



## **Engineering, Procurement and Construction (EPC) Agreement with Schedule G-1 for Railway Projects**

“Construction of New Railway BG line in Km 28/970 to 42/040 in between Kulthana including and Rajpura stations including Earthwork, Minor bridges (03 Nos) and Major bridges (07 Nos), station buildings, Tunnels (7 Nos) and MEGA Bridge (03 Nos) in connection with Ratlam Mhow Khandwa Gauge Conversion in the State of Madhya Pradesh”

Engineering, Procurement & Construction  
(EPC) Mode

**CONSTRUCTION DEPARTMENT**

**WESTERN RAILWAY, CHURCHGATE MUMBAI**

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**Tunnel Specifications and Preliminary Reports: Vol II of Tender document**



## **P R E A M B L E**

### **Need for EPC contracts:**

Railways had hitherto been undertaking construction projects through the conventional item rate contracts where the Authority provides the detailed design as well as the estimates of quantities for different items of work (Bill of Quantities). Payments to the contractor are made on the basis of measurements of the work done in respect of each item. Experience in railway projects shows that item rate contracts are prone to excessive time and cost overruns due to delays in design and drawing, variation in items and quantities and inadequate fund provisions as allocation of construction risks are largely to the Authority. Considerable time of Project Engineers is consumed in dealing with variations in quantities, introduction of Non-Schedule Items and variation in contract price.

The growing requirements of the economy will necessitate faster expansion of the freight network through new capacity creation. Considering that improved and modernised project execution capabilities would be critical for speedy capacity creation, it has been decided to adopt the Engineering, Procurement and Construction (EPC) mode of contracting for construction of railway projects.

On Indian Railways, EPC model has been used earlier in a limited way for constructing some bridges on Jammu-Udhampur rail link. However, in railway sector, EPC model has been extensively and successfully used by Delhi Metro Rail Corporation (DMRC) over the years. Accordingly, the processes for design approval, supervision and monitoring etc have been suitably incorporated in the Model EPC Agreement as per the practices being followed in DMRC.

Based on the Railways' experiences (above 5 years), a 10 member SAG review committee (convener HAG) was constituted by Railway Board to evaluate relevant provisions. Following a detailed assessments, deliberations of committee's findings and consultation with all stakeholders, revised provisions were proposed and accepted.

In order to address uncertainties in the EPC tendering mode, schedule G-1 (separate Bill of Quantities for itemized work) has been introduced. Inclusion of Schedule G-1 is optional/discretionary and contingent upon the project specific needs of the respective Zonal Railways. However, in case G1 is to be made operational, eligibility criteria of such EPC tender shall be evaluated on the basis of total Tender value which also includes the value of Schedule G-1.

### **Model EPC Agreement:**

The aforesaid drawbacks of item rate contracting can be addressed by adopting the EPC approach that relies on assigning the responsibility for investigations, design and construction to the contractor for a lump sum price determined through competitive bidding. The objective is to ensure speedy implementation of the project to the specified standards and effective designs, and least time overrun while assigning & balancing various risks judiciously between contractor and authority.

This Standard EPC Agreement provides a contractual framework that balances the allocation of risks and rewards, provides equity of obligations and penalties between Authority and the Contractor, minimises the ambiguities and uncertainties, thus improves the predictability of cost & time. It also follows the global best practices related to force majeure, termination and dispute resolution, apart from transparent and fair procedures. The Contractor also has full freedom to plan the construction

schedule for efficient use of its manpower, equipment and other resource while payments are linked to specified stages of construction (payment milestones) vis-à-vis the payment for individual items/units under the item rate contract. Awarding contract for a lump sum price ensures value engineering, balancing of risks and financial discipline, both for the contractor and the Authority. The contract price is subject to adjustment on account of price variation during the contract period as per specified formula

### **Technical parameters:**

The Standard EPC Agreement specifies the required design standards and allows the Contractor to design and construct the project using design engineering and global best practices to achieve quality, speed, efficiency and economy as compared to the item rate contract that relies on a fixed design provided by the Authority.

Only the core requirements of design and construction of the railway project that have a bearing on the quality and safety of assets are to be specified and enough room would be left for the contractor to add value. This would provide the requisite flexibility to the contractor in evolving and adopting the efficient designs without compromising on the quality and safety.

