>
Challan Date	DD.MM.YYYY <To be automatically fetched by IREPS>

2. Beneficiary Details:

Beneficiary Details	<The associate paying Railway for the tender issuing Railway. To be automatically fetched by IREPS>
Bank Details of the Beneficiary	xvi. Account Number xvii. Bank Name xviii. IFSC <To be automatically fetched by IREPS>

3. Tender Details:

Tender No.	<To be automatically fetched by IREPS> <Should not be edited by the Bank>
Tender closing date	<To be automatically fetched by IREPS>
Railway Zone	<To be automatically fetched by IREPS>
Railway Unit	<To be automatically fetched by IREPS>
Railway Department	<To be automatically fetched by IREPS>

4. Bidder Details:

Bidder Name	<To be automatically fetched by IREPS>
Bidder ID	<To be automatically fetched by IREPS>
Country of Registration of the Bidder	<To be automatically fetched by IREPS from the vendor master>
Nature of Constitution of the Bidder	<i.e. proprietor or company, etc. To be automatically fetched by IREPS from the vendor master>
Contact person	<To be entered by the bidder>
Contact number and email	<To be entered by the bidder>



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

5. Bank Details of the Bidder:

Details of the Bank in India through which the bidder wishes to apply for e-BG	<i>xi. Bank Name:</i> <i>xii. IFSC:</i> <i><To be entered by the bidder></i>
--	--

6. e-BG Amount and Validity Details:

Currency in which e-BG is required	 <i><To be selected from dropdown by bidder></i>
e-BG Amount	 <i><To be automatically fetched by IREPS></i>
Validity period required for e-BG	DD.MM.YYYY <i>To be automatically calculated by IREPS</i>
Claim Lodging Period required for e-BG	DD.MM.YYYY <i>To be automatically calculated by IREPS</i>

7. Details of Railways for entering into SFMS (Structured Financial Messaging System):

IFSC	SBIN000RAIL
IFSC Type	BRANCH
Bank Name	STATE BANK OF INDIA
Branch Name	RAIL
City Name	NAVI MUMBAI
Address	SECTOR-11, CBD BELAPUR, NAVI MUMBAI
District	NAVI MUMBAI
State	MAHARASHTRA
BG Enabled	YES

8. Details of the Bank Officer issuing e-BG:

Name of the Officer	<i><To be entered by the Bank at the time of issuing e-BG></i>
Designation	
Employee Code	



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Email Id	
Contact Number	



SCHEDULE - F

(See Clauses 7.1.1, 7.5.3 and 17.2)

FORM OF INSURANCE SURETY BOND

Annex-IA

(See Clause 7.1.1)

Performance Security

Name of the issuer of surety bond:

President of India,
Acting through Chief Administrative Officer/Construction,
N.E. Railway, Gorakhpur

Beneficiary: **FA&CAO/Con/N.E. Railway, Gorakhpur**

Date:.....

.....

Surety Bond No: Issue Date:.....

Amount of Bond:..... Expiry Date:.....

WHEREAS, In consideration of the President of India acting through(Designation & address of contract signing authority),.....Railway,....., (hereinafter called “The Railway”) having accepted the bid of M/S XXXXX hereinafter called the contractor, for the work of XXX” under invitation for bids No XXXX Dated XXXXX, Vide Letter of Acceptance No.

AND

WHEREAS, the contractor is required to furnish Performance Security for the sum of Rs. XXXX (Rupees XXXX Only), in the form of Surety Bond, being a condition precedent to the signing of the contract agreement



SBNo:

Date:

WHEREAS, we, _____, (Name of insurance company) hereinafter called the Surety, acting through [Designation(s) of the authorised person of the Surety], have, at the request of the M/s. XXXX contractor, agreed to give Bond for performance security/ additional performance security as hereinafter contained:

1. KNOW ALL MEN by these present that I/We the undersigned [Insert name(s) of authorized representatives of the Surety], being fully authorized to sign and incur obligations for and on behalf of the Surety, confirm that the Surety, hereby, unconditionally and irrevocably Bond to pay the Railway the full amount in the sum of XXXX (Rupees XXXX Only) as above stated.
2. The Surety undertakes to immediately pay on presentation of demand by the Railway any amount up to and including aforementioned full amount without any demur, reservation or recourse. Any such demand made by the Railway on the Surety shall be final, conclusive and binding, absolute and unequivocal notwithstanding any disputes raised/pending before any Court, Tribunal, Arbitration or any Authority or any threatened litigation by the Bidder or Bank.
3. On payment of any amount less than aforementioned full amount, as per demand of the Railway, the Bond shall remain valid for the balance amount i.e. the aforementioned full amount less the payment made to the Railway.
4. The Surety shall pay the amount as demanded immediately on presentation of the demand by Railway without any reference to the contractor and without the Railway being required to show grounds or give reasons for its demand or the amount demanded.
5. The Surety Bond shall be unconditional and irrevocable.
6. The Bond hereinbefore shall not be affected by any change in the constitution of the Surety or in the constitution of the Contractor.
7. The Surety agrees that no change, addition, modifications to the terms of the Contract Agreement or to any documents, which have been or may be made between the Railway and the Contractor, will in any way release us from the liability under this Bond; and the Surety, hereby, waives any requirement for notice of any such change, addition or modification to the Surety.
8. This Bond is valid and effective from the date of its issue, which is [insert date of issue]. The Bond and our obligations under it will expire on XXXX (Expiry Date). All demands for payment under the Bond must be received by us on or before that date.
9. The Surety agrees that the Railways right to demand payment of aforementioned full amount in one instance or demand payments in parts totalling up to the aforementioned full amount in several instances will be valid until either the aforementioned full amount is paid to the Railway or the Bond is released by Railway before the Expiry date.
10. The Surety agrees that its obligation to pay any amount demanded by the Railway before the expiry of this Bond will continue until the amount demanded has been paid in full.
11. The expressions Surety and Railway hereinbefore used shall include their respective successors, administrators and assigns.



SBNo:

Date:

12. The Surety hereby undertakes not to revoke the Bond during its currency, except with the previous consent in writing of the Railway. This Bond is subject to the Uniform Rules for Demand Bonds, ICCPublicationNo.758.
13. We, the Surety Insurer, further agree that the Authority shall be the sole judge to decide as to whether the Bidder is in default of due and faithful fulfilment and compliance with the terms and conditions contained in the Bidding Documents including, Inter alia, the failure of the Bidder to keep its Bid open during the Bid validity period set forth in the said Documents, and the decision of the Authority that the Bidder is in default as aforesaid shall be final and binding on us, notwithstanding any differences between the Authority and the Bidder or any dispute pending before any Court, Tribunal, Arbitrator or any other Authority.
14. The Bond shall be in addition to and without prejudice to any other security Bond (s) of the contractor in favour of the Railway available with the Railway. The Surety, under this Bond, shall be deemed as Principal Debtor of the Railway.

Notwithstanding anything to the contrary contained in these presents,

- a. Our liability under this Surety Bond shall not exceed XXXX (Rupees XXXXX Only)
- b. This Surety Bond shall be valid up XXXX (being the date of expiry);
- c. Unless the bank is served a written claim or demand on or before XXXX all rights under this Bond shall be forfeited and the Surety shall be relieved and discharged from all liabilities under this Bond irrespective of whether or not the original Surety bond is returned to the Surety

Dated the day of 2024

15. The Insurance Surety Bond shall be verified by sending mail to [customer.care@sbgeneral.in]

Place.....

Bank's Seal and authorized signature(s)
[Name in Block letters]
[Designation with Code No.].....

[P/Attorney] No.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Witness

1.

2.

* * * * *

Note: All italicized texts are for guidance on how to prepare this Insurance Surety Bond and shall be deleted from the final document.



Annex – II
(Schedule - F)
(See Clause 7.5.3)

Form of Guarantee for Withdrawal of Retention Money

President of India,
Acting through Chief Administrative Officer/Construction,
N.E. Railway, Gorakhpur

Beneficiary: **FA&CAO/Con/N.E. Railway, Gorakhpur**

WHEREAS:

- (A) [insert name and address of the contractor] (hereinafter called the “**Contractor**”) has executed an agreement (hereinafter called the “**Agreement**”) with the [name and address of the project authority], (hereinafter called the “**Authority**”) for the construction of the new railway line between ****_**** in the **** Railway zone on Engineering, Procurement and Construction (the “**EPC**”) basis, subject to and in accordance with the provisions of the Agreement.
- (B) In accordance with Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called the “**Retention Money**”) after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.
- (C) We, through our branch at (the “**Bank**”) have agreed to furnish this bank guarantee (hereinafter called the “**Guarantee**”) for the amount of Rs. cr. (Rupees.....crore) (the “**Guarantee Amount**”).

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

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



notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Retention Money and any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Retention Money.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect 15 (fifteen) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.



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

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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



Annex-II
(Schedule - F)
(See Clause 7.5.3)

Form of Guarantee for Withdrawal of Retention Money

E- Bank Guarantee Bond from any scheduled commercial bank of India.

President of India,
Acting through Chief Administrative Officer/Construction,
N.E. Railway, Gorakhpur

Beneficiary: **FA&CAO/Con/N.E. Railway, Gorakhpur**

Date:.....

E-Bank Guarantee Bond No.:

Date:-----

Reference:- Contract No _____, **awarded on** _____.

WHEREAS:

- (A) [insert name and address of the contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the project Railway], (hereinafter called the "**Railway**") for in the Railway zone, subject to and in accordance with the provisions of the Agreement.
- (B) In accordance with the Agreement, the Contractor may withdraw the retention money (hereinafter called the "**Retention Money**") after furnishing to the Railway a bank guarantee for an amount equal to the proposed withdrawal.
- (C) We,.....through our branch at(the "**Bank**") have agreed to furnish this E-bank guarantee (hereinafter called the "**Guarantee**") for the amount of Rs.....cr. (Rupeescrore) (the "**Guarantee Amount**").

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

- 1. The Bank hereby unconditionally and irrevocably undertakes to pay to the Railway, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Railway shall claim, without the Railway being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
- 2. A letter from the Railway, under the hand of an officer not below the rank of [***in the ***] Railway, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in



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

3. In order to give effect to this Guarantee, the Railway shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Railway to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Railway shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and / or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Railway against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Railway, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Railway of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Railway or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Railway in respect of or relating to the Retention Money.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Railway on the Bank under this Guarantee all rights of the Railway under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect 15 (fifteen) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Railway in writing, and declares and



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

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

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank
by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

e-BG towards Withdrawal of Retention Money

Challan for the e-BG

1. Challan reference:

IREPS Reference ID (Unique Reference Number)	<Some number to be automatically generated by IREPS>
Challan Date	DD.MM.YYYY <To be automatically fetched by IREPS>



2. Beneficiary Details:

Beneficiary Details	<The associate paying Railway for the tender issuing Railway. To be automatically fetched by IREPS>
Bank Details of the Beneficiary	xix. Account Number xx. Bank Name xxi. IFSC <To be automatically fetched by IREPS>

3. Tender Details:

Tender No.	<To be automatically fetched by IREPS> <Should not be edited by the Bank>
Tender closing date	<To be automatically fetched by IREPS>
Railway Zone	<To be automatically fetched by IREPS>
Railway Unit	<To be automatically fetched by IREPS>
Railway Department	<To be automatically fetched by IREPS>

4. Bidder Details:

Bidder Name	<To be automatically fetched by IREPS>
Bidder ID	<To be automatically fetched by IREPS>
Country of Registration of the Bidder	<To be automatically fetched by IREPS from the vendor master>
Nature of Constitution of the Bidder	<i.e. proprietor or company, etc. To be automatically fetched by IREPS from the vendor master>
Contact person	<To be entered by the bidder>
Contact number and email	<To be entered by the bidder>

5. Bank Details of the Bidder:

Details of the Bank in India through which the bidder wishes to apply for e-BG	xiii. Bank Name: xiv. IFSC: <To be entered by the bidder>
--	---

6. e-BG Amount and Validity Details:

Currency in which e-BG is	_____
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EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

required	<To be selected from dropdown by bidder>
e-BG Amount	 <To be automatically fetched by IREPS>
Validity period required for e-BG	DD.MM.YYYY <To be automatically calculated by IREPS>
Claim Lodging Period required for e-BG	DD.MM.YYYY <To be automatically calculated by IREPS>

7. Details of Railways for entering into SFMS (Structured Financial Messaging System):

IFSC	SBIN000RAIL
IFSC Type	BRANCH
Bank Name	STATE BANK OF INDIA
Branch Name	RAIL
City Name	NAVI MUMBAI
Address	SECTOR-11, CBD BELAPUR, NAVI MUMBAI
District	NAVI MUMBAI
State	MAHARASHTRA
BG Enabled	YES

8. Details of the Bank Officer issuing e-BG:

Name of the Officer	<To be entered by the Bank at the time of issuing e-BG>
Designation	
Employee Code	
Email Id	
Contact Number	



Annex – III
(Schedule - F)
(See Clause 17.2)

Form of Guarantee for Advance Payment

President of India,
Acting through Chief Administrative Officer/Construction,
N.E. Railway, Gorakhpur

Beneficiary: **FA&CAO/Con/N.E. Railway, Gorakhpur**

WHEREAS:

- (A) [name and address of the contractor] (hereinafter called the “**Contractor**”) has executed an agreement (hereinafter called the “**Agreement**”) with the [name and address of the project authority], (hereinafter called the “**Authority**”) for the construction of the new railway line between ***in the ***Railway zone on Engineering, Procurement and Construction (the “**EPC**”) basis, subject to and in accordance with the provisions of the Agreement.
- (B) In accordance with Clause 17.2 of the Agreement, the Authority shall make to the Contractor advance payment (herein after called “**Advance Payment**”) equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a Bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs.cr. (Rupeescrore) and the amount of this Guarantee is Rs. cr. (Rupees crore)(the “**Guarantee Amount**”)⁵.
- (C) We, through our branch at (the “**Bank**”) have agreed to furnish this bank guarantee (hereinafter called the “**Guarantee**”) for the Guarantee Amount.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid instalment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any

⁵The Guarantee Amount should be equivalent to 110% of the value of the applicable installment.



reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of [***in the ***Railway], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.



7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on ****.[§] Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.
11. The Bank hereby confirms that it is on the SFMS (Structured Financial Messaging System) and shall invariably send the advice of this Bank Guarantee to the following bank details –

IFSC CODE	SBIN000RAIL
IFSC TYPE	BRANCH
BANK NAME	STATE BANK OF INDIA
BRANCH NAME	RAIL
CITY NAME	NAVI MUMBAI
ADDRESS	SECTOR-11, CBD BELAPUR, NAVI MUMBAI
DISTRICT	NAVI MUMBAI
STATE	MAHARASHTRA
BG ENABLED	YES

[§] Insert a date being 90 (ninety) days after the end of one year from the date of payment of the Advance payment to the Contractor (in accordance with Clause 17.2 of the Agreement).



12. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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



Annex-III
(Schedule - F)
(See Clause 17.2)

Form of Guarantee for Advance Payment

E- Bank Guarantee Bond from any scheduled commercial bank of India.

President of India,
Acting through Chief Administrative Officer/Construction,
N.E. Railway, Gorakhpur

Beneficiary: **FA&CAO/Con/N.E. Railway, Gorakhpur**

Date:.....

E-Bank Guarantee Bond No.:

Date:-----

Reference:- Contract No _____, **awarded on** _____.

WHEREAS:

- (A) [insert name and address of the contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the project Railway], (hereinafter called the "**Railway**") for in the Railway zone, subject to and in accordance with the provisions of the Agreement.
- (B) In accordance with the Agreement, the Railway shall make to the Contractor advance payment (herein after called "**Advance Payment**"); and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a Bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs.cr. (Rupeescrore) and the amount of this Guarantee is Rs. cr. (Rupees crore) (the "**Guarantee Amount**").
- (C) We,.....through our branch at (the "**Bank**") have agreed to furnish this E-bank guarantee (hereinafter called the "**Guarantee**") for the amount of Rs.....cr. (Rupeescrore) (the "**Guarantee Amount**").