### **Contract period:**

The contract period is determined on a project-specific basis depending on the volume of construction work involved. The Contractor shall be liable to pay Damages at the specified rate for each day of delay beyond the specified date of completion, subject to the total amount of Damages not exceeding 10 per cent of the Contract Price. However, the Contractor shall be entitled to time extension arising out of delays on account of change of scope and force majeure or delays caused by or attributable to the Authority.

### **Selection of contractor:**

Selection of the contractor will be based on open competitive bidding. All project parameters such as the contract period, price adjustments and technical parameters are to be clearly stated upfront along with lump sum price for the Railway Project.

### **Risk allocation:**

Projects risks such as soil conditions and weather or commercial and technical risks relating to design and construction have been assigned to the Contractor. The Authority accepts its liability to pay damages to the Contractor for any delays in handing over the land, approvals from road authorities for road over-bridges/under-bridges at level crossings, environment clearances, shifting of utilities and approvals in respect of engineering scale plan and signalling interlocking plan.

### **Design and Construction:**

It defines the scope of the railway project with precision and predictability to enable the Contractor to determine its costs and obligations. It also lays down a ceiling of 25 per cent of contract price to cater for any changes in the scope of project, the cost of which the Authority will bear.

The Contractor shall carry out survey and investigations and also develop designs and drawings in conformity with the specifications and standards laid down in the Agreement. Authority's engineer shall review the design and drawings to ensure that these conform to the scope of the project, design standards and specifications. The EPC agreement also stipulates provisions for quality control and quality assurance.

### **Monitoring and Supervision:**

Monitoring and supervision of construction are proposed to be undertaken through an engineer to be designated as 'Authority's Engineer', who would be assisted by requisite organizational support for day-to-day interaction between the Authority and the Contractor. Typical organizational structure proposed to be followed for Authority's Engineer shall be in line with the organizational set up being followed by DMRC for monitoring and supervision of their EPC contracts. The Authority's Engineer will act as a single window for coordination with the contractor.

The Agreement provides for the schedule indicating the timeline within which Authority will ensure the clearances of design proposals submitted by the contractor. Any comment by the Authority on the design proposals submitted by the contractor will be communicated in totality once in a time-bound manner as indicated in the schedule. The contractor will be free to proceed with construction after the expiry of specified period in case no remarks/clearances are given by the Authority.

### **Milestone based payments:**

A simple and rational method for estimating interim payments to the Contractor has been provided in the Agreement. It ensures that payments are made for works conforming to the Agreement and commensurate with the stages of completion of works. Works have been broadly divided into three categories, namely, civil and track works, signalling and telecommunication works and electrification works, which could be taken together under a single project or separately under different projects. Each item of work has been further subdivided into stages and payment will be made for each completed stage of work.

A provision has been made for damages which the Contractor shall pay to Authority for not achieving the prescribed milestones. Authority will pay bonus to the Contractor for completion of the project before the scheduled completion date.

### **Defects liability period:**

Though normally a defects liability period of one year is specified in most contracts, a defects liability period of two years has been specified in the Agreement in order to provide additional comfort to the Authority.

### **Termination dispute resolution:**

In the event the Authority terminates the Agreement on account of any of the specified defaults of the Contractor, the Agreement allows the Authority to forfeit the performance security & retention money of the Contractor. Similarly, defaults by the Authority are proposed to qualify for adequate compensatory payments to the contractor. The Agreement also addresses issues relating to dispute resolution and provides a mechanism for the same

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Part I  
**Preliminary**

**ENGINEERING, PROCUREMENT AND CONSTRUCTION  
AGREEMENT**

THIS AGREEMENT<sup>1</sup> is entered into on this the ..... day of ....., 20.....

**BETWEEN**

- 1 [The President of India, represented by Chief Engineer (Con)/IV/CCG [Mumbai], and having its principal offices at Churchgate Mumbai, [400020] (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 {.....}<sup>2</sup> means the selected bidder having its registered office at ....., (hereinafter referred to as the “**Contractor**” whose 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 West Central Railway zone.
- (B) The Authority had resolved to [undertake the construction of new railway line between \*\*\*\* and \*\*\*\* in the West Central 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.
- (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

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<sup>1</sup> 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.

<sup>2</sup>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.