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid instalment of the Advance



- Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Railway, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Railway shall claim, without the Railway being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Railway, under the hand of an officer not below the rank of [***in the ***] Railway, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Railway shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Railway and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other Authority or body, or by the discharge of the Contractor for any reason whatsoever.
 3. In order to give effect to this Guarantee, the Railway shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
 4. It shall not be necessary, and the Bank hereby waives any necessity, for the Railway to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
 5. The Railway shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Railway against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Railway, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Railway of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Railway or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
 6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Railway in respect of or relating to the Advance Payment.
 7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below



- and unless a demand or claim in writing is made by the Railway on the Bank under this Guarantee all rights of the Railway under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on ***. Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.
 9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Railway in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
 10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Railway that the envelope was so posted shall be conclusive.
 11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Railway pursuant to the provisions of the Agreement.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank

by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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



e-BG towards Advance Payment Challan for the e-BG

1. Challan reference:

IREPS Reference ID (Unique Reference Number)	<Some number to be automatically generated by IREPS>
Challan Date	DD.MM.YYYY <To be automatically fetched by IREPS>

2. Beneficiary Details:

Beneficiary Details	<The associate paying Railway for the tender issuing Railway. To be automatically fetched by IREPS>
Bank Details of the Beneficiary	xxii. Account Number xxiii. Bank Name xxiv. IFSC <To be automatically fetched by IREPS>

3. Tender Details:

Tender No.	<To be automatically fetched by IREPS> <Should not be edited by the Bank>
Tender closing date	<To be automatically fetched by IREPS>
Railway Zone	<To be automatically fetched by IREPS>
Railway Unit	<To be automatically fetched by IREPS>
Railway Department	<To be automatically fetched by IREPS>

4. Bidder Details:

Bidder Name	<To be automatically fetched by IREPS>
Bidder ID	<To be automatically fetched by IREPS>
Country of Registration of the Bidder	<To be automatically fetched by IREPS from the vendor master>
Nature of Constitution of the Bidder	<i.e. proprietor or company, etc. To be automatically fetched by IREPS from the vendor master>
Contact person	<To be entered by the bidder>



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Panahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Panahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Contact number and email	<To be entered by the bidder>
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5. Bank Details of the Bidder:

Details of the Bank in India through which the bidder wishes to apply for e-BG	xv. Bank Name: xvi. IFSC: <To be entered by the bidder>
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6. e-BG Amount and Validity Details:

Currency in which e-BG is required	_____ <To be selected from dropdown by bidder>
e-BG Amount	_____ <To be automatically fetched by IREPS>
Validity period required for e-BG	DD.MM.YYYY <To be automatically calculated by IREPS>
Claim Lodging Period required for e-BG	DD.MM.YYYY <To be automatically calculated by IREPS>

7. Details of Railways for entering into SFMS (Structured Financial Messaging System):

IFSC	SBIN000RAIL
IFSC Type	BRANCH
Bank Name	STATE BANK OF INDIA
Branch Name	RAIL
City Name	NAVI MUMBAI
Address	SECTOR-11, CBD BELAPUR, NAVI MUMBAI
District	NAVI MUMBAI
State	MAHARASHTRA
BG Enabled	YES

8. Details of the Bank Officer issuing e-BG:

Name of the Officer	<To be entered by the Bank at the time of issuing e-BG>
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EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Designation	
Employee Code	
Email Id	
Contact Number	



Annex-IV
(Schedule - F)

**FORMAT OF THE DECLARATION TO BE FURNISHED BY BANKS FOR
ISSUANCE OF eBG**

WHOMSOEVER IT MAY CONCERN

We, _____ (*Name of Bank*, hereinafter referred to as "the Bank"), having our registered office at _____ (*details of the complete address of the Bank*), hereby issue the following declaration in connection with the issuance of Electronic Bank Guarantees (eBGs) in favour of Indian Railways:

- (1) The Bank hereby declares and confirms that all eBGs that will be issued by it in favour of Indian Railways, pursuant to this declaration, shall be issued strictly and without any deviation in the format of eBG transmitted to the Bank through the IREPS/NeSL portal.
- (2) In the event that any deviation from the format of eBG transmitted to the Bank through the IREPS/NeSL portal is subsequently detected in any eBG issued by the Bank, whether such deviation arose inadvertently or otherwise, the Bank expressly agrees and undertakes that:
 - (a) the Bank's obligations under such eBG shall remain irrevocable, unconditional and incontrovertible as per the format of eBG transmitted to the Bank through the IREPS/NeSL portal and
 - (b) the Bank shall honour and discharge its liabilities strictly as per the format of eBG transmitted to the Bank through the IREPS/NeSL portal, notwithstanding any deviation in the text of the eBG actually issued.
- (3) The Bank expressly confirms that it is fully aware that the Ministry of Railways shall not undertake nor be required to undertake any verification, scrutiny or re-checking of the language, text or format of any eBG issued by the Bank pursuant to this declaration. The Bank hereby waives any requirement for such verification or scrutiny by the Ministry of Railways and agrees that non-performance of such verification shall not, in any manner, affect, limit, dilute or absolve the Bank's liability under any eBG issued pursuant to this declaration. The Bank further undertakes that, notwithstanding the absence of such verification, it shall issue every eBG strictly in the format of eBG transmitted to the Bank through the IREPS/NeSL portal and shall remain fully, absolutely and unconditionally liable to honour the eBG as per the format of eBG transmitted to the Bank through the IREPS/NeSL portal.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

(4) This declaration shall be irrevocable during its validity period.

This declaration has been issued on _____ (DD.MM.YYYY) at _____ (Place) and shall remain valid for a period of two (2) years from the date of issue.

Authorised Signatory:

Name:	
Designation:	
Employee Code:	
Bank and Branch:	
Email ID:	
Contact Number:	



SCHEDULE - G
(See Clauses 10.1.4 and 17.3)

Contract Price Weightages (For Lump sum value of this agreement)

- 1.1 The Estimated Contract Price for this Schedule is **Rs. 351,58,66,895.56 (Rupees Three Fifty One Crore Fifty Eight Lakh Sixty Six Thousand Eight Hundred Ninety Five and Fifty Six Paise Only)** it is assigned for different components of the Railway Project as follows:

For works consisting of Civil & Track works, Signalling and Telecom works and Electrification works

Civil and track works	83.60% of the Contract Price
Signalling works	8.10% of the Contract Price
Telecom works	
Electrification works	8.30% of the Contract Price



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

1.0 Civil and Track works

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
1.1	Earthwork	10.00%	1.1.1	Earthwork in embankment/cutting including compaction up to H*/4 from ground level complete in all respects.	30%	(a) Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a continuous length of minimum 50 m. (b) Provided that payment for the blanketing layer shall be made on completion of minor bridges including slab/RCC box (item no 1.5)/pipe culverts (item 1.6) in the length for which stage payment is claimed. For the avoidance of doubt, payment for minor Bridges shall be payable separately in accordance with item 1.5
			1.1.2	Earthwork in embankment/cutting including compaction from H/4 to H/2 from ground level complete in all respects.	30%	
			1.1.3	Earthwork in embankment/cutting including compaction from H/2 to 3H/4 from ground level complete in all respects.	20%	



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure						
			1.1.4	Earthwork in embankment/cutting including compaction from 3H/4 level to H from ground level complete in all respects.	20%	and pipe culverts shall be payable separately in accordance with item 1.6. *H = Height of formation from ground level minus blanketing thickness Note: - 1. The whole Project length may be divided in sections depending on average Formation Height/depth Up to 3 m, 3 to 6 m, 6 to 9 m and 9 m and above. In each section Km number shall be grouped according to average formation Height. 2. Payment of Earthwork in Paniahwa to Chhitauni Section shall be made only in one stage under item no. 1.1.4 on completion of Earthwork upto H level.						
			1.1.5	Completion of Soil Stabilization complete in all respect.	0%	<table><tr><th>Height Range</th><th>Km (From)</th><th>Km (To)</th></tr><tr><td>Up to 3 m</td><td>0.350</td><td>10.000</td></tr><tr><td>3m to 6m</td><td>10.000</td><td>29.400</td></tr></table> 3. For item no. 1.1.5, a separate item has been provided in Schedule-G1.	Height Range	Km (From)	Km (To)	Up to 3 m	0.350	10.000
Height Range	Km (From)	Km (To)										
Up to 3 m	0.350	10.000										
3m to 6m	10.000	29.400										
				Total:	100%							
1.2	Blanketing & Turfing	15.00%	1.2.1	Blanketing work completes in all respect	97%	(a) For item no. 1.2.1, unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a continuous length of minimum 50 m. Note: 5% Payment of each stage of item no. 1.2.1 will be withheld and will be						
			1.2.2	Slope Protection by Turfing of formation Slope	3%							
			1.2.3	Pitching of Formation Slope	0%							



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
						released with payment of item no. 1.2.2. (b) For item no. 1.2.2, unit of measurement is linear length of formation. Payment of each stage shall be made on pro rata basis on completion of a stage in a continuous length of minimum 100 m of the after completion of both sides slopes. (c) For item no. 1.2.3, a separate item has been provided in Schedule-G1.
				Total:	100%	
1.3	Important Bridges	NA	1.3.1	Foundation: Completion of the foundation work including pile caps/ well caps and foundations for wing and return walls, and testing.		(a) Cost of each bridge shall be determined on pro rata basis with respect to the total linear length of the Important Bridges. (b) In case a particular component of a bridge is not complete in full linear waterway, Cost of each individual component of that bridge shall be determined in proportion to that particular span with respect to the full linear waterway of that bridge. (c) Payment shall be made on completion of each component/stage of an Important Bridge as per the weightage given in this schedule. (d) For item no 1.3.4 if a bridge is constructed using pre-cast concrete element/composite girders/plate girders/open web girders etc:60 % payment shall be released upon finishing
			1.3.1/a	Foundation of pier/Abutment.	-	
			1.3.1/b	Foundation of return/wing wall	-	
			1.3.2	Sub-structure: Completion of abutment/piers including bed blocks (without bearings).		
			1.3.2/a	Pier/Abutment shaft.	-	
			1.3.2/b	Pier/Abutment cap.	-	
			1.3.3	Completion of the wing walls, return walls in all respects.	-	
			1.3.4	Super-structure: Completion of the super	-	



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
				structure except deck slab and bearings		casting of concrete pre-cast elements/Assembled plate girders/Assembled open web girders etc& transportation to site (e) For item no 1.3.1/a and 1.3.1/b if a bridge is constructed with pile/well foundation: 70% payment shall be released upon finishing the piling/well sinking activity. [For the purpose of calculation of quantity item No. 1.3.1/a and 1.3.1/b, the cost of each foundation shall be determined by dividing total cost of the foundation of all the bridges by number of piers and abutments/return wall of all bridges, for item No. 1.3.2/a and 1.3.2/b cost of each sub-structure shall be determined by dividing total cost of the sub-structure of all the bridges by number of piers and abutments of all the bridges , for item no 1.3.3 cost of each set of wing and return wall shall be determined by dividing total cost of the wing and return wall of all the bridge by number of abutments of all the bridges, for item no 1.3.4 and 1.3.5 cost of each span shall be determined by dividing total cost of the super structure of all the bridge by number of spans of all the bridges, for item no 1.3.6 cost of miscellaneous works shall be determined by dividing total misc. cost of the bridge of all the bridge by number of all the bridges - These instructions are to be deleted after customisation].
			1.3.5	Completion of the deck slab, bearings/ expansion joints and making bridge ready for track linking including Bearings.	-	
			1.3.6	Miscellaneous works: Completion of the remaining works including hand rails, walls, all protection works, pitching, turfing, river training works, if any, tests, etc., complete in all respects and fit for use.	-	
				Total:	100%	



Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
1.4	Major Bridges	4.00%	1.4.1	Foundation: Completion of the foundation work including pile caps/ well caps and foundations for wing and return walls, and testing.		(a) For item 1.4.1 to 1.4.3, Foundation work and Substructure work will be paid in BOQ items as given in Schedule: G1 A.
			1.4.1/a	Foundation of pier/Abutment.	0%	(b) Cost of each bridge shall be determined on pro rata basis with respect to the total linear length of the Major Bridges.
			1.4.1/b	Foundation of return/wing wall	0%	
			1.4.2	Sub-structure: Completion of abutment/piers including bed blocks (without bearings).		(c) In case any component of bridge is not complete in full, then Cost of each component of individual bridge shall be determined on pro rata basis with respect to the total linear length of that bridge.
			1.4.2/a	Pier/Abutment shaft.	0%	
			1.4.2/b	Pier/Abutment cap.	0%	
			1.4.3	Completion of the wing walls, return walls in all respects.	0%	(d) For item no 1.4.4 if a bridge is constructed using pre-cast concrete element/composite girders/plate girders/open web girders etc: 70% payment shall be released upon finishing casting of concrete pre-cast elements/Assembled plate girders/Assembled open web girders etc. & transportation to site.
			1.4.4	Super-structure: Completion of the super structure except deck/PSC slab and bearings	72%	
			1.4.5	Completion of the deck slab, bearings/ expansion joints and making bridge ready for track linking including Bearings.	8%	
			1.4.6	Miscellaneous works: Completion of the remaining works including transition system on bridges approach, hand rails, all protection works if any, tests, etc., complete in all respects and fit for use.	20%	(e) For item no 1.4.4 and 1.4.5 cost of each span shall be determined by dividing total cost of the superstructure of all the bridges by total length of spans of all the bridges, for item no 1.4.6 cost of misc. works shall be determined by dividing total misc. cost of the bridge of all the bridge by number of all the bridges.
				Total:	100%	
1.5	Minor Bridges	3.00%	1.5.1	On completion of the RCC boxes & slab, wing wall & return wall of the slab bridges.	62%	(a) Cost of each bridge shall be determined on pro rate basis with respect to the total clear



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
			1.5.2	On completion of the Wing wall and Return wall of the RCC boxes.	14%	span of the Minor Bridges.
			1.5.3	On completion of Balance works of apron, curtain wall, drop wall, transition system on bridges approach, other protection works and tests etc. complete in all respects.	24%	<p><i>Please note: For the slab bridge (minor bridge), mentioned in table in clause 1.4.7 (a) of Annexure I (Schedule B) in description of Railway Project, Foundation work and Substructure work will be paid in BOQ items as given Schedule: G1 A. And, payment of superstructure will be made under this item 1.5 of Schedule G.</i></p> <p>(b) Payment shall be made on completion of each component/stage of a Minor Bridge as per the weightage given in this schedule.</p> <p>For the purpose of calculation of quantity of item No. 1.5.1, the cost of each RCC boxes, Abutments, pier & slab for slab bridges shall be determined by dividing total cost of the RCC boxes, slab for slab bridges of the bridge by number of Minor bridges, for item No. 1.5.2, the cost of each Return/wing wall shall be determined by dividing total cost of the Return/wing wall of all bridges by number of Minor bridges and for item No. 1.5.3, payment shall be made on completion of the all stages of Bridge on pro rate basis.</p>
				Total:	100%	
1.6	Pipe Culverts	NA	1.6	Pipe culvert	-	Cost of each pipe culvert shall be determined on pro rata basis with respect to the total barrel length (in linear metre) of the culverts. Payment shall be made on completion of a formation above culvert



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
						in a continuous length of minimum 100 m.
				Total:	100%	
1.7	ROB	NA	1.7.1	Foundation: Completion of the foundation work including pile caps/ well caps and foundations for wing and return walls, and testing.		(a) Cost of each ROB shall be determined on pro rate basis with respect to the total linear length of the ROB.
			1.7.1/a	Foundation of pier/abutments	-	(b) In case any component of bridge is not complete full, then Cost of each component of foundation/substructure of ROB shall be determined on pro rate basis with respect to the total linear length of the individual ROB.
			1.7.1/b	Foundation of return/wing wall	-	
			1.7.2	Sub-structure: Completion of abutment/piers including bed blocks (without bearings).		
			1.7.2/a	Pier/Abutment shaft.	-	(c) Payment shall be made on completion of each stage of a ROB as per the weightage given in this schedule.
			1.7.2/b	Pier/Abutment cap	-	
			1.7.2/c	Return/wing wall	-	
			1.7.3	Super-structure: Completion of the super structure		(d) For item no 1.7.1/a and 1.7.1/b if a bridge is constructed with pile foundation : 70% payment shall be released upon finishing the piling activity.
			1.7.3/a	Construction of Super structure except deck slab, expansion joint , bearings	-	
			1.7.3/b	Construction of deck slab, expansion joint, bearings and making superstructure fit for laying road carpeting	-	
			1.7.4	Miscellaneous works: Completion of the remaining works including bearings, hand rails, walls, all protection works, pitching, turfing, load tests, etc., complete in all respects	-	[For the purpose of calculation of quantity item No. 1.7.1/a and 1.7.1/b, the cost of each foundation shall be determined by dividing total cost of the foundation of all the bridges by number of piers and abutments/return wall of all bridges, for item No. 1.7.2/a , 1.7.2/b and 1.7.2/c cost of each sub-structure shall be determined by dividing total cost of the sub-structure of all the bridges by number of piers and abutments/return wall of all the bridges ,
			1.7.5	Completion of approaches in all respect and fit for offering the asset for CRS inspection.	-	



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
						for item no 1.7.3/a and 1.7. 3/b cost of each span shall be determined by dividing total cost of the super structure of all the bridge by number of spans of all the bridges, for item no 1.7.4 cost of misc works shall be determined by dividing total misc. cost of the bridge of all the bridge by number of all the bridges, for item no 1.7.5 cost of approaches works shall be determined by dividing total approaches works cost of the bridge of all the bridge by number of all the bridges - These instructions are to be deleted after customisation].
				Total:	100%	
1.8	RUB/LHS	12.00%	1.8.1	On completion of the RCC boxes barrel/Abutments, pier & slab for slab bridges.	33%	(a) Cost of each RUB/LHS shall be determined on pro rate basis with respect to the total clear span of the RUB/LHS. (b) Payment shall be made on completion of each component/stage of an RUB/LHS as per the weightage given in this schedule For the purpose of calculation of quantity of item No. 1.8.1, the cost of each RCC boxes, Abutments, pier & slab for slab bridges shall be determined by dividing total cost of the RCC boxes, Abutments, pier & slab for slab bridges of all RUB/LHS by number of RUB/LHS, for item No. 1.8.2, the cost of each Return /wing wall shall be determined by dividing total cost of the Return/wing wall of all RUB/LHSs by number of RUB/LHS and for item No. 1.8.3, the cost of each Retaining wall of Approach Roads shall be determined by dividing
			1.8.2	On completion of works of Wing wall/return wall, transition system on bridges approach, tests etc. and making bridge Fit for track linking.	24%	
			1.8.3	On completion of Retaining wall of Approach Roads and Road works in all respect	22%	
			1.8.4	On completion height gauge, Roofing of approaches, drainage arrangement and all other ancillary works in all respects	21%	



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
						total cost of Retaining wall of Approach Roads for all RUB/LHS by number of ROB/LHS and for item No. 1.8.4, the cost of each height gauge, Roofing of approaches, drainage arrangement and all other ancillary works shall be determined by dividing total cost of height gauge, Roofing of approaches, drainage arrangement and all other ancillary works for all RUB/LHS by number of ROB/LHS.
				Total:	100%	
1.9	Flyovers	NA	1.9.1	Foundation: Completion of the foundation work (open foundations/pile foundations including pile caps) and testing.		a. Cost of each flyover shall be determined on pro rate basis with respect to the total linear length of the flyovers.
			1.9.1/a	Foundation work of abutment/piers	-	b. In case any component of Flyover is not complete full, then cost of each component of foundation/substructure of flyover shall be determined on pro rate basis with respect to the total linear length of the individual flyover.
			1.9.1/b	Foundation work of return walls	-	
			1.9.2	Sub-structure: Completion of substructure, abutment/piers including bed blocks (without bearings)		
			1.9.2/a	Pier/abutment shaft	-	
			1.9.2/b	Pier/abutment caps	-	c. Payment shall be made on completion of each stage of a flyover as per the weightage given in this schedule.
			1.9.2/c	Return wall	-	
			1.9.3	Super-structure: Completion of the super structure ready for track linking including bearings.		
			1.9.3/a	Casting /launching of super str without deck slab and bearing	-	d. For item no 1.9.1/a and 1.9.1/b if a bridge is constructed with pile foundation : 70% payment shall be released upon finishing the piling activity
			1.9.3/b	Casting of deck slab, expansion joints and fixing bearings and making bridge fit for track linking	-	
			1.9.4	Miscellaneous works: Completion of the	-	



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
				remaining works, hand rails, walls, all protection works road works etc., complete in all respects and fit for use		<p>e. For item no 1.9.3 if a bridge is constructed using pre-cast concrete element/composite girders/plate girders/open web girders etc : 70% payment shall be released upon finishing casting of concrete pre-cast elements/Assembled plate girders/Assembled open web girders etc & transportation to site</p> <p>[For the purpose of calculation of quantity of item No. 1.9.1/a and 1.9.1/b, the cost of each foundation shall be determined by dividing total cost of the foundation of all the Flyovers by number of piers and abutments of all the Flyovers, for item No. 1.9.2/a and 1.9.2/b cost of each sub- structure shall be determined by dividing total cost of the sub-structure of all Flyovers by number of piers and abutments/return wall of all the Flyovers, for item no 1.9.3/a and 1.9.3/b cost of each span shall be determined by dividing total cost of the super structure of all Flyovers by number of spans of all the Flyovers, for item No. 1.9.4 the cost of each remaining works, hand rails, walls, all protection works road works shall be determined by dividing total cost of remaining works, hand rails, walls, all protection works road works for all Flyover by number of all Flyovers - These instructions are to be deleted after customisation].</p>
				Total:	100%	
1.10	Track works	21.10%	1.10.1	Supply of ballast and staking	20%	(a) Unit of measurement is cum for item No. 1.10.1 cum. [80%] payment may be will be released after taking indemnity bond. The
			1.10.2	Bed Ballast laying, compacting initial layer of 200 mm to facilitate mechanized track	5%	



Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
				laying.		<p>unit of measurement of cum ballast is only for releasing interim payment. After completion of track work qty of ballast will be reconciled on basis of minimum ballast cushion of 350 mm on main line and 300 mm on loop line.</p> <p>(b) Unit of measurement is linear length. For items from 1.10.2 to 1.10.4. Payment of each stage shall be made on pro rata basis on completion of a stage in a continuous length of minimum 100 m.</p> <p>(c) For item no 1.10.3 Payment shall be made on completion of a track work in block section on pro rata basis with reference to the total length of main lines.</p> <p>(d) For item no 1.10.4 Payment shall be made on completion of a yard on pro rata basis with reference to the total length of all loop lines in all the yards.</p> <p>(e) On supply of complete T/O sleepers sets payments of 15% of item No. 1.10.4/a and 1.10.4/b will be released on prorata basis after taking indemnity bond.</p> <p>(f) On supply of T/O switches, Xings and fittings, payments of 35% of item No. 1.10.4/a and 1.10.4/b will be released on</p>
			1.10.3	Mechanized track laying in block section between station limits on PSC sleepers complete in all respects including laying 60 Kg PSC sleepers at sleeper density of 1660/km, laying of rails, supplying and fixing switch expansion joints, glued joints, guard rails, check rails, along with welding of rails, supply and fixing all rail sleeper fittings etc. complete linkage of track as per track diagram.		
			1.10.3/a	Skelton linking without supplying and fixing switch expansion joints, glued joints, guard rails, check rails, along with welding of rails, supply and fixing all rail sleeper fittings etc. complete linkage of track	30%	
			1.10.3/b	Supplying and fixing switch expansion joints, glued joints, guard rails, check rails, along with welding of rails, supply and fixing all rail sleeper fittings etc. complete linkage of track	10%	
			1.10.4	Mechanized Track laying in yards (within station limits) on PSC sleepers complete in all respects including supply of new 60 kg PSC sleepers, laying of sleepers at sleeper density of 1660/km on main line and 1660/Km on loop line], providing and laying points and crossings, switch expansion joints, glued joints, derailing switch in all lines in yards etc. complete to ensure continuous and complete linkage of track in the yard as per yard plan.		



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
			1.10.4/a	Skelton linking without providing and laying points and crossings, switch expansion joints, glued joints, derailling switch in all lines in yards etc. complete to ensure continuous and complete linkage of track in the yard as per yard plan.	5%	<p>prorate basis after taking indemnity bond.</p> <p>Note: In case option of item No. 1.10.1 is not operated, then this item will be added in item No. 1.10.2 and 1.10.5</p> <p>1.10.6 This will be used for payment of loading, transportation and unloading of Service rails and SH rails in 13m- 6.5m. 1.06% (85 percent of 1.25%) is to be paid for the transportation of Service rails and SH rails in 13m-6.5m. The payment of transportation shall be made on the basis of actual work done in proportionate MTKM of total 1,70,450 MTKM. Remaining 0.19% (15 percent of 1.25%) is to be used for payment of loading and unloading of Service rails and SH rails in 13m- 6.5m. The payment of loading and unloading shall be made on the basis of actual work done in proportionate MT of total 3000 MT.</p>
			1.10.4/b	providing and laying points and crossings, switch expansion joints, glued joints, derailling switch in all lines in yards etc. complete to ensure continuous and complete linkage of track in the yard as per yard plan.	7.4%	
			1.10.5	Ballast laying to facilitate lifting of track, making of full ballast cushion and profile, distressing of long welded rails, machine tamping of track.	11%	
			1.10.6	Transportation/shifting of Rails.	1.25%	
			1.10.7	Miscellaneous items like provision of all type of boards, posts, painting of boards/posts, fouling mark, trolley inspection, trolley refuges, painting of reference post, fixing dead ends, etc, complete as per IRPWM .	0.29%	
			1.10.8	TRR with 20 Rail panels with 1st & 2nd tamping including trucking and stacking out released rails at specified location	5%	
			1.10.9	USFD tests and CRS Commissioning works.	5%	
			1.10.10	Dismantling of existing track including rail, sleepers, points and crossings all complete and shifting of dismantled material at the desired location by Authority/Authority Engineer to ensure handing over the dismantled material to Authority.	0.06%	
			Total:		100%	



Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
1.11	Tunnels	NA	1.11.1	On completion of tunnel portals including protection of earth slopes above and around portals.	-	(a) Cost of each tunnel shall be determined on pro rate basis with respect to the total linear length of all tunnels. (b) Payment shall be made on completion of each stage of a tunnel as per the weightage given in this schedule.
			1.11.2	On completion of tunnelling including all activities of drilling, blasting or use of TBM etc. complete with final lining.	-	
			1.11.3	On completion of tunnel safety works and tunnel ventilation works.	-	
			1.11.4	On completion of track works inside the tunnel.	-	
				Total:	100%	
1.12	Other Engineering works	14.00%	1.12.1 (a)	Construction of platforms including platform fencing/Wall but excluding items mentioned in item no 1.12.1(b) and (c) as per yard diagram.	7%	For 1.12.1 (a), (b), (c) unit of measurement is square metres, Payment shall be made on pro rata basis on completion of each platform. 1.12.2 Every item is equal weightage and Unit of measurement is linear length. Payment shall be made on pro rata basis with respect to the total length on completion of work. 1.12.3 Unit of measurement is linear length including landings and stairs. Payment shall be made on completion of a foot over bridge on pro rata basis with respect to the total length of all foot over bridges. <i>Note: - For the Foot Over Bridge, mentioned in table in clause 1.9 of Annexure I (Schedule B) in description of Railway Project, foundation work i.e. deep foundation (up to pile cap)/ open foundation, will be paid in BOQ items as per schedule given in Schedule: G1A. And,</i>
			1.12.1 (b)	Surfacing of platform with [kota stone/ CC] including passenger amenities.	2%	
			1.12.1 (c)	Provision of platforms including shelters	4.46%	
			1.12.2	Water supply, sewer line, approach road, fencing and electrification.	7%	
			1.12.3	Foot over bridges on railway stations and pedestrian foot over bridges at other locations	3.80%	
			1.12.4	Construction of railway station buildings and service buildings complete in all respects including fixing doors, windows, sanitary, water supply works, electrification, lifts, escalators and all other specified and incidental works	18%	
			1.12.5	Construction of staff quarters complete in all respects including fixing doors, windows, sanitary, water supply works, electrification,	19.20%	



Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
				lifts, escalators and all other specified and incidental works		<i>Substructure and Superstructure will be paid in this item 1.12.3.</i>
			1.12.6	On completion of circulation area, parking area, boundary wall, internal roads, drainage, water supply works including bore well, pump house, power supply, lighting, landscaping and all other incidental works in railway station/colony area.	1.80%	<p>1.12.4 Unit of measurement is plinth area in square metres. For the buildings having more than one storey, the total area shall be found out by adding the area of each storey. Unit cost shall be determined on pro rata basis with respect to the total area of all stations and service buildings.</p> <ul style="list-style-type: none"> • 50% Payment shall be paid after completion of structural works i.e. beam, columns & slab in case of framed structure or walls & slabs in case of other buildings and • 30% Payment shall be paid after completion of finishing and • 20% Final completion of works in all respects ready for use. <p>1.12.5 Unit of measurement is plinth area in square meters. For the staff quarters having more than one storey, the total area shall be found out by adding the area of each storey. Unit cost shall be determined on pro rata basis with respect to the total area of all staff quarters. 50% Payment shall be paid after completion of structural works i.e. beam, columns & slab in case of framed structure or walls & slabs in case of other buildings. 20% will be paid after completion of indoor works including water and sanitary works, flooring work.</p>
			1.12.7	Boundary walls, boundary pillars, fencing, roads, footpaths in block sections		
			1.12.7.1	Boundary walls	5.50%	
			1.12.7.2	Boundary pillars		
			1.12.7.3	Fencing		
			1.12.7.4	Roads	21.70%	
			1.12.7.5	Footpaths		
			1.12.8	Signage, information boards and posts	0.04%	
			1.12.9	Drainage along the railway line	8.70%	
			1.12.10	Compulsory afforestation and tree plantation	0.10%	
			1.12.11	Dismantling of existing Building & Platform and other associated works and shifting of dismantled material at the desired location by Authority/Authority Engineer to ensure handing over the dismantled material to Authority.	0.70%	



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
						<p>30% will be paid after Final completion of works in all respects ready for use.</p> <p>1.12.6 Payment shall be made on pro rata basis on completion of these works for the area and buildings covered as completed works for stage payment under Items 1.12.4 and 1.12.5.</p> <p>1.12.7 Unit of measurement is linear length. Payment shall be made on pro rata basis with respect to the total length on completion of work in a block section.</p> <p>1.12.8 Unit of measurement is linear length. Payment shall be made on pro rata basis with respect to the total length on completion of installation of all signage, boards and posts in a block section.</p> <p>1.12.9 Unit of measurement is linear length. Payment shall be made on pro rata basis with respect to the total length on completion of work in a block section.</p> <p>1.12.10 Payment shall be made for surviving plants, at least two years old, on pro rata basis with respect to the specified number of plants.</p> <p>1.12.11 Unit of measurement shall be on pro rata basis with respect to the total dismantling quantity i.e. 50% payment on dismantling & 50% payment on shifting of dismantled material at the location</p>



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
						decided by the Authority Engineer/Authority.
				Total:	100%	
1.13	Transportation/shifting of Rails	Item included with Track Payment	1.13	Transportation/shifting of Rails	%	The payment shall be made on basis of actual work done as per [SOR] rates. The details of rates are mentioned in annexure- I of schedule-B
				Total:	%	
1.14	Inventory for civil & Track works	2.00%	1.14	Supply of material as per the inventory	100%	On completion of supply of full inventory at least three months before the issue of the Provisional Certificate.
				Total:	100%	
1.15	Successful completion of Integrated testing and commissioning.	2.00%	1.15	Successful completion of Integrated testing and commissioning (Civil, Track, Electrical and S&T works).	100%	On issue of Completion Certificate. In case the Completion Certificate is for part of the Railway Project, the payment shall be made for the route km covered by the Completion Certificate pro rata to the total route km for the Project.
				Total:	100%	
1.16	Providing Site Office	0.20%	1.16	Completion of Site Office House with all office equipment including survey equipment and furniture etc.	100%	60 % payment shall be made for completing the civil work of a building cum office and mess facility including water supply and sanitation arrangements. Balance 40% payment shall be made for office equipment and furniture.
				Total:	100%	
1.17	Providing Vehicle	0.30%	1.17	Providing 6 Nos. vehicles (AC) in a month for 24 month & Multi Utility vehicles 6 nos. for 24 months.	100%	Payment shall be made every 21 vehicle months. For balance vehicle months if any payment shall be made on a pro-rata basis. Details of vehicles are mentioned in clause 5.3 of Schedule C of this EPC document.
	Total:	83.60%		Total:	100%	



2.0 Signalling and telecommunication works:

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
S&T Items	2.1 Electronic Interlocking System	2.70%	2.1.1	Design, submission and approval of Route Control Chart, Logic Application and Interface circuit, cable route plan, cable core plan, location drawing and survey.	1.90%	100% Payment shall be made after submission and getting approval of all drawings, circuit etc.
			2.1.2	Supply of complete Electronic Interlocking system including Relays and Installation & testing and commissioning of Electronic Interlocking system along with associated indoor work, Class A Surge Arrestor, Ring Earth by contractor and verified by Railway Engineer.	98.10%	80% Payment shall be made on completion of Supply and 20% payment shall be made on completion of Integrated testing & commissioning.
	2.2 S&T Cables and Materials.	2.80%	2.2.1	Delivery of S&T Cables and Execution.	93.30%	80% payment shall be made on completion of supply and 20% payment shall be made on commissioning of section
			2.2.2	Delivery of cable protection item e.g. duct, pipe and provision of route marker.	6.70%	80% payment shall be made on completion of supply and 20% payment shall be made on commission of section.
	2.3 Indoor Equipments, (HASSDAC, BPAC, IPS, Data-logger, ELD, fuse alarm, fire alarm system)	0.90%	2.3.1	Supply, installation and commission of all equipments.	100%	[80%] Payment shall be made on completion of Supply and [20%] payment shall be made on completion of Integrated testing & commissioning.
	2.4 Outdoor signaling equipments (Location	0.60%	2.4.1	Supply, installation and commission of all equipments	100%	[80%] Payment shall be made on completion of Supply and [20%] payment



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
	boxes, signals, signal LEDs, outdoor relays, point machines, Ground fittings earthing equipments, track batterie and Misc. boards.					shall be made on completion of Integrated testing & commissioning.
	2.5 Telecom indoor work including installation and commissioning of OFC hut to enable OFC and Quad cable communication between stations , telephone and passenger amenities.	0.75%	2.5.1	Indoor Telecom items like STM/MUX/power bank/PA system /mounting racks/ telephones, digital and GPS based clock.	100%	[80%] Payment shall be made on completion of Supply and [20%] payment shall be made on completion of Integrated testing & commissioning
	2.6 Miscellaneous Works	0.03%	2.6.1	Miscellaneous works like painting and lettering of S&T gears, temporary work of PNI/ NI & other required patching work for commissioning of the station.	100%	Payment shall be made on commission of section.
	2.7 S&T inventory	0.30%	2.7.1	Completion of the entire supply and delivery of inventory spare including tools & Plant, furniture for maintenance staff at nominated locations.	100%	Payment for inventory shall be made on commissioning.



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
	2.8 Maintenance of Assets.	0.02%	2.8.1	Maintenance and troubleshooting of S&T gears and assets for three months from the date of commissioning.	100%	100% Payment on completion of 3 months period of maintenance of sections, S&T gears after commissioning of section.
Total:		8.10%				

3.0 Railway Electrification Works

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
1	Overhead Equipment Work	6.00%	1.1	Completion of Design & drawing and Foundation work for block sections including stations and yards.	16.49%	<p>Payment for each stage shall be made after completion of a previous stage for a Section and its yards, measured in track kilometre (TKM) pro rata with reference to the total TKM.</p> <p>Note:- In case completion of work in any yard is delayed on account of Authority, work of yard may be delinked from the rest of the section with approval of CEE (C) for the purpose of payment</p> <p>For item 1.2 and 1.5 of stage payment, payment for supplies for additional sections, to the extent of maximum 10% of the total TKM, in addition to the</p>
			1.2	Supply of steel (Mast and Portals components only).	21.03%	
			1.3	Completion of Steel erection (Mast & Portal) & grouting with painting of location Numbers.	1.28%	
			1.4	Completion of erection of Bracket, Guy Rod, anticreep (Complete pre wiring activity), Height gauge & protection screen.	12.70%	
			1.5	Supply of Contact & Catenary wire only.	29.56%	



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
			1.6	Completion of wiring along with erection of balance weight, dropping & clipping including antitheft charging.	18.54%	payment admissible under item 1.0 above may be done. Payment against supplies under this item shall be made for quantities as per the approved layout, on receipt of material at contractor depot and production of inspection certificates and other documents and against BG of equivalent amount. Note: payment made for additional supplies under these items shall not be counted for completion of Project milestone under schedule-I. For item No. 1.6 Stage payment will be released on completion of work under item no. 2.1. For item 1.7 stage payment will be released on completion of work under item 2.5 and completion of AT work including extension of power supply to CLS panel in all respect as given in the scope of work.
			1.7	Commissioning.	0.40%	
				Total:	100%	
2	Switching Posts	1.60%	2.1	Design, Drawing, Earth work (including filling/cutting, compaction), completion of all Equipment - Foundations and all civil work of SWS like structure foundation, fencing.	5.72%	Payment shall be made for each stage after completion of all the switching posts work for a Section and its yards, measured in number of switching posts on pro rata basis with reference to the total switching posts for the Railway Project.
			2.2	Supply and Erection of steel structures complete.	5.38%	
			2.3	Supply and erection of all equipments including electrical switchgears & control panels, SP, bus-bar, ATs except Auto-transformers.	32.16%	
			2.4	Supply and Erection of Auto Transformers.	53.71%	



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
			2.5	Completion of Testing, commissioning and charging of SSP including all miscellaneous items, EIG certification.	3.03%	
				Total:	100%	
3	Booster Transformer and Return Conductor	Deleted	3.1	Completion of all works including testing.	0%	Payment shall be made for each stage after completion of each booster transformer and related work on pro rata basis with reference to the total of the booster transformers for the Railway Project.
			3.2	Commissioning.	0%	
				Total:	0%	
4	Auxiliary Transformer Stations	Already covered in item 1	4.1	Completion of all works including testing.	0%	Payment shall be made for each stage after completion of each auxiliary transformer station and related work on pro rata basis with reference to the total of the auxiliary transformer stations for the Railway Project.
			4.2	Commissioning	0%	
				Total:	0%	
5	Traction Sub-Station (TSS)	Deleted	5.1	Completion of all civil works for the TSS (works like earth filling, retaining wall, approach road, control building, fencing.	0%	Payment for each stage shall be made after completion of all the TSS work measured in number of TSS on pro rata basis with reference to the total TSS for the Railway Project.
			5.2	Completion of all supply and erection works of TSS except supply and erection of Transformers.	0%	
			5.3	Supply and erection of transformers.	0%	
			5.4	Completion and Commissioning of TSS and charging at 25 KV.	0%	
				Total:	0%	