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

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

<sup>5</sup>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.

“**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}}

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 BLT with all fittings, PSC sleepers, Turnout sleepers, Special sleepers (SEJ/Guard Rails, Points and crossing etc) with all matching fastening components, Points and crossings with all fittings complete, supply of machine crushed stone ballast, H beams sleepers with all its fittings over Open web Girder, SEJs, Check rails, fish plates, welding with consumables (Flash butt and AT welding). Civil works for electrification (OHE foundation, BEC, OHE Fixtures in tunnels with all material), cable duct for Signalling and Telecommunication in the entire block section as per laid down specifications along with OHE work as defined in Sch B**
- (b) **New 260 m. long rails and Single Rails (13m/26m) for Main / loop lines/P&C shall be provided by the Authority free of cost. 260 m/26 m Long rails will be transported by EUR to site which shall be unloaded by contractor with its own labour/machinery. Single rails (13 m) and Second hand Rails need to be transported as per instruction of Authority. Detailed scope of work is defined in Sch-B.**
- (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 per cent) 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 purposes 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 such as rails, sleepers and track fittings, signaling and telecommunication equipment, and power supply equipment. The Parties agree that all obligations and liabilities under this Agreement for the entire Railway Project shall at all times remain with the Contractor.

{The Parties further agree that works equal to at least 30% (thirty per cent) of the Contract Price shall be discharged solely by the Lead Member.}.

**Procurement of material, hire of equipment, or engagement of labour by the 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/EPC Agreement, the Concessionaire/Contractor 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/Contractor 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) reflects 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 the previous stage payment statement.
- 3.2.9 In case of dispute over the sum of the amount to be paid to the sub-Contractor or non-payment to the Sub-Contractor, Authority Engineer may raise the issue to the Contractor. After, issue has been raised, the 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 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- 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 4.3<sup>7</sup> before appointed date; and
  - (c) Chasing of GADs of road crossings, pipe lines and Utilities and getting NOC on GADs is to be done by contractor only. The contractor is responsible to get the GADs cleared from concerned authority for any crossing/utilities.
- 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 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 is 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.

#### **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 rates specified therein. The Parties agree that the monthly rate for each machine or equipment shall be inclusive of fuel and all other operating charges, which 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. 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.[1]

#### **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.**

#### **4.6 Disconnection for modification of existing signalling and telecommunication works.** Deleted

#### **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 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.



## Part III

# Construction

## ARTICLE 7

### PERFORMANCE SECURITY

#### 7.1 Performance Security

7.1.1 The 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 payment in an acceptable form / an irrevocable and unconditional Bank Guarantee (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.

The Performance Security shall be valid until 60 (sixty) days after the expiry of the Defects Liability Period specified in Clause 15.1.1. Until such time as the Performance Security is provided by the Contractor pursuant hereto and the same comes into effect, the “Bid Security” shall remain in force and effect, and upon such provision of the Performance Security, the Authority shall release the Bid Security to the Contractor. 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, 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 new technology not currently in use in the Railways, and the interlocking and telecom switching equipment, as specified in Schedule-B.

**\*Note (In case PG in for 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 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 an 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 31<sup>st</sup> day to 60<sup>th</sup> 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 % below 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 Money<sup>13</sup>

- 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.

## 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 percent ) 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 Roads, 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 for charted as well as uncharted utilities. Cost of such utility shifting unless otherwise specified will be under relevant items if G-1, if not available in G-1 then will be paid as change of Scope . 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 and the cost of the same is deemed to be included in the in EPC Mode

### **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 felling of such trees shall be the responsibility of the contractor (Except trees in the forest area which will be felled by Forest department and will be property of Forest Department) and such felled trees shall be the property of the Authority shall be disposed in such manner and subject to such conditions as the Authority may in its sole discretion deem appropriate. The trees in the forest area will be felled by the forest department itself. 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. 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: (*Software like Trimble Tilos need to be used for overall project planning and execution*)

**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 the contractor liable for penalty as decided by authority. The penalties recovered can be refunded if the contractor makes good use of the resources and achieves the 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**

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.