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
6	High voltage Transmission Line Overhead from grid sub-station to TSS	Deleted	6.1	Completion of erection of all towers/poles associated with a TSS.	0%	Payment shall be made for each stage after completion of each transmission line overhead and related work. The unit of measurement is linear metre on pro rata basis with reference to the total length of all the transmission line overhead for the Railway Project.
			6.2	Stringing of conductors.	0%	
			6.3	Commissioning.	0%	
				Total:	0%	
7	Underground High Tension Cable Transmission Line	Deleted	7.1	Completion of cable trench and laying of cable.	0%	Payment shall be made for each stage after completion of each underground high tension cable transmission line. The unit of measurement is linear metre on pro rata basis with reference to the total length of all the underground high tension cable transmission line for the Railway Project.
			7.2	Commissioning.	0%	
				Total:	0%	
8	Bay Augmentation work at Grid Sub-Station/Terminal Arrangement at TSS	Deleted	8.1	Completion of erection including testing.	0%	Payment shall be made for each stage after completion of each bay augmentation work at grid sub-station/terminal arrangement at TSS. The unit of measurement is unit on pro rata basis with reference to the total of all the bay augmentation work at grid sub-station/terminal arrangement at TSS for the Railway Project.
			8.2	Commissioning.	0%	
				Total:	0%	
9	SCADA	0.04%	9.1	Supply and erection of SCDA at remote control centre at division.		Payment shall be made after completion of the work of each stage.
			9.1.1	Supply and erection of remote terminal units at switching post/ TSS.	95%	For item no. 9.1.1, payment shall be made after completion of work at all switching posts & TSS.
			9.1.2	Final Commissioning of SCADA at RCC and switching post/TSS.	5%	For item no. 9.1.2, payment shall be made after final commissioning of the system.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
				Total:	100%	
10	Automatic Fault Locator (AFL)	0.06%	10.1	Supply, erection, testing and commissioning of Automatic Fault Locator including Measuring Unit (MU).		Payment shall be made after completion of the work of each stage.
			10.1.1	Supply, erection, testing of Automatic Fault Locator Panel for SSP including one number of Measuring Unit (MU).	95%	For item no. 10.1.1, payment shall be made after completion of work at switching post.
			10.1.2	Commissioning of Automatic Fault Locator Panel for SSP including one number of Measuring Unit (MU).	5%	For item no. 10.1.2, payment shall be made after final commissioning of the system at switching post.
				Total:	100%	
11	Various electrical general services works and Extension of LT power supply for CLS Work	0.60%	11.1	Electrification of FOBs, Platforms etc and associated works	30.19%	For item no. 11.1, payment shall be made after completion of electrification of all FOB and Platforms covered in the scope of work.
			11.2	Electrification of Station Buildings.	38.85%	For item no. 11.2, payment shall be made after completion of electrification of all station buildings covered in the scope of work.
			11.3	Electrification of Approach road, circulating area etc.	14.00%	For item no. 11.3, payment shall be made after completion of electrification and associated works covered in the scope of work.
			11.4	Electrification of Staff quarters.	10.11%	For item no. 11.4, payment shall be made after completion of electrification of all staff quarters covered in the scope of work.
			11.5	Provision of CLS Panel at 3 Stations Building (5kVA at 2 stations and 25kVA at 1 station) Completion of work including testing & Commissioning.	6.85%	For item no. 11.5, payment shall be made after completion of price schedule 4 in all respect.
				Total:	100%	



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
12	Modification of HT power lines and crossings (raising of height)	Deleted	12.1	Completion of work including testing.	0%	Payment shall be made after completion of all work of a HT power line crossing, on pro-rata basis with reference to the total number of HT power line crossings.
			12.2	Commissioning	0%	
				Total:	0%	
13	Modification of HT power lines and crossings (replacement by UG cabling)	Deleted	13.1	Completion of work including testing.	0%	Payment shall be made after completion of all work of a replacement of HT power line crossing by UG cabling, on pro-rata basis with reference to the total number of replacements of HT power line crossing by UG cabling.
			13.2	Commissioning.	0%	
				Total:	0%	
14	Modification of LT power lines and crossings (replacement by UG cabling)	Deleted	14.1	Completion of work including testing.	0%	Payment shall be made after completion of all work of a replacement of LT power line crossing by UG cabling, on pro-rata basis with reference to the total number of replacements of LT power line crossing by UG cabling.
			14.2	Commissioning	0%	
				Total:	0%	
15	Extension of LT power supply for CLS Work	Already covered in item 11	15.1	Completion of work including testing.	0%	Payment shall be made after completion of all work at 5 locations, on pro-rata basis with reference to the total number of locations.
			15.2	Commissioning.	0%	
				Total:	0%	
16	Extension/Augmentation of general power supply	Deleted	16.1	Completion including commissioning.	0%	Payment shall be made after completion of the work.
				Total:	0%	
17	Modifications of existing electrical works	Deleted	17	Modification of existing electrical works including all associated works and testing at existing.	0%	Payment shall be made for completion of work at every 5 (five) locations on pro-rata basis with reference to the total number of locations. It will be made separately for SP, OHW, and TSS.
			17.1	Switching posts	0%	
			17.2	OHE works	0%	
			17.3	TSS	0%	



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
				Total:	0%	
18	Inventory electrical	Deleted	18.1	Supply of tools, equipment, Materials for supply to stores	0%	Payment shall be made on completion of the supply of the entire inventory items.
				Total:	0%	
19	Signalling System Modification	Deleted	19.1	Modification of existing signalling system (except supply and Installation of Signalling Cables) including survey, design, supply, installation, testing, supply of manuals for each place, supply of as made drawings (wiring diagram of location, relay room, circuit, SIP, selection table, cable route plan), testing and measuring tools and equipment and commissioning at		For item No. 19.1. 1 and 19.1.2 payment for each stage shall be made on completion of work at a location on pro rata basis with respect to the total number of locations 95% of respective stage payment may be made on supply of concerned Drawings and approval thereafter by Railway and commissioning of associated works. Balance 5% to be linked with supply of as made drawing.
			19.1.1	PI/RR/El systems	0%	
			19.1.2	LC gate	0%	
			19.2	New Panel Interlocking/ Route Relay Interlocking(except supply and Installation of Signalling Cables) including survey, design, supply, installation, testing, supply of manuals for each place, supply of as made drawings (wiring diagram of location, relay room, circuit, cable route plan), testing and measuring tools and equipment and commissioning at		For item No. 19.2.1. Payment for each stage shall be made on completion of work at [5 (five)] wayside stations on pro rata basis with respect to the total number of wayside stations For item No. 19.2.2. Payment for each stage shall be made on completion of work at [2 (two)] Major/Junction stations on pro rata basis with respect to the total number of Major/Junction stations
			19.2.1	Way side stations	0%	
			19.2.2	Major/Junction stations	0%	
			19.3	Diversion of utilities	0%	
			19.4	Supply and Installation of Signalling Cables	0%	For item no 19.2.1 and 19.2.2 95% of respective stage payment may be made on supply of concerned Drawings and approval thereafter by Railway and commissioning of associated works. Balance 5% to be linked with supply of as made



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
						<p>drawing</p> <p>For Item No. 19.3 Payment shall be made on completion of the entire work</p> <p>19.4 [80%] payment shall be made on completion of supply and [20%] payment shall be made on completion of installation work between two stations on pro rata basis with respect to total track kilometre (TKM) length.</p> <p>For item No. 19.4 payment for supplies, to the extent of maximum [10%] of the total quantity involved in scope of work may be done. Payment against supplies under these items shall be made for quantities as per the approved layout, on receipt of material at contractor depot and production of inspection certificates and other documents and against BG of equivalent amount. Note: payment made for supplies under these items shall not be counted for completion of Project milestone under schedule-I.</p>
				Total:	0%	
20	Signalling Inventory	Deleted	20.1	Completion of the entire supply of inventory at nominated locations	0%	Payment shall be made after completion of the signalling work item 18 above. There will not be any payment for part supply of inventory.
				Total:	0%	
21	Integrated testing and commissioning of Signalling works	Deleted	21.1	Integrated testing and commission of Signalling works and supply of as made drawings	0%	Payment shall be made after issue of Provisional Acceptance Certificate. In case the Provisional Acceptance Certificate is for part of the railway Project, the Payment shall be made for the route



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Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
						Km covered by the Provisional Acceptance certificate on pro rata basis with respect to the total route Km of the Project.
				Total:	0%	
22	Telecommunications modifications	Deleted	22.1	Cable works		For item No. 21.1.1 Unit of measurement is section. Payment shall be determined on pro rata basis on track rout km completed on pro rata basis with respect to total route km to be completed as per the final design.
			22.1.1	Sections with existing optical fibre cable and quad cable. Completion of the work specified in Schedule B, Annex I.		
			22.1.2	Sections without optical fibre cable and quad cable. Completion of the work specified in Schedule B, Annex I.		For item No. 21.1.2 Unit of measurement is section. Payment shall be determined on pro rata basis on track rout km completed on pro rata basis with respect to total route km to be completed as per the final design.
			22.2	Quad cable work including survey, design, supply, installation, testing, supply of manuals for each place, supply of as made drawings (cable core plan and numbering scheme, schematic and wiring diagram, cable route drawing) , and commissioning of 6 Quad telecom cable system.		For Item No. 21.2Payment shall be made on completion of each set of [1 (one)] section (cable hut to cable hut including station connected) on pro rata basis with respect to the total number of sections.
			22.3	Optical fibre cable including Survey, design, supply installation, testing, supply of manuals for each place, supply of as made drawings (layout in equipment rack, channelling plan, schematic and wiring diagram), and commissioning of optical fibre cable communication system.		For Item No. 21.3 Payment shall be made on completion of each set of [1 (one)] section (cable hut to cable hut including station connected) on pro rata basis with respect to the total number of sections.
			22.4	Modification in passenger amenity works		95% of respective stage payment may be made on supply of concerned Drawings and approval thereafter by Railway and commissioning of



Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
						associated works. Balance 5% to be linked with supply of completion drawing For item No. 21.4 Payment shall be made on completion of each set of [1 (one)] location on pro rata basis with respect to the total number of locations.
				Total:	0%	
23	Telecommunication inventory	Deleted	23.1	Completion of the entire supply of inventory at nominated locations	0%	Payment shall be made after completion of the signalling work item 21 above. There will not be any payment for part supply of inventory.
				Total:	0	
24	Integrated testing and commissioning of Telecommunication works	Deleted	24.1	Integrated testing and commission of the Telecommunication works and supply of as made drawings.	0%	Payment shall be made after issue of Provisional Acceptance Certificate. In case the Provisional Acceptance Certificate is for part of the railway Project, the Payment shall be made for the route Km covered by the Provisional Acceptance certificate on pro rata basis with respect to the total route Km of the Project.
				Total:	0%	
25	Civil Engineering works	Deleted	25.1	Completion of buildings (staff quarters, service buildings) including sanitation, electricity, water supply and final handing over of building.	0%	For item No. 24.1 Unit of measurement is plinth area in square metres. For the staff quarters having more than one storey, the total area shall be found out by adding the area of each storey. Unit cost shall be determined on pro rata basis with respect to the total area of all staff quarters/service buildings. 50% payment shall be paid after completion of structural works i.e. beam, columns & slab in case of framed structure or walls & slabs in case of other buildings and 50% final completion
			25.2	Completion of tower wagon shed including siding, sanitation, electricity, water supply and final handing over of building.	0%	
			25.3	Completion of trip shed including siding,	0%	



Item		Weightage in percentage to the Contract Price	Stage for Payment		Percentage weightage	Payment Procedure
				sanitation, electricity, water supply and final handing over of building.		of works in all respects ready for use.
			25.4	Completion of FOB modification works in all respects.	0%	For item No. 24.2 and 24.3 payment shall be made after completion of the work in all respects
			25.5	Completion of ROB modification works in all respects.	0%	For item No. 24.4 unit of measurement is linear length including landings and stairs. Payment shall be made on completion of modification work of a FOB on pro rata basis w.r.t total length of all FOBs For item No. 24.5 Cost of each ROB shall be determined on pro rata basis with respect to the total linear length (m) of the two lane ROB including approaches. For ROB other than two lane, a multiplying factor in proportion to number of lanes shall be applied. Payment shall be made on completion of modification work of an ROB including approaches complete in all respects and fit for use.
	Total:	8.30%		Total:	0%	
	Total:	100%				

Note: - For inter se ranking of offers considering Capitalization of Transformer losses:

- The inter se ranking of the offer will be arrived after adding the quoted rate for tender by the tenderers and present value of the losses of all transformers and auto transformers as per formula for capitalization of transformer losses given in RDSO specification.



- ii. As per Specification No. TI/SPC/PSI/TRNPWR/4200 (for V connected transformer), TI/SPC/PSI/TRNPWR/5200 (for Scott connected transformer) and Specification No. TI/SPC/PSI/AUTOTR/1201, formula for Capitalization of Transformer and auto transformer losses shall be used for the purpose of calculating the present worth of transformer after taking into account capitalization of its losses.
- iii. The value of K which is capitalised value of transformer losses (the present value of transformer losses in Rupees as per formula given in RDSO specification) will be added to all-inclusive unit rates quoted by firm for ascertaining inter se ranking of the offers and for deciding the tender.
- iv. Values of n (Life of Transformer) will be taken as INJ years, F (Load Factor) as [F] percent and T (Tariff) as Rupee [T] per Kwh.
- v. Firm should indicate the value of parameters-Maximum No- Load Loss in watt (I) and Maximum Load - Loss in watt (C) in their offer and shall compute the capitalised value of transformer losses (K) for all the transformers and furnish with the offer.
- vi. In case the bidder fails to indicate the losses with their offer as explained in v above, maximum value of losses as per RDSO Specification No. TI/SPC/PSI/TRNPWR/4200 for V connected power transformer, RDSO TI/SPC/PSI/TRNPWR/5200 (for Scott connected transformer) and RDSO Specification No. TI/SPC/PSI/AUTOTR/1201 for auto transformer shall be considered for calculation of value of K.



Annexure

Schedule G-1

Separate BOQ

for

Itemised Work



SCHEDULE–G1

Contract Price Weightages (For BOQ Items)

1. The Contract Price for this schedule (G1) of Agreement is Rs. 108,17,53,056/-.
2. Schedule G1 consists of three parts as under of which any or all schedules may be used as per the requirement. However, main schedule (G1A/G1B/G1C) may be bifurcated into item wise i.e. G1A - may be bifurcated broadly into foundation & sub-structure and further into pile, well and column, wall for clarity and other items as required. Similarly G1B & G1C may also be bifurcated.
 - a. **Schedule G1A for Bridge Foundation, Substructure Works, FOB, Soil Stabilization, Dry Stone Pitching and JCB Hiring** (Classification as per Article 17.8.5 **Rs. 89,39,61,814/-**)
 - b. **Schedule G1B for Utility shifting** (Classification as per Article 17.8.5 **Rs. 77,91,242/-**).
 - c. **Schedule G1C for Unforeseen works (Rs. 18,00,00,000/-).**
3. Rate should be quoted (% above/Below/at par) for schedule of G1. No Separate rates should be quoted for schedule G1A, G1B & G1C. Example:

Schedule	Item	Quantity	Amount	Total Amount of Schedule G1	Rate quoted (% above/Below/at par)
G1A	***	@@@	\$\$\$	\$\$\$	}
	***	@@@	\$\$\$		
	***	@@@	\$\$\$		
	***	@@@	\$\$\$		
G1B	***	@@@	\$\$\$		
	***	@@@	\$\$\$		
	***	@@@	\$\$\$		
	***	@@@	\$\$\$		
G1C	***	@@@	\$\$\$		
	***	@@@	\$\$\$		
	***	@@@	\$\$\$		
	***	@@@	\$\$\$		



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Schedule G1A: Bridge Foundation, Substructure Works, FOB, Soil Stabilization, Dry Stone Pitching and JCB Hiring:

S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
Schedule -A "USSOR 2021"							
1	011030	Schedule	Earthwork in filling in embankment, guide bunds, around buried type abutments, bridge gaps, trolley refuges, platforms etc. with contractor's own earth conforming to Soil Quality Class SQ1/SQ2/SQ3, after preparation of foundations as applicable, benching in existing banks wherever required, spreading in layers with motor grader, bringing the moisture content to OMC, mechanical compaction to specified density and dressing of bank to final profile as per RDSO Specifications: RDSO/2020/GE: IRS-0004 with latest correction slips. Note: 1) Foundation preparation, Benching including additional earthwork on account of this, wherever required, shall be paid extra under relevant schedule item for benching. 2) Payment for Earthwork under this item shall be made based on the cross section measurements calculated (i) with original ground profile of existing bank based on initial ground levels before doing benching and (ii) final profile of the bank worked out with final levels as per prevailing guidelines.				
1.1	011031	Schedule	Using Soil Class SQ1	Cum	5,998.501	188.26	11,29,278
2	021020	Schedule	Exploratory drilling of Boreholes down to required depth, drilling of 150mm diameter boreholes in all type of soils except hard rock and large boulders (boulder core more than 30cm), including refilling, reinstating surface and disposing of surplus material including use of mechanical rigs with power operated winches as well as percussion / chiseling tool for advancing through occasional seams of hard strata to be employed where necessary in River bed area including standing/flowing water with all necessary arrangements except making of platform under water which shall be paid under relevant item of SOR.				
2.1	021021	Schedule	0m to 10m	Meter	540.000	1,278.00	6,90,120
2.2	021022	Schedule	10m to 20m	Meter	360.000	1,342.22	4,83,199
2.3	021023	Schedule	20m to 30m	Meter	220.000	1,412.86	3,10,829
3	021130	Schedule	Conducting standard penetration test as per IS:2131 at approximate 1.5m intervals in bore holes, as directed by the Engineer in charge	Each	88.000	802.76	70,643
4	021140	Schedule	Collection of water samples at required intervals	Each	33.000	227.45	7,506
5	021150	Schedule	Conducting laboratory Tests on collected soil samples as per relevant IS code				



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S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
5.1	021151	Schedule	Moisture Content/Dry Density	Each	44.000	267.59	11,774
5.2	021152	Schedule	Atterberg Limits	Each	44.000	535.18	23,548
5.3	021153	Schedule	Specific Gravity	Each	44.000	535.18	23,548
5.4	021154	Schedule	Grain size analysis including Hydrometer analysis	Each	44.000	735.87	32,378
5.5	021155	Schedule	Direct Shear Test	Each	44.000	2,006.91	88,304
5.6	021156	Schedule	Natural Density	Each	44.000	602.07	26,491
5.7	021158	Schedule	Unconfined Compression Test	Each	44.000	2,006.91	88,304
5.8	021159	Schedule	Triaxial Test	Each	44.000	2,006.91	88,304
6	021060	Schedule	Conducting in-situ full size Plate Load Test (PLT) at selected location as per IS:1888 including making loading arrangements & casting of RCC/cast in-situ concrete footing as per codal provisions including excavation and refilling of the trial pit.				
6.1	021061	Schedule	Plate size 30cm x 30cm	Each	35.000	20,069.06	7,02,417
7	021070	Schedule	Conducting in situ Vane shear test for soil as per IS:4434	Each	22.000	2,943.46	64,756
8	021080	Schedule	Conducting SCPT for soil as per IS:4968	Each	22.000	46,827.82	10,30,212
9	021090	Schedule	Conducting DCPT for soil as per IS:4968	Each	22.000	38,800.19	8,53,604
10	021100	Schedule	Conducting determination of California Bearing Ratio as per IS:2720	Each	44.000	1,337.94	58,869
11	021170	Schedule	Conducting chemical analysis of ground water samples to determine suitability for concreting and aggressiveness in relation to attack on concrete / reinforcement including determination of pH value.	Each	33.000	1,337.94	44,152
12	021180	Schedule	Conducting chemical analysis of soil samples to determine aggressiveness in relation to attack on concrete / reinforcement including determination of pH value	Each	22.000	1,337.94	29,435
13	022070	Schedule	Providing Fixing Weep Holes in Abutment , wing walls & Return wall etc. of new bridges with 110mm dia UPVC pipe Type A ISI marked with all contractor men material transportation all taxes as per specification and as directed by engineer-in-charge	Meter	2,753.695	231.70	6,38,031
14	022120	Schedule	Conducting load test of a single pile up to specified capacity in accordance with IS:2911 (Part-IV) including installation of loading platform and preparation of pile head or construction of test cap and dismantling of test cap after test etc. with all labour, material, tool & plants, equipment, machinery, etc. complete as per drawing and specification, as directed by the Engineer.				
14.1	022122	Schedule	Initial load test above 50 ton and up to 100 T capacity pile	Each	20.000	61,672.84	12,33,457
14.2	022126	Schedule	Routine load test above 50 ton and up to 100 T capacity pile	Each	20.000	30,836.42	6,16,728
15	022130	Schedule	Lateral load testing of single pile in accordance with "IS Code of practice IS:2911 (Part-IV) for determining safe allowable lateral load of pile" with all				



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S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
			labour, material, tool & plants, equipment, machinery, etc complete as per drawing and specification as directed by the Engineer.				
15.1	022132	Schedule	Piles with lateral load capacity of above 50 ton and up to 100 ton	Each	20.000	29,086.76	5,81,735
16	022140	Schedule	Pulse Echo Test (PET) for integrity testing of piles with contractor's men, materials and machines. The rate includes cost of Inspection of site, preparation of pile head and any other unforeseen cost required for the test, submission of reports in triplicate as per satisfaction of the Engineer in Charge.	Each	336.000	2,809.67	9,44,049
17	051070	Schedule	Providing and laying Pitching with Stone Boulders, weighing not less than 35 kg each with voids filled with cement sand mortar 1:4 on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical Specifications (filter media to separately under the relevant item). Rate is excluding the cost of cement which shall be paid extra under the relevant item.	Cum	3,855.232	2,482.78	95,71,693
18	051080	Schedule	Providing and laying Filter Material as per RDSO Specifications underneath pitching in slopes complete as per drawing and Technical Specification.	Cum	1,036.557	2,756.95	28,57,736
19	052150	Schedule	Providing and laying of filter media consisting of granular materials of GW, GP, SW groups as per IS:1498 (latest) in required profile behind boulder filling of abutments, wing walls / return walls etc. above bed level with all labour and material complete job as per drawing and technical specification of RDSO Guidelines.	Cum	5,208.121	2,351.27	1,22,45,700
20	052260	Schedule	Dewatering of natural or accumulated water from any location. Payment to be done for Horsepower of pump multiplied by pumping hours.	HP Hour	400.000	40.58	16,232
21	053010	Schedule	Designing and developing Detailed structural and working Drawings for following items for ROB/RUB/Bridge based on Railway's approved GADs, duly collecting necessary data from Railways and R&B authorities, duly designing members and submission of check plot duly getting proofchecked by Railway approved institutes, submitting for Railway's verification and approval, making corrections duly incorporating suggestions in drawings/designs, further submission of original in transparent film paper and soft copy (CD) for Railways approval etc. with contractor's technical expertise and instruments, labour, consumables, repeatedly attending till final approval etc., complete as directed by Engineer in-charge				



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S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
21.1	053011	Schedule	Open / Pile / Well Foundation for piers/abutments	Set	19.000	24,417.36	4,63,930
21.2	053012	Schedule	RCC Bed Block	Set	19.000	7,592.80	1,44,263
21.3	053013	Schedule	Foundation and substructure for RCC retaining wall, abutment and approach slab	Set	19.000	23,748.39	4,51,219
22	211200	Schedule	Hiring of machinery for minor miscellaneous works for short duration including operator/driver, fuel, lubricants and consumable. The contractor shall arrange all statutory permits as required by rules and regulation prevailing in the area of work. Payment shall be made for actual working hours at site.				
22.1	211201	Schedule	JCB backhoe loaders 3DX Plus or similar with minimum 1.10. com bucket capacity	Hour	1,200.000	1,070.72	12,84,864
22.2	211202	Schedule	Hydra or similar tyre mounted pick and carry crane of 12T	Hour	50.000	836.21	41,811
22.3	211203	Schedule	Tractor trolly for local transportation or other misc. work	Hour	107.000	200.69	21,474
23	022090	Schedule	Boring, providing and installation of bored cast in-situ Reinforced Cement Concrete piles using Hydraulic piling Rig of specified diameter and length below pile cap of specified grade with Design Mix Cement Concrete, using 20mm graded crushed stone aggregate and coarse sand of approved quality, to carry a safe working load not less than specified, concreting by machine batching, machine mixing, scaffolding, using Admixture in approved proportion (as per IS:9103), placing with tremie pipe, chipping off of pile top to remove laitance concrete above cut off level etc., pumping and bailing out water complete in all respect as per approved drawing, specification and direction of the Engineer in charge. Note: 1. Payment for only cement, reinforcement shall be made extra. 2. Length of the pile for payment shall be measured up to the bottom of RCC pile Cap. 3. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons for not using plasticiser at the stage of Mix Design and in that case deduction shall be made as per relevant item.				
23.1	022095	Schedule	600mm diameter	Meter	1,040.000	2,795.39	29,07,206
24	025080	Schedule	Supply of steel reinforcement of approved brands/makes for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete.				
24.1	025082	Schedule	Thermo-Mechanically Treated bars of grade	Kg.			



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S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
			Fe-500D or more of approved brands/makes.		25,14,524.152	99.95	25,13,26,689
25	012010	Schedule	Earthwork in cutting in formation, trolley refuges, side drains, level crossing approaches, platforms, catch water drains, diversion of nallah & finishing to-required dimension and slopes to obtain a neat appearance to standard profile inclusive of all labour, materials, plant & machinery, leading all cut spoils either to make spoil dumps or for filling in embankment with leads within 2 km on either side of edge of the cutting(s) including all lifts, ascent, descent, loading, unloading, bailing & pumping out water, if required, clearance of site and all other works incidental thereto for completing the work as per ROSO Specification No. RDSO/2020/GE: IRS-0004 with latest updated correction slips and to the satisfaction of the Engineer-in-Charge. Note:(i) All usable earth arising from cut spoils shall be led into bank formation and Unusable spoils shall be dumped / stacked away from toe of embankment. (ii) All hard rock /and boulders not fit for filling will be stacked by the contractor and will be property of the Railways.(iii)Cut trees shall be property of Railways and to be deposited in the railway godown unless specified otherwise in the Conditions of Contract.				
26	012011	Schedule	In all conditions and classifications of soil except rock	Cum	60,000.000	212.07	1,27,24,200
27	052040	Schedule	Soil Stabilization: Supply and laying of coarse sand including consolidation with all labour, lead, lift, tools, plants, crossing of tracks as per drawing and technical specification as directed by the Engineer in charge in case loose slush is encountered at site of formation work, for foundation before casting the foundation or laying the filtering media.	Cum	60,000.000	1,983.85	11,90,31,000
28	051010	Schedule	Providing and laying Dry Stone Pitching 600 mm thick including supply of stone and preparing of surface on embankment slope, guide bund, spur, bridges abutment, wing wall etc. with all lead, lift, ascent, descent, track crossing etc.	Cum	80,000.000	1,621.09	12,96,87,200
29	051060	Schedule	Supplying, filling and pitching of stone boulders hand packed and surface leveled off to correct profile in thickness not less than 600mm as approved by Engineer in charge behind abutment, wings, return walls and pitching outside the floors and on bridge approaches and bank/sub bank complete as per approved plan and NS as directed by Engineer in charge including all royalty and taxes over boulder with all lead, lift, descend and crossing of river, channels, track and fencing complete with contractor's labours and	Cum	1,414.183	1,523.35	21,54,296



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S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
			materials and tools & plants.				
30		Schedule	Any Other items of USSOR -2021	Lump-Sum			51,00,000
Total of Schedule A							55,99,01,184.68
Schedule-B "DSR-2021"					-		
S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
1	4.1	DSR-2021	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :				
1.2	4.1.8	DSR-2021	1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum	29.900	6,326.05	1,89,146
1.3	4.1.3	DSR-2021	Providing C.C. M-15 in foundation of pier/abutment and retaining wall in 150mm thick layer with stone ballast of max. size 40mm and of approved quality and grading including fixing and removal of all shuttering/moulds with contractor's own materials excluding cement and including cost of all centering shuttering, plant and equipment labour, vibrating, tamping, curing finishing etc. complete job (Cement will be paid separately).	Cum	490.239	7,365.15	36,10,684
1.4	4.1.5	DSR-2021	Providing CC M-10 (1:3:6) with 40 mm stone aggregate, coarse sand and cement in lean concrete in foundation & flooring including bailing out or pumping of water and laying concrete under water if required, including supplying, fixing and removal of formwork, including cost of labour, shuttering. moulds, T&P, plants, materials (excluding cement) etc. complete with all lead, lift, ascend, descend, crossing of track, nallah, fencing, river etc. complete job cement will be paid separately).	Cum	1,014.663	6,833.40	69,33,597
2	4.2.2	DSR-2021	Providing CC/RCC M-20 in foundation of pier and retaining wall with coarse aggregate 20mm gauge, coarse sand and cement in well steining/retaining wall including supplying fixing and removing of formwork, curing as required with all leads, lifts, ascend/descend Xing of track, nallah, river and fencing all labour and materials excluding cost of cement as per specification (cement & steel will be paid separately).	Cum	4,632.488	9,793.75	4,53,69,429



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
3	5.33.1.3	DSR-2021	Providing CC/RCC M-30/35 with 20mm crushed stone aggregate, coarse sand & cement in bed block, ballast retainer, abutment, pier, pile cap etc. including supplying, fixing and removal of formwork, with all cost including bailing out or pumping of water and laying concrete under water if required, including cost of labour, shuttering, moulds, T & P, plants, materials (excluding cement and steel) etc. complete with all lead, lift, ascend, descend, crossing of track, nallah, fencing, river etc. complete job (Reinforcement and cement will be paid separately).	Cum	9,460.011	8,966.95	8,48,27,446
4	2.8	DSR-2021	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
4.1	2.8.1	DSR-2021	All kinds of soil	Cum	23,713.499	286.85	68,02,217
5	10.26.1	DSR-2021	Providing and fixing tumbler steel structural MS railing & Ladder of approved size by welding etc. to steel ladder railing, balcony railing, staircase railing and similar works, insert plate & lugs including applying priming coat of approved steel primer complete as per drawing and technical specification.	MT	21.960	1,57,150.00	34,51,014
6	4.3	DSR-2021	Centering and shuttering including strutting, propping etc. and removal of form work for :				
6.1	4.3.1	DSR-2021	Foundations, footings, bases for columns	Sqm	21,056.491	307.95	64,84,346
6.2	4.3.2	DSR-2021	Retaining walls, return walls, walls (any thickness) including attached pilasters, buttresses, plinth and string courses fillets, kerbs and steps etc.	Sqm	49,131.813	669.55	3,28,96,205
7		DSR-2021	Any Other items of DSR-2021	Lump-Sum			50,50,000
Total of Schedule B							19,56,14,084



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S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
Schedule-C "Non.Schedule"					-		
S. N.	Item Type		Description of works	Unit	Quantity	Rate	Amount
1	Non-scheduled		Construction of RCC BORED cast in situ piles 1.20m dia below the pile cap in all class of soil under sub soil water (if met) and in all types of soil as per approved plan including all operations, plants, machinery for making bored piles including the use of casing pipes if necessary using design mix concrete of grade M- 25/M-30.or any other design mix per 15: 12911, Part-1, seĉ. 2 & 3 Using cement coarse sand and stone chips 20mm and down gauge including all ascents ,descents, leads, lifts above/below ground level uncoiling, strengthening, cutting, hooking, bending, binding and placing in position all the reinforcement including cost of GI binding wire, cover blocks, mechanical mixing and vibrating of concrete, all labour and material as a complete job as per specifications including bailing/pumping out of water and use of bentonite as and when required complete as per the direction of Engineer. Note: - (Cement & steel will be paid separately). (1) The rate shall include temporary arrangements required to fulfill safety requirements. The work is to be executed in running traffic conditions, if required. (i) The continuity and integrity of the newly constructed piles will have to be checked by the contractor free of cost. (a) This item is for Depth up to 15 M	Meter	5,040.000	18,582.67	9,36,56,657
2	Non-scheduled		Construction of RCC bored cast in situ piles 1.20m dia below the pile cap in all class of soil under sub soil water (if met) and in all types of soil as per approved plan including all operations, plants, machinery for making bored piles including the use of casing pipes if necessary using design mixed concrete of grade M-25/M-30 or any other design mix as per IS: 2911, Part-1, sec. 2 & 3 using cement coarse sand and stone chips 20mm and down gauge including all ascents, descents, leads, lifts above/below ground level uncoiling, strengthening, cutting, hooking, bending, binding and placing in position all the reinforcement including cost of binding wire, mechanical mixing and vibrating of concrete, all labor and material as a complete job as per specifications including balling/pumping out of water and use of bentonite as and when required (Cement & steel will be paid separately).(i) The rate shall include temporary arrangements required to fulfill safety requirements. The work is to be	Meter	2,277.000	18,582.67	4,23,12,740



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S. N.	Item No.	Item type	Description of works	Unit	Quantity	Rate	Amount
			executed in running traffic conditions, if required.(ii) The continuity and integrity of the newly constructed piles will have to be checked by the contractor free of cost. a) This item is for depth More than 15 M & up to Founding level				
5	Non-scheduled		Supply and mixing the admixtures such as accelerator, retarders, grouting admixtures surface retarders, super plasticizers of approved quality with contractor's tools and plants. labour and materials including loading. unloading lead lift, descent, taxes, royalty, freight, incidental charges etc Complete as per specification and as directed by the Engineer- in- charge Admixtures shall be confirmed to IS 9103-1979 and shall be provided from recognized manufacturers such as FOSROC MC Bauchemie, Asian laboratories, ROFFE & PIDILITE Payment shall be made consumed quantity only	Litter	1,070.000	144.10	1,54,187
6	Non-scheduled		Stone Masonry (1:6) Cement : Sand	Cum	146.661	7,311.25	10,72,275
7	Non-scheduled		Conducting Cross Hole Ultrasonic Monitoring (CHUM/Cross Hole Logging (CSL)) test of piles with contractor's man and machine. The rate includes cost of inspection and site and other unforeseen cost required for test, submission of reports in triplicate as per the satisfaction of the Engineer in charge at site. Payment of required M.S. Steel reinforcement for fixing in position of M.S. pipe, MS plate etc. will be paid separately under relevant NS/USSOR items.	Each	85.000	14,713.96	12,50,687
Total of Schedule C							13,84,46,545
Schedule G1A: (For Bridge Foundation, Substructure Works, FOB, Soil Stabilization, Dry Stone Pitching and JCB Hiring)				Total Cost in Rs. :			89,39,61,814
				Say Rs. :			89,39,61,814
(Rupees Eighty Nine Crore Thirty Nine Lakh Sixty One Thousand Eight Hundred and Fourteen Only)							



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Schedule G1B: For Utility Shifting works

S. N.	Description of items	Unit	Approx Qty	Rates	Total Cost
A.	Electrical related works				
1	Supply & erection, of 12 Mtr Long hot deep galvanized and swaged type steel Tubular pole comprising bottom 5.8 mtr, middle, 3.1 mtr & top 3.1 mtr. Approx weight 313kg. (Designation 410SP-65) IS: 2713 Pt.-1 to 3/1980. (Latest version) in cement concrete 1:3:6 (1 cement:3 coarse sand:6 graded stone aggregate 40mm nominal size) foundation, including excavation & refilling. dressing up of the plinth etc. in all respect as required. (For 11/33 KV track crossing) (4 nos at each crossing)	Per No.	16	37,461.46	5,99,383.36
2	Supply and erection of 150 mm dia B class GI Pipe conforming to IS:1239, for cable protection along pole/wall/road/rail line crossing, including all fastener, complete in all respect. (for HT) (12 mtr at each crossing)	Per Mtr.	48	1,151.86	55,289.28
3	Supply of double walled corrugated (DWC) pipes for under ground power protection along with the socket /coupler and T joint with "IP 67" protection for coupling where ever required. The HDPE pipe shall be rodent proof and fire resistant and size of outer dia 200 mm/ inner dia 175 mm in the length of 6 meters as per RDSO specification RDSO/SPN/204/2011 ver 1.1 amndt 1 or latest. (80 mtr at each crossing)	Per Mtr.	320	337.00	1,07,840.00
4	All work pertaining to horizontal directional drilling (HDD/Boring) and trenchless laying of cable in boring under the track/road by using different sizes of pipe. The depth of horizontal boring of appropriate size (up to 200 mm) should be minimum 1.65 Mtr from rail flange/road level or required as per site. (20 mtr approx. at each crossing)	Per Mtr.	80	399.48	31,958.40
5	Excavation of cable trench of 1.6 Mtr depth and 1.0 Mtr wide (for 2 pipe laying) in all kinds of soil with in station limit & block section both for main & tail cables as per cable route chart to be given by engineer-at-site and its refilling with the same excavated soft soil. Note:-depth of the cable duct to be measured from the hard soil level of the ground. (30 m each crossing including loop)	Per Mtr.	120	156.74	18,808.80
6	Laying of 11/33 KV XLPE cable XLPE upto 300 mm sq. in G.I. Pipe 150 dia and in HDPE pipe (Fixing of G.I. Pipe will be covered item No) & clamping of the cable along the pole /with angle/horizontal bracing atleast 2 placed complete in all respect. (160 M on pole+440 in HDPE pipe including loop)	Per Mtr.	600	18.94	11,364.00