**10.2.1** 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 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 Deleted

10.2.5 Deleted

10.2.6 Deleted

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 to the Authority Engineer for review. Provided, however, that in respect of MEGA Bridges, Major Bridges, Structures, railway stations and yards, the Authority Engineer may require additional drawings for its review in accordance with Good Industry Practice. The Design directr to maintain close coordination with Proof consultant and shall be prompt in submitting replies to queries/compliances raised by Proof consultant on design and drawings within laid down timeline.
- (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 MEGA 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 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 including safety of Users, workers and equipment.

10.2.12 The contractor should submit a Manual for Safety, Health, Environment and Disaster Management During Construction detailing the provisions made by the Contractor for ensuring health, safety and proper disaster management at a major construction site which is to be prepared and got approved by the Authority

### **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 the 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 630th (six hundred and thirtieth) 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, the Authority may consider the request of the 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 the 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 a running track, may require prior sanction of the Commissioner of Railway Safety (CRS) before execution of such works are taken up by the Contractor. The 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 test 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 on 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.

### **Inspection charges**

Inspection charges of Superstructure (Composite Girder/Open Web Girder) and bearings of Major/MEGA Bridge(s) in factory/site inspection through RDSO/Zonal railways (as decided by the Authority) shall be borne by the contractor. All testing facilities and inspection accessories shall be arranged by the Contractor. All testing charges for calibration, testing of material, machinery, equipment, tool & plants as directed by the authority shall be borne by the contractor including submission of samples in the laboratory as directed by Authority Engineer. Day-to-day supervision of girder fabrication at workshop and launching shall be monitored by TPI agencies such as RITES Ltd., KRCL / CEIL, or any other agency approved by the competent authority, which shall be engaged by the contractor at its own cost.

## **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 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, after the appointed date the Contractor shall provide to the Authority every month, a drone video recording, which will be compiled into a digital video disc or any substitute thereof, covering the status and progress of Works in that period. The video recording shall be provided to the Authority no later than 15 (fifteen) days after the close of every month. A comparison Video should also be submitted of old drone video and new drone video with bridges, tunnels, stations, ROW duly marked and demarcated in video. This will help ascertain the progress accurately.

#### **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. The authority will carry out tests on completion within 30 days of receiving a request from the contractor. And if the Authority Engineer fails to carry out the test within 30 days, the Authority will pay damage to Contractor @ 0.02% of the payment pending for the 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 the 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 the 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 and Tunnels	No Limits
(b) For Items related to works other than foundation and tunnel	25%

**Note : In case variation beyond 25% is unavoidable, the variation in the quantities will be governed by following clause**

Unless otherwise specified in the special conditions of the contract, the accepted variation in quantity of each individual item of the contract would be upto 25% of the quantity originally contracted, except in case of foundation work and tunnel work (in which no variation limit shall apply). However, the rates for the increased quantities shall be as per sub- para below.

The Contractor shall be bound to carry out the work at the agreed rates and shall not be entitled to any claim or any compensation whatsoever upto the limit of 25% variation in quantity of individual item of works.

In case an increase in quantity of an individual item by more than 25% of the agreement quantity

is considered unavoidable, then same shall be executed at following rate

Quantities operated in excess of 125% but upto 140% of the agreement quantity of the concerned item, shall be paid at 98% of the rate awarded for that item in that particular tender; b. Quantities operated in excess of 140% but upto 150% of the agreement quantity of the concerned item shall be paid at 96% of the rate awarded for that item in that particular tender; c. Variation in quantities of individual items beyond 150% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender

Variation to quantities of Minor Value Item: The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed for other items). A minor value item for this purpose is defined as an item whose original agreement value is less than 1 % of the total original contract value. d.(i) Quantities operated upto and including 100% of the agreement quantity of the concerned minor value item, shall be paid at the rate awarded for that item in that particular tender; d.(ii) Quantities operated in excess of 100% but upto 200% of the agreement quantity of the concerned minor value item, shall be paid at 98% of the rate awarded for that item in that particular tender; d.(iii) Variation in quantities of individual minor value item beyond 200% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.

**If any item is omitted/missed in Schedule G-1A which are necessary for execution of the work, then such items will be added and dealt as per change of scope clause 13.2.3 detailed below.**

**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 therefore 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 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 in the order mentioned below;
- (A) If items are of USSOR, DSR then based on Latest Accepted Rates (LAR) available with Authority of various works being executed by other agencies i.e awarded rates. If items are NS items then those will also be payable as per LAR if available with Railways
  - (B) If LARs are not available then 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 through AOR, 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.
  - (C) 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 by Rate Analysis 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<sup>s</sup>, 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.