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S. N.	Description of items	Unit	Approx Qty	Rates	Total Cost
7	Supplying and commissioning of outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 185- 240 mm sq 3 core, XLPE aluminium conductor cable of 11 KV grade as required. (4 nos at each crossing)	Per No.	8	8,056.95	64,455.60
8	Supplying and commissioning of outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 240-300 mm sq 3 core, XLPE aluminium conductor cable of 33 KV grade as required. (4 nos at each crossing)	Per No.	8	23,320.00	1,86,560.00
9	Supplying and commissioning of straight through cable jointing with heat shrinkable jointing kit complete with all accessories including ferrules suitable for 185- 240 mm sq 3 core, XLPE aluminium conductor cable of 11 KV grade as required at site.	Per No.	1	11,588.40	11,588.40
10	Supplying and commissioning of straight through cable jointing with heat shrinkable jointing kit complete with all accessories including ferrules suitable for 240-300 mm sq 3 core, XLPE aluminium conductor cable of 33 KV grade as required at site.	Per No.	1	46,343.43	46,343.43
11	Supply, fabricating & fixing of top rolled steel channel of size 100mmx50mmx6mm thick with MS clamps of MS flat of size 50x6 mm bolts & nuts of suitable size. (11KV)	Per Mtr.	12	554.58	6,654.96
12	Supply, fabricating & erection of top rolled steel channel of size 125 mmx65mmx6mm thick with MS clamps of MS flat of size 50x6 mm bolts & nuts of suitable size .(for 33 KV Line)	Per Mtr.	12	717.95	8,615.40
13	Supply & fabricating 50 mm x 50 mm x 6 mm size angle iron for bracings of 'H' pole/4 pole, including 50x6 mm MS clamps & erecting it on existing/new pole complete in all respect.	Per Mtr.	120	380.76	45,691.20
14	Supply & erecting 11KV clevis & tongue type strain insulator set (Disc insulator) on pole comprising of cross arm straps & clevis type disc insulator 16mm dia cotter pin strain type strain clamps 16mm dia 170mm long bolts with nuts, spring washers, split pin 5mm dia plain washers etc. The strain insulator set should be as per Sketch No. DY.CEE/Con/BG/GKP/ STD/1/ 0492. (6 nos at each crossing)	Per No.	12	482.97	5,795.64
15	Supply & erection of 11KV pin insulator set with MS bolts & nuts on pole complete in all respect. (6 nos at each crossing)	Per No.	12	156.46	1,877.52
16	Supply & erection of 33 KV pin insulator complete with large steel head G.I pin nuts, washers etc complete in all respect. (6 nos at each crossing)	Per No.	12	569.25	6,831.00



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S. N.	Description of items	Unit	Approx Qty	Rates	Total Cost
17	Supply & erecting 33KV Ball & socket type strain insulator set with 4 disc (1 Set of 4 Nos Disc insulators) on pole comprising of cross arm, strains & clevis type disc insulator 16mm dia cotter pin strain type strain clamps 16mm dia 170mm long bolts with nuts, spring washers, split pin 5mm dia plain washers etc. The strain insulator set should be as per Sketch No. DY.CEE/Con/BG/GKP/STD/2/0592. (6 nos at each crossing)	Per No.	12	1,278.45	15,341.40
18	Supply of paint and painting(double coat paint & primer) (AS per IS: 5613) of existing/proposed pole structure upto full length as per drg. (4 nos at each crossing) enclosed.	Per No.	16	255.16	4,082.56
19	Supply & fixing of 11 KV& 33 KV Danger board 250x 300x 3mm thick G.I.sheet duly inscripted & painted & mounting/fixing on pole complete in all respect as per sketch attached .	Per No.	8	58.46	467.68
20	Re-sagging of adjacent 11/33KV over head mians (Spans) on pole fittings etc. complete in all respect.(2 nos at each crossing)	Per Span	8	209.00	1,672.00
21	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required and connection with 40mm x 4 mm GI strip/flat instead of GI wire.(4 nos for HT) crossing.	Per No.	16	2,654.86	42,477.76
22	Supply of barbed wire & making anti-climbing device on horizontal & diagonal MS angle iron bracings on pole etc. upto suitable height on pole for safety complete in all respect.	Per Kg.	40	59.37	2,374.80
23	Supply and drawing of Alumn. Conductor galvanised steel wire (DOG) on pole including its bending etc. complete in all respect. ACSR conductor will be supplied by contractor)(for 33KV OH line)	Per Mtr.	400	81.42	32,568.00
24	Supply and drawing of Alumn. Conductor galvanised steel wire (Rabbit) on pole including its bending etc. complete in all respect. ACSR conductor will be supplied by contractor) (for 11 KV OH line)	Per Mtr.	400	44.85	17,940.00
25	Supply,fixing & grouting of cable route marker on stone as per Attached Drg., No. DY.CEE/W/LJN/2011/01 complete in all respect. (4 nos at each crossing)	Per No.	8	341.59	2,732.72



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S. N.	Description of items	Unit	Approx Qty	Rates	Total Cost
26	Supply and erecting of stay set arrangement (Complete galvanised) 19/20 mm dia x 1.8M. long stay rod, anchor plate of size 45 cm x 45 cm x 7.5 mm thimble stay clamps, turn buckle 20 mm x 60 cm / 7/3.15 mm dia G.I stay wire and strain insulator etc. in cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 40 mm nominal size) foundation, including, excavation etc. complete in all respect. (HT) (8 nos at each crossing)	Per Set	32	2,081.20	66,598.40
27	Supply & fixing of alumn. Socket terminal for alumn. XLPE cable size 240/300 mm sq. 3 core cable complete in all respect.	Per No.	48	13.10	628.80
28	Dismantling of over head lines/ pole/ aluminum over head conductor, G.I. Wire, cross arm, Angle, insulators etc. complete in all respect and handing over to concerning SSE.	Per Kg.	250	67.19	16,797.50
29	Supply and erection of three piece nonlinear resistor type lighting arrestor suitable for 3 wire (3 nos in set), 11 KV overhead lines with rated voltage 9 KV (rms) with a nominal discharge current rating 5 KA and complete with galvanised clamping arrangement, GI bolts, nuts, washer etc as required. (2 nos at each crossing)	Per Set	4	5,282.28	21,129.12
30	Supply and erection of 33 KV Polymer Lighting Arrestor suitable for 3 wire (3 nos in set), 33 KV overhead lines with rated voltage 33 KV (rms) with a nominal discharge current rating 10 KA and complete with galvanised clamping arrangement, GI bolts, nuts, washer etc as required. (2 nos at each crossing)	Per Set	4	13,686.75	54,747.00
31	Cross linked polyethylene insulated 11 KV volt cable Aluminium conductor with extruded semiconducting compound screened and copper tape laid up with extruded inner sheath of plastic tape with filler at interstices, galvanized round wire/steel strip armoured and over all PVC sheathed cable confirming to Is : 7098/Pt.- II/2011 with latest amendment, size 3 core 240 sq. mm	Per Mtr.	320	1,214.62	3,88,678.40
32	Supply of 33 KV (E) grade (3 core 300 sq mm) HT cable stranded compacted circular aluminium conductor screen semi conducting compound XLPE insulated, insulation screening with extruded semi-conducting compound in combination of copper Tape, cores laid up inner sheath of PVC, galvanized steel flat string armoured and overall PVC sheathed cable confirming to Is : 7098/Pt.- II/2011 with latest amendment.	Per Mtr.	400	2,240.00	8,96,000.00
33	Preparation of final drawing in 02 sets and same to be got approved from UPPCL & Railway including collection of supervision charges. (for HT)	Each Crossing	4	4,487.16	17,948.64



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S. N.	Description of items	Unit	Approx Qty	Rates	Total Cost
Electrical related works (from Item 1 to item 33)		Total Cost in Rs. :			27,91,241.77
		Say Rs. :			27,91,242.00
B.	Civil Engineering				
1	Any item of DSR 2021	CPWD Delhi Schedule of Rate- 2021	Any item of DSR 2021	LS	-
2	Any item of USSOR 2021 of NER	USSOR 2021	Any item of USSOR 2021	LS	-
	Civil Engineering related works	Total Cost in Rs. :			-
C.	Electrical related works				
1	Any item of Electrical Works	L.S	L.S	L.S	50,00,000.00
	Electrical related works	Total Cost in Rs. :			50,00,000.00
Schedule G1B For Utility Shifting Works = (A+B+C)		Total Cost in Rs. :			77,91,241.77
		Say Rs. :			77,91,242.00
(Rupees Seventy Seven Lakh Ninty One Thousand Two Hundred Forty Two Only)					

Schedule G1C: For Unforeseen work

A.	Civil Engineering related works				
S.No	Description of items	CPWD/USSO R	Approx Qty.	Rates	Total Cost
1	Any item of DSR 2021	CPWD Delhi Schedule of Rate-2021	Any item of DSR 2021	LS	9,00,00,000.00
2	Any item of USSOR 2021 of NER	USSOR 2021	Any item of USSOR 2021	LS	9,00,00,000.00
	Schedule G1C for Unforeseen work			Total	18,00,00,000.00
(Rupees Eighteen Crores Only)					



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4. Schedule G1 (PVC)

Schedule	Description	Item	Value of Item/ Schedule	Payment Procedure	Applicable rates	PVC applicable
G1A	For Bridge Foundation, Substructure Works, FOB, Soil Stabilization, Dry Stone Pitching and JCB Hiring	NS items / latest version of both USSOR/ CPWD DSR		Payment shall be made on actual work done as per work done measured while submitting stage payment certificate.	As detailed in Para-3 above	YES
G1B	For Utility Shifting Work	NS items / latest version of both USSOR/ CPWD DSR		Payment shall be made on actual work done as per work done measured while submitting stage payment certificate.	As detailed in Para-3 above	NO
G1C	For Unforeseen Work	NS items / latest version of both USSOR/ CPWD DSR		Payment shall be made on actual work done as per work done measured while submitting stage payment certificate.	As detailed in Para-3 above	NO

Note: (1) Before start of any sub-work(s) under Schedule G-1, Drawing, Method Statement, BOQ shall be finalised and approved from Authority.



SCHEDULE - H
(See Clause 10.2.7)

DRAWINGS

1 Drawings

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

2 Additional Drawings

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



Annexure-I

(Schedule-H)

List of Drawings

List of Drawings and Documents to be furnished by the Contractor shall include, but not be limited to:

1. General & Civil Engineering:

- (a) General map of the country traversed by the Project, scale about 20 km to 1 cm;
- (b) Index map, scale about 1 km to 1 cm;
- (c) Index Plan and Sections prepared in accordance with the terms of Engineering Code;
- (d) Schematic Plans of Station Yards;
- (e) General arrangement drawings of Structures; and
- (f) River training/ Protection work.
- (g) Details of level Crossing and RUB/LHS and RFOs.
- (h) Station Yard Layout including details of connectivity with existing yards
- (i) Station Building including cabins, approach connectivity.
- (j) Details of Track Structure & its component.
- (k) Details of Integrated Maintenance Depots (IMD & ISMD) if any.
- (l) Details of existing utilities in Row and plan for their shifting.
- (m) Complete Plans.
- (n) Design Booklets of all components and structures duly proof checked.
- (o) Any other Drawings/Statements required by Railways for the commissioning of the project, relevant to the work undertaken by the Contractor.

These all drawings/ statements will be scrutinized by the authority and necessary corrections as desired to be attended by the Contractor. All final drawings/ statements are to be submitted in both hard and soft copy to the authority for final submission to CRS/NER Circle, Varansi.

2. Electrical Engineering (Traction):

- a. General arrangement of the SSP (Sub sectioning post) with the auto transformer. (These substations will be remotely controlled and operated).
- b. Power supply arrangement for (2 X 25 KV) AT system and Sectioning drawing for the traction arrangement.
- c. Power supply arrangement for the signals at the stations (Auxiliary transformer and the arrangement of 230-volt supply).
- d. Typical layout of the control room at the SSP.
- e. Typical layout of the remote-control centre.
- f. General arrangement of the implementation of the SCADA system.



- g. Earthing arrangement at the SSP.
- h. Typical arrangement of the regulated OHE for (2 X 25 KV) system with the feeder arrangement, in-principle LOPs, SEDs, CSDs and as-erected LOPs, SEDs, CSDs.
- i. Power supply arrangement with IR at interface point.
- j. All structural drawing of service/control building for SSP
- k. Detailed Structural layout drawing along with foundation of SSP.
- l. Small part steelwork fabrications- galvanised small part steelwork (SPS) assemblies required to support OHE, some of which may be special structural assemblies.
- m. Foundation layout of structures and Equipment including transformer
- n. General arrangement drawing and details of fencing panel and gate for SSP.
- o. Equipment Layout.
- p. Cable trenches.
- q. Cross section drawing,
- r. Drainage of SSP yard including that for cable trenches (control and containment of oil spills should be kept in view during design of the transformer bay.
- s. Drawing for Baffle wall and oil sump pit.
- t. Protection system scheme, proposed relay setting calculation.
- u. Earth resistivity measurement data.
- v. Earthing grid lay out including equipment earthing along with the calculation of safe touch and potential.
- w. Cross feeder connection to OHE from SSP.
- x. Structure Drawings and foundation drawing of Structures, Equipment like Masts, Gantries, Transformers, Auto transformers for 2x25 KV feeding system.
- y. Fencing layout, cable run lay out, trench lay out.
- z. Bus bar support.
- aa. Battery and battery charger details.
- bb. Earth screen wire

Note:

- The above drawing lists is not exhaustive any other drawing required will be supplied by Contractor.
- Structure Drawing for SSP shall be designed by Contractor (selected bidder) for approval of Railway.

3. Electrical Engineering (General Power supply):

- (a) General arrangement of the 11/33/66 KV substations for the station and the service buildings.
- (b) General arrangement of the distribution of the 415 V 50 Hz supply to various loads



4. Signal Engineering

(A) INDOOR & OUTDOOR DRAWINGS:

(i) Design & submission of three sets of paper copies-

S.N.	Description	Unit	Qty.
1	Design SWRD & submission of three copies for approval	Per station	1
2	Design of cable route plan (station section) & submission of three copies for approval	Per station	1
3	Design cable route plan (Block section) (if any as instructed by Railway Engineer) & submission of three copies for approval	Per station	1
4	Design of cable distribution plan / Cable Core Plan & submission of three copies for approval.	Per station	1
5	Design of Track Bonding plan & submission of three copies for approval	Per station	1
6	Design of Circuit Diagrams consisting as mentioned below & submission of three copies for approval (a)Wiring diagram along with all Logic details & interface circuit. (b)Relay Disposition chart (c) Contact analysis and fuse particulars. (d)Panel Termination Chart (e) CT rack Particulars (f) Input & Output bit chart	Per station	1
7	Design of Miscellaneous diagrams consisting as mentioned below & submission of three copies for approval (a) Floor plan for Relay room, Battery room, Power Eq. room, Data logger room. (b) Power supply diagram along with power supply calculation (c) Earthing diagram.	Per station	1
8	Design of Location Box Details (including contact analysis, Fuse particulars) and submission of three paper copies for approval	Per station	1
9	Design of Goomty/OC/End Cabin Details (including Relay disposition charge, Contact analysis, Fuse particulars, CT Rake particulars and floor plan) and submission of three paper copies for approval.	Per station	1



(ii) Supply of original tracings: -

S.N.	Description	Unit	Qty.
1	Supply of original tracing of SWRD after incorporating all the Corrections	Per station	1
2	Supply of original tracing of RCC/ST after incorporating all the Corrections	Per station	1
3	Supply of original tracing of PANEL Diagram/VDU after incorporating all the corrections	Per station	1
4	Supply of original tracing of cable route plan (station section) after incorporating all the corrections	Per station	1
5	Supply of original tracing cable route plan (Block section) (if any as instructed by Railway Engineer) after incorporating all the corrections	Per station	1
6	Supply of original tracing of cable distribution plan/ Cable Core Plan after incorporating all the corrections	Per station	1
7	Supply of original tracing of Track bonding plan after incorporating all the corrections	Per station	1
8	Supply of original tracing of circuit diagrams consisting of the items as mentioned below after incorporating all the corrections (a) Wiring diagram along with all Logic details & interface circuit (b) Relay disposition chart (c) Contact analysis and fuse particulars. (d) Panel Termination Chart (e) CT rack Particulars (f) Input & Output bit chart	Per station	1
9	Supply of original tracing of miscellaneous diagram consisting of the items as mentioned below after incorporating all the connections (a) Floor plan for Relay room, Battery room, Power Eq. room, Datalogger room. (b) Power supply diagram along with power supply calculation (c) Earthing diagram.	Per station	1
10	Supply of original tracing of location box Details (including contact analysis, Fuse particulars.) after incorporating all the corrections	Per station	1
11	Supply of original tracing of Goomty/End Cabins/OC Drawings (including relay Disposition chart, Contact Analysis and fuse particulars, CT rack particulars and floor plan) after incorporating all the corrections	Per station	1



(iii) Supply of Ammonia print/Paper Print: -

S.N.	Description	Unit	Qty.
1	Supply of Ammonia print/Paper Print of approval SWRD	Per station	3
2	Supply of Ammonia print/Paper Print of approved cable route plan (station section)	Per station	3
3	Supply of Ammonia print/Paper Print of approved cable route plan(Block section) (if any as instructed by Railway Engineer)	Per station	3
4	Supply of Ammonia print/Paper Print of approved cable distribution plan/ Cable Core Plan	Per station	3
5	Supply of Ammonia print/Paper Print of approved Track bonding plan	Per station	3
6	Supply of Ammonia print/Paper Print of approved circuit diagrams consisting of the items as mentioned below	Per station	3
	(a) Wiring diagram along with all Logic details & interface circuit		
	(b) Relay disposition chart		
	(c) Contact analysis and fuse particulars		
	(d) Panel Termination Chart		
	(e) CT rack Particulars		
7	(f) Input & Output bit chart	Per station	3
	Supply of Ammonia print/Paper Print of approved miscellaneous diagram consisting of the items as mentioned below		
	(a) Floor plan for Relay room, Battery room, Power Eq. room, Data logger room.		
	(b) Power supply diagram along with power supply calculation		
8	(c) Earthing diagram.	Per Station	3
	Supply of Ammonia print/Paper Print of approved location box Details (including contact analysis, Fuse particulars)		
9	Supply of Ammonia print/Paper Print of approved Goomty/OC/End Cabin Details (including relay Disposition chart, Contact analysis, fuse particulars, CT rack particulars and floor plan.	Per Station	3



(iv) Supply of completion diagram (6 sets.)