## 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 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 Railway Bridges, ROB, LHS, RUB, tunnels specified in Schedule B 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. Defects Liability Period for BLT shall be as per detailed specification and Railway Board guidelines specified along with this tender.

15.1.3 Deleted

15.1.4. Deleted

#### 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 a reasonable period as may be determined by the Authority Engineer. If the Contractors are 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 Deleted

#### 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 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)<sup>14</sup> of the Contract Price, for mobilisation expenses and for acquisition of equipment, which shall carry simple interest at the rate of Bank Rate plus 5% 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 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 1<sup>st</sup> 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 1<sup>st</sup> (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 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 installments 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 [MEGA 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 [MEGA Bridges and/or Major Bridges] and the payment due in respect of all other stage payments under the item [MEGA 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 7<sup>th</sup> (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 such as RFIs, check lists, Pour cards, Cube Test Reports, Shuttering/Scaffolding inspection report, Check Lists, Mill TC, Invoices etc. 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 10 (Ten) 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 05 (five) 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 (including Electrification related civil works) 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:<sup>15</sup>

- a) Price adjustment shall be applied on completion of the specified stage of the respective item of work in accordance with Schedule-G. The 1<sup>st</sup> 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 MEGA 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)  $VEW = 0.85 \text{ EW} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PF} \times (\text{Fi} - \text{Fo})/\text{Fo} + \text{PMACH} \times (\text{MACHi} - \text{MACHo})/\text{MACHo} + \text{POTH} \times (\text{OTHi} - \text{OTHo})/\text{OTHo}]$ ;

- (ii)  $\text{VBRIMP} = 0.85 \text{ BRIMP} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PS} \times (\text{Si} - \text{So})/\text{So} + \text{PF} \times (\text{Fi} - \text{Fo})/\text{Fo} + \text{PMACH} \times (\text{MACHi} - \text{MACHo})/\text{MACHo} + \text{POTH} \times (\text{OTHi} - \text{OTHo})/\text{OTHo}]$ ;

- (iii)  $\text{VBR} = 0.85 \text{ BR} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PS} \times (\text{Si} - \text{So})/\text{So} + \text{PF} \times (\text{Fi} - \text{Fo})/\text{Fo} + \text{PMACH} \times (\text{MACHi} - \text{MACHo})/\text{MACHo} + \text{POTH} \times (\text{OTHi} - \text{OTHo})/\text{OTHo}]$ ;

- (iv)  $\text{VTRK} = 0.85 \text{ TRK} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PS} \times (\text{Si} - \text{So})/\text{So} + \text{PF} \times (\text{Fi} - \text{Fo})/\text{Fo} + \text{PMACH} \times (\text{MACHi} - \text{MACHo})/\text{MACHo} + \text{POTH} \times (\text{OTHi} - \text{OTHo})/\text{OTHo} + \text{PR} \times (\text{Ri} - \text{Ro})/\text{Ro}]$ ;

- (v)  $\text{VTUNL} = 0.85 \text{ TUNL} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PS} \times (\text{Si} - \text{So})/\text{So} + \text{PF} \times (\text{Fi} - \text{Fo})/\text{Fo} + \text{PMACH} \times (\text{MACHi} - \text{MACHo})/\text{MACHo} + \text{POTH} \times (\text{OTHi} - \text{OTHo})/\text{OTHo} + \text{PXL} \times (\text{XLPi} - \text{XLPo})/\text{XLPo}]$ ;

- (vi)  $VOEW = 0.85 OEW \times [PLB \times (LBi - LBo)/LBo + PC \times (Ci - Co)/Co + PS \times (Si - So)/So + PF \times (Fi - Fo)/Fo + PMACH \times ((MACHI - MACHo)/MACHo + POTH \times (OTHi - OTHo)/OTHo];$
- (vii)  $VINVCIV = 0.85 INVCIV \times [PR \times (Ri - Ro)/Ro + POTH \times (OTHi - OTHo)/OTHo];$  and
- (viii)  $VINTGTESTCIV = 0.85 INTGTESTCIV \times [PLB \times (LBi - LBo)/LBo + POTH \times (OTHi - OTHo)/OTHo];$

#### 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 MEGA 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 PXL 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

$F_i$  = 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 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.



- (f) The following expressions and meanings are assigned to the value of the work done for signalling and telecommunication works: Deleted
- (g) Price adjustment for changes in cost of signalling works and telecommunication works shall be paid in accordance with the following formula: Deleted
- (h) The following percentages shall govern the price adjustment of the Contract Price for signalling and telecommunication works: Deleted
- (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);

MODLTTOUG = 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;

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

INVELECTRICAL = 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;

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

TESTCOM = 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)  $VOHE = 0.85 \text{ OHE} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PSST} \times (\text{SSTi} - \text{SSTo})/\text{SSTo} + \text{PCU} \times (\text{Cui} - \text{CUo})/\text{CUo} + \text{PINS} \times (\text{INSi} - \text{INSo})/\text{INSo}]$ ;
- (ii)  $VSP = 0.85 \text{ SP} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PSWGR} \times (\text{SWGRi} - \text{SWGRo})/\text{SWGRo}]$ ;
- (iii)  $VTRANSBOO = 0.85 \text{ TRANSBOO} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PSST} \times (\text{SSTi} - \text{SSTo})/\text{SSTo} + \text{PTR} \times (\text{TRi} - \text{TRo})/\text{TRo}]$ ;
- (iv)  $VTRANSAUX = 0.85 \text{ TRANSAUX} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PSST} \times (\text{SSTi} - \text{SSTo})/\text{SSTo} + \text{PTR} \times (\text{TRi} - \text{TRo})/\text{TRo}]$ ;
- (v)  $VTSS = 0.85 \text{ TSS} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PTR} \times (\text{TRi} - \text{TRo})/\text{TRo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PSST} \times (\text{SSTi} - \text{SSTo})/\text{SSTo} + \text{PSWGR} \times (\text{SWGRi} - \text{SWGRo})/\text{SWGRo}]$ ;
- (vi)  $VTLOH = 0.85 \text{ TLOH} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PSST} \times (\text{SSTi} - \text{SSTo})/\text{SSTo} + \text{PCOND} \times (\text{CONDi} - \text{CONDo})/\text{CONDo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PINS} \times (\text{INSi} - \text{INSo})/\text{INSo} + \text{POTH} \times (\text{OTHi} - \text{OTHo})/\text{OTHo}]$ ;
- (vii)  $VTLUG = 0.85 \text{ TLUG} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PPC} \times (\text{PCi} - \text{PCo})/\text{PCo}]$ ;
- (viii)  $VBAY = 0.85 \text{ BAY} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PSST} \times (\text{SSTi} - \text{SSTo})/\text{SSTo} + \text{PC} \times (\text{Ci} - \text{Co})/\text{Co} + \text{PCU} \times (\text{Cui} - \text{CUo})/\text{CUo}]$ ;
- (ix)  $VSCADA = 0.85 \text{ SCADA} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PELEX} \times (\text{ELEXi} - \text{ELEXo})/\text{ELEXo}]$ ;
- (x)  $VELEGWK = 0.85 \text{ ELEGW} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{POTH} \times (\text{OTHi} - \text{OTHo})/\text{OTHo}]$ ;
- (xi)  $VMODHTPWRLINE = 0.85 \text{ MODHTPWRLINE} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PSST} \times (\text{SSTi} - \text{SSTo})/\text{SSTo} + \text{POTH} \times (\text{OTHi} - \text{OTHo})/\text{OTHo}]$ ;
- (xii)  $VMODHTLTOUG = 0.85 \text{ MODHTLTOUG} \times [\text{PLB} \times (\text{LBi} - \text{LBo})/\text{LBo} + \text{PPC} \times (\text{PCi} - \text{PCo})/\text{PCo} + \text{POTH} \times (\text{OTHi} - \text{OTHo})/\text{OTHo}]$ ;

- (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)  $V_{EXTNLTPWRSPLY} = 0.85 \text{ EXTNLTPWRSPLY} \times [PLB \times (LB_i - LB_o)/LB_o + POTH \times (OTH_i - OTH_o)/OTH_o]$ ;
- (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)  $V_{CIVENG} = 0.85 \times V_{CIVENG} \times [PLB \times (LB_i - LB_o)/LB_o + PS \times (Si - So)/So + PC \times (Ci - Co)/Co + POTH \times (OTH_i - OTH_o)/OTH_o]$ .