S.N.	Description	Unit	Qty.
1	Supply of six sets of Ammonia print/Paper Print of approved completion SIP	Per Station	1
2	Supply of six sets of Ammonia print/Paper Print of approved completion SWRD	Per Station	1
3	Supply of six sets of Ammonia print/Paper Print of approved completion RCC/ST	Per Station	1
4	Supply of six sets of Ammonia print/Paper Print of approved completion FPD/VDU/Panel Diagram	Per Station	1
5	Supply of six sets of Ammonia print/Paper Print of approved completion cable route plan (station section)	Per Station	1
6	Supply of six sets of Ammonia print/Paper Print of approved completion cable route plan (Block section) (if any as instructed by Railway Engineer)	Per Station	1
7	Supply of six sets of Ammonia print/Paper Print of approved completion cable distribution plan/ Cable Core Plan	Per Station	1
8	Supply of six sets of Ammonia print/Paper Print of approved completion Track bonding plan	Per Station	1
9	Supply of six sets of Ammonia print/Paper Print of approved completion circuit diagrams consisting of the items as mentioned below	Per Station	1
	(a)Wiring diagram along with all Logic details & interface circuit		
	(b) Relay disposition chart		
	(c) Contact analysis and fuse particulars.		
	(d) Panel Termination Chart		
	(e) CT rack Particulars		
	(f) Input & Output bit chart		
10	Supply of six sets of Ammonia print/Paper Print of approved completion miscellaneous diagram consisting of the items as mentioned below	Per Station	1
	(a) Floor plan for Relay room, Battery room, Power Eq. room, Data logger room.		
	(b) Power supply diagram along with power supply calculation		
	(c) Earthing diagram.		
11	Supply of six sets of Ammonia print/Paper Print of approved completion location box drawing (including contact analysis, Fuses particulars)	Per Station	1
12	Supply of six sets of Ammonia print/Paper Print of approved completion Goomty drawings (including relay Disposition chart, Contact Analysis, fuse particulars, CT rack particulars and floor plan)	Per Station	1
13	OEM and Pre Commissioning Check list	Per Station	1
14	Soft Copy (Auto CAD & Scan) in CD/Pen Drive (One No.)	Per Station	1



5. Telecommunication Engineering

- a. Location and connectivity of all equipment's and cables
 - b. Schematic and wiring diagrams
 - c. Cable core plan and numbering scheme
 - d. Equipment mounting details
 - e. Cable route drawings
 - f. Layouts in equipment racks, in equipment rooms, trackside, and all other equipment locations
 - g. Channeling plan.
- 6.** Tabulated details which shall consist of important characteristics of the railway or a portion of railway to be constructed, which shall, as may be applicable, include, but not be limited to the following:
- a. Curve Abstract;
 - b. Gradient abstract;
 - c. Bridge abstract;
 - d. Important bridges-particulars of waterway and construction;
 - e. Ballast and permanent way;
 - f. Station and station sites;
 - g. Station accommodation;
 - h. Station machinery;
 - i. Level crossing abstract;
 - j. Brief particular of tractions installations;
 - k. Power supply installation abstract;
 - l. Traction maintenance depot abstract;
 - m. Restricted overhead equipment clearance abstract; and
 - n. Electrical crossing over railway track abstract;



SCHEDULE - I
(See Clause 10.3.2)

PROJECT COMPLETION SCHEDULE

- A.** All provisions & para's (1 to 7) in this Schedule - I have been enclosed in square parenthesis and may be modified by the tendering authority, if necessary, as per specific project, before issuing the EPC Agreement forming part of Bid documents.
- B.** The cumulative damages against physical milestones as mentioned in clause 6 of this Schedule shall in any case remain limited to the overall limit of damages stipulated against Project milestone damages at each stage or overall.

1 Project Completion Schedule

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

- 1.1 The Project Completion Date shall be the 730th (Seven hundred and thirty) day from the Appointed Date.
- 1.2 On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.
- 1.3 Phase-completion shall be done from the end starting from Paniahwa.

2 Project Milestone-I

- 2.1 Project Milestone-I shall occur on the date falling on the 180th (one hundred and eighty) day from the Appointed Date (the “**Project Milestone-I**”).
- 2.2 Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Railway Project and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 15% (fifteen per cent) of the Contract Price.

Note: -

- i. 15% of the contract price shall not include advance payment made to the contractor as per the Article 17.2.
- ii. 15% of the contract price shall include the followings:
 - a) Completion of Principal site office and Labs.
 - b) Finalization of all drawings, ESPs/SIPs of Station Yards and Drawings listed in Annexure-II (Schedule-D).



- c) Design of formation (Earthwork & Blanketing) and all geotechnical investigations at Minor, Major and RUB bridge Site locations to be completed.
- d) All the Bridges masts drawings for OHE works should be completed.
- e) Minimum 3 Lakh cum earthwork shall be completed alongwith Minimum 3 km complete formation including blanketing.
- f) Minimum 3 Nos. Minor Bridges shall be completed in all respect.
- g) Minimum 1 No. Major Bridges shall be completed up to sub-structure.
- h) Minimum 4 Nos. RUB RCC box barrel portion shall be completed.
- i) Earthwork for SSP including control room should be completed alongwith boundary and foundation work for PSI equipment.

3 Project Milestone-II

- 3.1 Project Milestone-II shall occur on the date falling on the 390th (three hundred and ninety) day from the Appointed Date (the “**Project Milestone-II**”).
- 3.2 Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Railway Project and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 45% (Forty five per cent) of the Contract Price.

Note: -

- i. 45% of the contract price shall not include advance payment made to the contractor as per the Article 17.2.
- ii. 45% of the contract price shall include the followings:
 - a) Minimum 16 Lakh cum earthwork to be completed with Minimum 15 km formation complete including blanketing.
 - b) Minimum 9 Nos Minor Bridges shall be completed in all respect.
 - c) Minimum 7 Nos Major Bridges. to be completed upto sub-structure.
 - d) Minimum 14 Nos RUB RCC box barrel portion shall be completed.
 - e) All 3 station Buildings shall be completed including Electrical works and to be made ready for S&T works (relay room, battery room, IP room, Panel Room etc.).
 - f) Staff Quarters 9 Nos. shall be completed in all respect including water supply, colony road, drains and electrical connection/fittings.
 - g) All electrical equipment and other associated works of SSP should be completed in all respect.
 - h) Complete Wiring and adjustment work of OHE should be completed in all respect for Milestone-I.
 - i) Signal and telecom cable laying should be completed in all respect where earth formation and blanketing completed and FAT should be completed of all 3 stations.
 - j) Preparation of all documents related to Minor CRS sanction.



- k) OHE work including foundation and structure erection should be completed in all respect (except wiring) where earth formation and blanketing completed.
- l) AT supply including connection with OHE and installation of CLS panel including cable laying should be completed in all stations.

4 Project Milestone-III

- 4.1 Project Milestone-III shall occur on the date falling on the 630th (six hundred and thirty) day from the Appointed Date (the “**Project Milestone-III**”).
- 4.2 Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Railway Project and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 80% (eighty per cent) of the Contract Price.

Note: -

- i. 80% of the contract price shall not include advance payment made to the contractor as per the Article 17.2.
- ii. 80% of the contract price shall include the followings:
 - a) 100% formation and blanketing in entire stretch between Paniahwa to Madhubani (incl.) to be completed in all respect.
 - b) 100% Major Bridges, Minor Bridges & RUB/LHS to be completed in all respect.
 - c) 100% Circulating area including Approach Road, drains and platforms at all stations shall be completed.
 - d) All Track Laying and Linking, Signalling and telecom work including SAT should be completed in all respect.
 - e) OHE work including foundation and structure erection should be completed in all respect (except wiring) where earth formation and blanketing completed.
 - f) Complete wiring and adjustment work of OHE should be completed for Milestone-II.
 - g) SCADA work of SSP should be completed in all respect.
 - h) 100% OHE Work including SED, TWC and other ancillary work related to commissioning of OHE should be completed for Milestone-I & Milestone-II.
 - i) All the ancillary works including preparation of necessary CRS documents (minor sanction/opening documents) & applications required for Commissioning shall be completed.
 - j) Submission of TSAA

5 Scheduled Completion Date

- 5.1 The Scheduled Completion Date shall be the 730th (seven hundred thirty) day from the Appointed Date.



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

Note: -

- i. OHE work including wiring, adjustment, TWC, SED should be completed in the entire section in all respect.
- ii. Submission of as erected drawing of all OHE, PSI and General electrical works
- iii. Schedule Completion shall include Track Linking & Commissioning of entire section from Paniahwa to Madhubani including CRS inspection.
- iv. Preparation and submission of EIG papers for taking EIG sanction.
- v. Commissioning of all electrical assets of Milestone-I, II and III in all respect.
- vi. Commissioning of all signalling and telecom assets of Milestone-I, II and III in all respect.
- vii. Commissioning of all engineering assets of Milestone-I, II and III in all respect.
- viii. All Quarters shall be completed in all respect.
- ix. All Platforms & Station Buildings including circulating area, approach road, drains, PP Shed shall be completed in all respect
- x. All passenger amenities to be completed at all three stations.
- xi. All other balance activities including submission of completion drawings of all assets shall be completed in all respect before commissioning of section.

6 Physical Milestones

In addition to Project Milestones as stipulated above in financial terms i.e., % of contract price, the Contractor shall also be required to achieve Physical Milestones Stipulated as tabulated below.

Recovery of damages for not achieving physical milestone shall become due upon non completion of each dead line as mentioned in table below.

However, in case where subsequent physical milestone, logically sequenced for completion of item/project component is achieved and the delay is contained in opinion of the Authority, Authority may release the damage imposed earlier.



A. Project Initiation Stage

S.No.	Physical milestone no	Description of Physical Milestone	Deadline - Appointed Date (D)+Days	Damage per day after deadline
1	MI-1	Deployment of Contractor's Authorized Representative(project Director)	D+20	Rs. 10,000/day (subject to maximum of Rs. 3,00,00/month)
		Deployment of Design Director	D+20	Rs. 7500/day (subject to maximum of Rs. 2.25,000/month)
2	MI-2	Submission of Baseline Resource based project implementation Schedule on primavera(P-6 or latest version)	D+30	Rs 25,000/day
		DBR/DBN including design quality plan MTP,ITP etc.	D+30	Rs. 25,000/day
		Environmental management plan	D+30	Rs10,000/day
		Method statement key plan	D+30	Rs10,000/day per statement
		Monthly cash flow Forecast for the project	D+30	Rs15,000/day
		Resource Deployment plan (Men& Machinery)	D+30	Rs10,000/day
		Procurement plan in conformity with project implementation schedule(civil, Electrical,S&T)	D+30	Rs10,000/day
3	MI-3	Proposal to engage Design Consultant and GT agency with three alternatives of qualified, reputed and experienced Design firms	D+30	Rs25,000/day



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.No.	Physical milestone no	Description of Physical Milestone	Deadline - Appointed Date (D)+Days	Damage per day after deadline
4	MI-4	Proposal to engage Proof check consultant with three of qualified, reputed and experienced firms	D+30	Rs25,000/day

B. Project Planning Stage

S.No.	Physical milestone no	Description of Physical Milestone	Deadline - Appointed Date(D)+Days	Damage per day after deadline
1	MP-1	Setting up project office ,Site Laboratory	Project office - D+30, Laboratory-D+45	Rs.10,000/day
2	MP-2	Submission of utility Survey & Utility shifting plan	D+45 Days	Rs.15,000/day
3	MP-3	Submission of ground levels, cross section ,and validation report of tender data including alignment and L-section confirmation/modification	D+60 Days	Rs.15,000/day
4	MP-4	Submission of duly proof check drawings(including DBR/DBN)GADs for each type of bridge	D+75 Days	Rs.10,000/day
5	MP-5	Submission of Conceptual plan station and allied Buildings and Yard layout	D+75 Days	Rs.10,000/day
6	MP-6	Submission of GT, Hydrological & sub soil investigation Report should include Factual GT report, Interpretations and recommendation(incompliance to latest IS code)	D+75 Days	Rs.15,000/day
7	MP-7	Submission of detailed sample Design for each type of bridge	D+90 Days	Rs.10,000/day



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

S.No.	Physical milestone no	Description of Physical Milestone	Deadline - Appointed Date(D)+Days	Damage per day after deadline
8	MP-8	Submission of Route Control Charts & signaling interlocking plan	D+90 Days	0.01%(Zero-point Zero one percent)of the Contract Price for each day of delay after the deadline
9	MP-9	Submission of formation Design including slope protection	D+120 Days	10,000/day
10	MP-10	Submission of Procurement plan & delivery Schedule	D+120 Days	10,000/day
11	MP-11	Submission of duly proof check Detailed design for station building and allied building /structures	D+120 Days	10,000/day
12	MP-12	Submission of Schematic Drawings -signal Engineering	D+120 Days	10,000/day
13	MP-13	Submission of Schematic Drawings - Telecommunication Engineering	D+120 Days	10,000/day
14	MP-14	Submission of Schematic Drawings -Electrical (Traction)	D+120 Days	10,000/day
15	MP-15	Submission of Schematic Drawings -Electrical(General power supply)drawing	D+120 Days	10,000/day
16	MP-16	Submission of GT, Hydrological Investigation &Sub soil investigation report 100% Block Sections. Test Report should include factual GT report interpretation and recommendation (in compliance to latest IS Code)	D+120 Days	10,000/day
17	MP-17	Submission of formation Design including slope protection	D+120 Days	10,000/day



S.No.	Physical milestone no	Description of Physical Milestone	Deadline - Appointed Date(D)+Days	Damage per day after deadline
18	MP-18	Submission of duly proof checked detailed Design for all type of Bridges in one Block section	D+180 Days	10,000/day
19	MP-19	Submission of duly proof checked detailed Design for all type of Bridges and protection /miscellaneous work	D+270 Days	10,000/day

C. Project Construction Stage

S.No.	Physical milestone no	Description of Physical Milestone	Deadline - Appointed Date(D)+Days	Damage per day after deadline
1	MCn-1	Making arrangement of water, power at site	FMI-1(1/2)	Rs. 5,000/day
2	MCn-2	Mobilization and erection of plants and equipment	FMI-1(1/2)	Rs. 5,000/day
3	MCn-3	Complete Utility Shifting	FMI-1	Rs. 5,000/day
4	MCn-4	Site Clearance and preparation of formation ,including all the Functional station & yard(if any) of 50% of the project length	FMI-1	Rs. 5,000/day
5	MCn-5	Foundation of bridges (Important major/ROB/RUB, Minor bridge	FMI-1+1/2 of (FMI-2 - FMI-1)	Rs. 5,000/day
6	MCn-6	Station & Allied Buildings- Foundation	FMI-1+1/2 of (FMI-2 - FMI-1)	Rs. 5,000/day
7	MCn-7	Sub-Structure of bridge - 100%of each bridge	FMI-2	Rs. 5,000/day
8	MCn-8	S&T cable trenching 100%of project length	FMI-2	Rs. 5,000/day
9	MCn-9	Procurement (p-Way ,OHE and S&T in conformity to delivery schedule, an allowance of 15 days shall be made for transportation uncertainties	FMI-2	Rs. 5,000/day



S.No.	Physical milestone no	Description of Physical Milestone	Deadline - Appointed Date(D)+Days	Damage per day after deadline
10	MCn-10	Site Clearance and preparation of formation ,including all the Functional station & yard(if any) 100%	FMI-2+1/2 of (FMI-3 - FMI-2)	Rs. 5,000/day
11	MCn-11	Ballast spreading - 50% of total Block section	FMI-2+1/2 of (FMI-3 - FMI-2)	Rs. 5,000/day
12	MCn-12	Station & Allied Buildings- Foundation	FMI-2+1/2 of (FMI-3 - FMI-2)	Rs. 5,000/day
13	MCn-13	foundation of OHE mast & cable laying	FMI-2+1/2 of (FMI-3 - FMI-2)	Rs. 5,000/day
14	MCn-14	Ballast spreading & Sleeper laying 100%	FMI-2+1/2 of (FMI-3 - FMI-2)	Rs. 5,000/day
15	MCn-15	Station & Allied Buildings- Foundation	FMI-2+1/2 of (FMI-3 - FMI-2)	Rs. 5,000/day
16	MCn-16	Bridge placement of bearing and Girder launching/Deck Slab Casting -100%	FMI-2+1/2 of (FMI-3 - FMI-2)	Rs. 5,000/day
17	MCn-17	Station & Allied Buildings External services & connectivity	FMI-2(1/2)	Rs. 5,000/day
18	MCn-18	Mast Erection & Bracket Fixing	FMI-3	Rs. 5,000/day
19	MCn-19	station & Allied Building – System & equipment's	FMI-3	Rs. 5,000/day
20	MCn-20	Track Linking	FMI-3	Rs. 5,000/day
21	MCn-21	OHE Wire Fixing & cable Laying -100%	FMI-2+1/2 of (FMI-4 - FMI-3)	Rs. 5,000/day
22	MCn-22	Testing & Commissioning	FMI-4	Rs. 5,000/day
23	MCn-23	CRS Inspection	FMI-4	Rs. 5,000/day
24	MCn-24	Demobilization & Site Clearance	FMI-4+30days	Rs. 5,000/day

7 Extension of time

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Completion Date, as the case may be, under and in accordance



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

with the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly.]



SCHEDULE - J

(See Clause 12.1.2)

Tests on Completion

1 Schedule for Tests

- 1.1 The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority Engineer and the Authority of its intent to subject the Railway Project to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.
- 1.2 The Contractor shall notify the Authority Engineer of its readiness to subject the Railway Project to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-J.

2 Tests

- 2.1 Visual and physical test: The Authority Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include all tests which are on component materials/finished samples in accordance with various codal provisions for all the works under this scope of agreement.
- 2.2 Integrated Testing of system followed by a period of trial running. The test sequence may be as shown below:-
 - a) Tests on Equipment
 - b) Installation Test and sub-system individually
 - c) System Integrated Test
 - d) Final Acceptance Test
 - e) Trial Running
- 2.3 Sanction of Commissioner of Railway Safety (CRS) is required before opening of track in terms of Chapter XIII of Indian Railway Permanent Way Manual.
- 2.4 [Riding quality of track and recording of various track parameters on electronic track recording car will be arranged and run by the Authority. This run will be scheduled after the floating parameters recorded are found to be within acceptable limits. The TGI value of this trial run shall be more than (specify value)].



- 2.5 Tests for bridges: All major and minor bridges shall be subjected to the tests as prescribed in Specifications and Standards in Schedule D.
- 2.6 Other tests: The Authority Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Railway Project with Specifications and Standards.
- 2.7 Environmental audit: The Authority Engineer shall carry out a check to determine conformity of the Railway Project with the environmental requirements set forth in Applicable Laws and Applicable Permits.
- 2.8 Safety Audit: The Authority Engineer shall carry out, or cause to be carried out, a safety audit to determine conformity of the Railway Project with the safety requirements and Good Industry Practice.

3 Agency for conducting Tests

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

4 Completion Certificate

Upon successful completion of Tests, the Authority Engineer shall issue the Provisional Certificate in accordance with the provisions of Article 12. For the avoidance of doubt, the Completion Certificate shall not be issued by the Authority Engineer unless authorisation of the Commissioner for Railway Safety has been obtained.



SCHEDULE - K
(See Clause 12.2 and 12.4)

1. PROVISIONAL CERTIFICATE

- 1 I/We, (Name of the Authority Engineer), acting as the Authority Engineer, under and in accordance with the Agreement dated (the “**Agreement**”), for construction of the section (kmto km ...) in the State ofin-..... Railway (the “**Railway Project**”) on Engineering, Procurement and Construction(EPC) basis through (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Railway Project with the provisions of the Agreement.
- 2 Certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Railway Project or affect their safety or the movement of rail traffic in any manner. These works have been specified in the Punch List appended hereto, and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement.
- 3 In view of the foregoing, I/We am/are satisfied that the Railway Project from km to km can be safely and reliably placed in service of the Authority for railway freight and passenger traffic, subject to authorisation by the Commissioner of Railway Safety in accordance with Applicable Laws. In terms of the Agreement, the Railway Project is hereby provisionally declared fit for entry into operation on this the day of 20.....

ACCEPTED, SIGNED, SEALED
AND DELIVERED
For and on behalf of
CONTRACTOR by:
by:

SIGNED, SEALED AND
DELIVERED
For and on behalf of
AUTHORITY ENGINEER

(Signature)

(Signature)



2. COMPLETION CERTIFICATE

- 1 I/We, (Name of the Authority Engineer), acting as the Authority Engineer, under and in accordance with the Agreement dated (the “**Agreement**”), for construction of thesection (km to km) ofin the State of in-..... Railway (the “**Railway Project**”) on Engineering, Procurement and Construction (EPC) basis through (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Railway Project with the provisions of the Agreement, and the authorisation by the Commissioner for Railway Safety under Applicable Laws has been obtained.
- 2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Railway Project have been completed, and the Railway Project is hereby declared fit for entry into operation on this the day of 20.....

SIGNED, SEALED AND DELIVERED

For and on behalf of

the Authority Engineer by:

(Signature)

(Name)

(Designation)

(Address)



SCHEDULE - L
(See Clause 16.1.1)

SELECTION OF AUTHORITY ENGINEER

1 Selection of Authority Engineer

- 1.1 Authority shall appoint a railway engineer/ Project Management Services (PMS) Agency, to be the engineer as set forth in Article 16, to be the engineer under this Agreement (the “Authority Engineer”).

Generally, a railway officer of Selection Grade (SG)/Junior Administrative Grade (JAG)/Project Management Services (PMS) Agency shall be appointed as Authority Engineer. Authority shall notify the Contractor in writing of the appointment and identity of the Authority Engineer and of any replacement thereof from time to time.

2 Terms of Reference

The Terms of Reference for the Authority Engineer (the “TOR”) shall substantially conform with Annex 1 to this Schedule L.



Annex – I
(Schedule - L)

DUTIES & RESPONSIBILITIES FOR AUTHORITY ENGINEER

1 Scope

- 1.1 These Duties & Responsibilities (DR) shall apply to construction and maintenance (wherever applicable) of the Railway Project.

2 Definitions and interpretation

- 2.1 The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.
- 2.2 References to Articles, Clauses and Schedules in this DR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this DR.
- 2.3 The rules of interpretation contained in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, *mutatis mutandis*, to this DR.

3. General

- 3.1 The Authority Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.
- 3.2 The Authority Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority (where Authority Engineer is designated as the Authority, the compliance of these conditions have to be ensured by him/her) before determining:
- (a) any Time Extension;
 - (b) any additional cost to be paid by the Authority to the Contractor;
 - (c) the Termination Payment;
 - (d) providing Power Block or Traffic Block to the Contractor;
 - (e) approval of signalling plan and signalling plan and route control chart;
 - (f) approval of disconnections for modification of signalling and telecom works;



- (g) any other matter which is not specified in (a) to (f) above and which creates an obligation or liability on either Party for a sum exceeding Rs.5,000,000/- (Rupees fifty lakh).
- 3.3 The Authority Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions assigned to him for the project. Such reports shall be submitted by the Authority Engineer within 10 (ten) days of the beginning of every month.
- 3.4 The Authority Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.
- 3.5 In the event of any disagreement regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on Good Industry Practice and authentic literature.
- 3.6 The Authority Engineer shall verify the as built drawings submitted by the Contractor after completion of the works. These drawings will be signed by the Authority Engineer after due verification.
- 4. Construction Period**
- 4.1 During the Construction Period, the Authority Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites and topographical surveys. The Authority Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of an Important Bridge, a Major Bridge or Structure, and interlocking and telecom switching equipment the aforesaid period of 15 (fifteen) days may be extended up to 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.
- 4.2 The Authority Engineer shall review any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.
- 4.3 The Authority Engineer shall review the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty-one) days stating the modifications, if any, required thereto.
- 4.4 The Authority Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor. The



Authority Engineer shall draw the non-interlocking programme for works involving existing yards and issue a jointly agreed NI programme for each such yard.

- 4.5 The Authority Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Railway Project for purposes of maintenance during the Construction Period in.
- 4.6 The Authority Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.
- 4.7 The Authority Engineer shall inspect the Construction Works and the Railway Project and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies.
- 4.8 The Authority Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority Engineer may require.
- 4.9 For determining that the Works conform to Specifications and Standards, the Authority Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4.9, the tests specified in ***** Manuals or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.
- 4.10 The Authority Engineer shall test check prescribed in this agreement for each category or type of test for quality control by the Contractor.
- 4.11 The timing of tests referred to in Paragraph 4.9, and the criteria for acceptance/ rejection of their results shall be determined by the Authority Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.
- 4.12 In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority Engineer shall require the Contractor to carry out remedial measures.
- 4.13 The Authority Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Railway Project, 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 19.6 shall apply.



- 4.14 In the event that the Contractor fails to achieve any of the Project Milestones, the Authority Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority Engineer shall determine that completion of the Railway Project is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.
- 4.15 The Authority Engineer shall obtain from the Contractor a copy of all the Contractor’s quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.
- 4.16 Authority Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the public and pedestrians. After the Contractor has carried out remedial measure, the Authority Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.
- 4.17 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and the public, and requires the Authority Engineer to inspect such works, the Authority Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.
- 4.18 The Authority Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-J and issue a Completion Certificate or Provisional Certificate, as the case may be. For carrying out its functions under this Paragraph 4.18 and all matters incidental thereto, the Authority Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-J.

5. Determination of costs and time

- 5.1 The Authority Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.
- 5.2 The Authority Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.
- 5.3 The Authority Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 16.5.



6. Payments

- 6.1 The Authority Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority Engineer in accordance with the provisions of Clause 10.2.7 (d).
- 6.2 Authority Engineer shall -
- (a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 17.4, determine the amount due to the Contractor and recommend the release of 80 (eighty) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and
 - (b) within 20 (twenty) days of the receipt of the Stage Payment Statement referred to in Clause 17.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor.

7. Other duties and functions

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

8. Miscellaneous

- 8.1 A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority Engineer thereon, shall be furnished by the Authority Engineer to the Authority forthwith.
- 8.2 The Authority Engineer shall retain at least one copy each of all Drawings and Documents received by it, including ‘as-built’ Drawings, and keep them in its safe custody.
- 8.3 Within 90 (ninety) days of the Project Completion Date, the Authority Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Railway Project as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Railway Project and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.
- 8.4 The Authority Engineer shall inform the Authority and the Contractor of any event of Contractor’s Default within one week of its occurrence.



SCHEDULE - M

(See Clauses 17.4.1, 17.6.1, and 17.6.1)

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

- (a) the estimated amount for the Works executed in accordance with Clause 17.3.1 subsequent to the last claim;
- (b) amounts reflecting adjustments in price for the aforesaid claim;
- (c) the estimated amount of each Change of Scope Order executed subsequent to the last claim;
- (d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.3 (a);
- (e) total of (a), (b), (c) and (d) above;
- (f) Deductions:
 - (i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
 - (ii) Any amount payable by the Contractor to the Authority under the provisions of the Agreement; and
 - (iii) Any amount towards deduction of taxes at source under Applicable Laws.
 - (iv) Total of (i) to (iii) above.
- (g) Net claim: (e) – (f) (iv);
- (h) The amounts received by the Contractor up to the last claim:
 - (i) For the Works executed (excluding Change of Scope orders);
 - (ii) For Change of Scope Orders, and
 - (iii) Taxes deducted at source under Applicable Laws

2. Contractor's claim for Damages

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



SCHEDULE - N

(See Clause 18.1)

INSURANCE

1. Insurance during Construction Period

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

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

- 3.1 The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule) or to any person (except persons insured under Clause 18.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount specified below with no limit on the number of occurrences.

The insurance cover shall be not less than: Rs. **4.60 Cr.**



- 3.2 The insurance shall be extended to cover liability for all loss and damage to the Authority’s property arising out of the Contractor’s performance of this Agreement excluding:
- (a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and
 - (b) damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

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



SCHEDULE - O

(See Clauses 4.6 & 4.7)

Provision of Traffic Blocks and Power Blocks

1. Provision of Traffic Blocks Power Blocks and Disconnections

- 1.1 The authority shall provide Power Blocks or Traffic Blocks or Power Blocks, or both, during day or night, as the case may be, to enable the Contractor to execute the construction works of overhead equipment, or such other work as may be determined by the Authority Engineer. The maximum aggregate duration of blocks for the Railway Project shall be 3 (three) hours.
- 1.2 The Contractor is entitled to execute the construction work within the block period specified in this Schedule-O. The total duration of Power Block or Traffic Block or both, as the case may be, shall not exceed 20% of the period specified in this Agreement. In case such total duration exceeds 20% the Contractor shall pay Damages at the rate of Rs.10,000/- per hour or part thereof for the exceeded Block periods.
- 1.3 The Authority shall arrange for disconnections of S&T system as determined by Authority Engineer, to enable the Contractor to execute the construction work which affects existing Signalling and Telecommunication installations.

—



SCHEDULE - P

(See Clauses 4.4)

Machinery and equipment

- The Authority shall provide the following machinery and equipment to the Contractor at the daily rates shown against each machinery and equipment:

For Track Machines: -

S.N.	Particulars of each type of machinery and equipment	Unit rate in rupees in rounded figures.
1	DTE	1,07,357/- per km
2	CSM	1,04,595/- per km
3	DUO	89,543/- per km
4	DGS	99,316/- per km
5	UNIMAT	1,17,797/- per T/out
6	T-28	5,09,756/- per Km

Note: These rates are prevailing rates as per CE/TMC's letter no. W/275/34/TMC/UNI-Co/2024-25/4A dated 20.08.2025. These rates are indicative and rates applicable at time of use of these track machines will be levied. These rates are exclusive of fuel charges. Fuel charges as per actual consumption shall be borne by the Contractor. If idling is on account of contractual agency the amount is to be deducted as per advice of CE(TMC)/NER.

For Electrical Machinery & Equipment: -

S.N.	Particulars of each type of machinery and equipment	Daily rate in rupees in rounded figures.
1	Tower Wagon 8W	6000/- each/day
2	Wagons for wiring deck and mast erection	1000/- each/day
3	Diesel Loco	2000/- each/day
4	BRN Wagon	1000/- each/day

Note: For Machines and T&P whose hire charges on not mentioned above, the monthly rate for those machines/ equipment shall be equal to 2% (two per cent) of the cost of such machine or equipment, as published in the latest Pink Book of Ministry of Railways. If the cost of any machine or equipment has not been published in the latest Pink Book, then the last purchase price thereof, shall be applicable for determining the charges for such machine or equipment.

It would be clearly understood that it is entirely the Contractor's responsibility and liability to procure all the machinery, tools and plants, and their spare parts that are required for the efficient and methodical execution of the work. Delay in procurement of such items due to their non-availability



or its import difficulties of any other causes whatsoever, will not be taken as an excuse for slow or non-performance of work.

The Railway may, depending on availability, give on hire to the Contractor any plant as considered necessary by the Engineer. However, it does not guarantee hiring any machinery and it shall not entertain any claim or compensation due to Railways inability to supply any plant / machinery or the condition of the railway's plant / machinery supplied on hire shall not be taken as an excuse for slow progress or for non- performance of the work.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

The End of Schedules.



EPC tender for “Civil Engineering Works, Electrification Works and Signalling & Telecommunication Works of New Single Broad Gauge line of Paniahwa (Excl.) (Chainage 0+350) - Madhubani (Incl.) (Chainage 29+400) Section (Length: 29.050 Km) in connection with Paniahwa – Chhitauni – Tamkuhi Road New Broad Gauge Railway Line Project of North Eastern Railway”.

Appendices



APPENDIX-I

LIST OF BID-SPECIFIC CLAUSES[§]

A. Clauses with non-numerical (\$) footnotes:

1. Clause 3.2.1 : Obligation relating to sub-contracts and any other agreements
2. Clause 13.5.1 : Power of the Authority to undertake works
3. Article 26 : Definition of Consortium/Joint Venture
4. Schedule-F, Annexure-I : Item (C)-8
5. Schedule-F, Annexure-III : Item (B) and Item (C)-8

B. Clauses with curly { } brackets:

1. Recital : Para 2
2. Clause 1.5 : Joint and several liability
3. Clause 3.2.1 : Obligations relating sub-contracts and any other agreements
4. Clause 5.1 (l) : Representations and warranties of the Contractor
5. Article 26 : Definition of “Affiliate”, “Consortium/Joint Venture” and “Lead Member”
6. Contract Agreement : ‘Signature’ page
7. Schedule-F, Annexure-I : Item (B) and Item (C) 1
8. Schedule-F, Annexure-III : Item (B)

[§] This Appendix-I contains a list of clauses that would need to be suitably modified for reflecting bid-specific provisions after the contractor has been selected. This Appendix-I may be included in the draft EPC Agreement forming part of the bid documents. It may, however, be deleted when the Contract Agreement is to be executed.



C. Clauses with Blank Spaces (.....), (*)**

1. First line of the Concession Agreement
2. Recital : Para 2
3. Recital : Item A, B, C and D
4. Clause 3.9 : Training of Authority’s Personnel
5. Clause 17.1.1 : Contract Price
6. Schedule-F, Annexure-I : Item A, B and C
7. Schedule-F, Annexure-I : Signing Date
8. Schedule-F, Annexure-II : Item A and C
9. Schedule-F, Annexure-II : Signing Date
10. Schedule-F, Annexure-III : Item A, B and C
11. Schedule-F, Annexure-III : Signing Date
12. Schedule-L, Annexure-I : Clause 1.1 : Scope



APPENDIX-II

LIST OF PROJECT SPECIFIC CLAUSES²⁴

A. Clauses with serially numbered footnotes

1. First line of Contract Agreement (footnote no.1)
2. Recital : Para 2 (footnote no.2 & 3)
3. Recital : Para 2 : Item A (footnote 4 & 5)
4. Clause 3.9.2 : Training of Authority’s Personnel (footnote no.6)
5. Clause 4.1.3(b) and (c) : Obligation of the Authority (footnote no. 7 & 8)
6. Clause 4.3 : Environmental and forest clearances (footnote no.9)
7. Clause 4.4.3 : Machinery and equipment (footnote no.10)
8. Clause 4.5 : Electricity transmission lines (footnote no.11)
9. Clause 7.1.1 : Performance Security (footnote no.12)
10. Clause 7.5 : Retention Money (footnote no.13)
11. Clause 17.2.1 : Advance Payment (footnote no.14)
12. Clause 17.8.4 : Price adjustment for the works (footnote no.15)
13. Schedule-A, Annexure-I : Site (footnote no.16)
14. Schedule-B, Annexure-I : Description of Railway Project (footnote no.17)
15. Schedule-C : Project facilities (footnote no.18)
16. Schedule-D, Annexure-I : Specifications and standards for construction (footnote no.19)

²⁴This Appendix-II contains a list of clauses that would need to be suitably modified prior to issue of bid documents for reflecting project specific provisions. This Appendix-II should be omitted before issuing the draft Concession Agreement, forming part of the bid documents



B. Clauses with square [] parenthesis:

1. Recital : Para 1
2. Recital (B)
3. Clause 3.2.1 : Obligations relating to sub-contracts and any other agreements
4. Clause 3.4.1 : Contractor’s Personnel
5. Clause 3.9 : Training of Authority’s Personnel
6. Clause 4.1.3(c) : Obligations of the Authority
7. Clause 4.1.4 : Obligations of the Authority
8. Clause 4.4.1(c) : Machinery and equipment
9. Clause 4.5 : Electricity transmission lines
10. Clause 4.7 : Provision of power blocks and traffic blocks
11. Clause 8.1(a) : The Site
12. Clause 10.3.1 : Construction of Railway Project
13. Clause 10.4.1(a) : Extension of time for completion
14. Clause 12.2.1 : Provisional certificate
15. Clause 15.1.2 : Defects liability period
16. Clause 17.8.4 : Price adjustment for the works (formulae for price adjustment)
17. Clause 18.1.6 : Insurance for works
18. Clause 20.1 : Governing Law and Jurisdiction
19. Clause 25.13(a) and (b) : Notices
20. Article 26 : Definitions
 - “GAD” or “General Arrangement Drawings”
 - “Project Assets”
21. Signature of the Authority on the last page of the Agreement
22. Schedule-A, Annexure-I : Site
23. Schedule-A, Annexure-II : Date for providing Right of Way



24. Schedule-A, Annexure-III : Alignment Plans
25. Schedule-B, Annexure-I : Description of Railway Project
26. Schedule-C : Project Facilities
27. Schedule-D, Annexure-I : Specifications and Standards for Construction
28. Schedule-F, Annexure-I : Form of Bank Guarantee for Performance Security
29. Schedule-F, Annexure-IA : Form of Insurance Surety Bond for Performance Security
30. Schedule-F, Annexure-II : Form of Guarantee for Withdrawal of Retention Money
31. Schedule-F, Annexure-III : Form of Guarantee for Advance Payment
32. Schedule-G : Contract Price Weightages
33. Schedule-I : Project Completion Schedule
34. Schedule-J : Tests on Completion
35. Schedule-N : Insurance
36. Schedule-O : Provision of traffic blocks and power blocks