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);

VTRANSAUX = 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);

VMODELETRICAL = 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 SCADA and related works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (k);

VCOMM = 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;

**COND<sub>o</sub> = Aluminium LME SELLER Settlement Price including Premium for AL Ingots and Customs duty published by IEEMA** for the month of the Base Month;

**COND<sub>i</sub> = 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;

**CU<sub>o</sub> = Copper: (Cu) Price of copper wire rod published by IEEMA** for the month of the Base Month;

**CU<sub>i</sub> = Copper: (Cu) Price of copper wire rod published by IEEMA** for the average price index of the 3 months of the quarter under consideration;

**ELEX<sub>o</sub> = The WPI for Manufacture OF Electronic Components** for the month of the Base Month;

**ELEX<sub>i</sub> = The WPI for Manufacture OF Electronic Components** for the average price index of the 3 months of the quarter under consideration;

**INS<sub>o</sub> = The WPI for insulators** for the month of the Base Month;

**INS<sub>i</sub> = 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;

$SWGRo$  = **The WPI for MANUFACTURE OF ELECTRICAL EQUIPMENT** for the month of the Base Month;

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

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

$TRi$  = 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

(k) The following percentages shall govern the price adjustment of the Contract Price for electrification works:

(i) For OHE, TSS, SP, Booster Transformer stations, Auxiliary transformer stations:

Component	Over Head Equipment except other work		Switch Posts except commissioning and charging,	Booster Transformer Station	Tracking sub stations except Commissioning and charging		Auxiliary transformer stations	OHE other works, commissioning and charging of TSS, SP, Booster Transformer stations, auxiliary transformer stations
	Foundation, mast erection, bracket, erection, insulators	Stringing of catenary and contact wire			Transformers	All works except trans-formers		
Labour (PLB)	13.55%	2.23%	15.55%	-	-	-	24.41%	24.84%
Cement (PC)	29.00%	-	12.99%	-	-	-	-	-
Structural steel (PSST)	50.44%	-	42.06%	-	-	-	-	33.25%
Insulators (PINS)	5.30%	-	1.99%	-	-	-	-	-
Copper wire (PCU)	1.70%	97.77%	0.84%	-	-	-	-	1.22%
Transformer (PTR)	-	-	-	-	-	-	75.59%	3.12%
Electrical Switch Gear (PSWGR)	-	-	26.57%	-	-	-	-	37.58%
Total	100%	100%	100%	-	-	-	100%	100%

(ii) For transmission lines overhead, underground high-tension cable transmission line, bay augmentation work at Grid Sub-station etc., various electrical general services works and modification of HT power lines and crossings (raising of height):

Component	Transmission lines overhead including monopole except commissioning	Underground high-tension cable transmission line except commissioning	Bay augmentation work at grid sub-station/ terminal arrangement at TSS	Various electrical general services work	Modification of HT power lines and crossings (raising of height)	Commissioning of transmission lines overhead, underground high-tension cable transmission line, bay augmentation work.
Labour (PLB)	-	-	-	32.74%	-	-
Structural steel	-	-	-	9.63%	-	-
Cement (PC)	-	-	-	3.62%	-	-
Conductor (PCOND)	-	-	-	1.62%	-	-
PVC Insulated Cable (PIC)	-	-	-	2.21%	-	-
Copper wire (PCU)	-	-	-	0.93%	-	-
Insulators (PINS)	-	-	-	0.18%	-	-
Other items (POTH)	-	-	-	49.06%	-	-
Total	-	-	-	100%	-	-

(iii) For SCADA, modification of HT power lines and crossings to underground (replacement by underground cabling), modification of LT power lines and crossings to underground (replacement by underground cabling except commissioning, Extension/augmentation of power supply for CLS work, extension/augmentation of general power supply, modification to existing electrical works:

<b>Component</b>	<b>SCADA except com-missioning for the Division</b>	<b>Modification of HT power lines and crossings to underground (replacement by underground cabling) except commissioning</b>	<b>Modification of LT power lines and crossings to underground (replacement by underground cabling except commissioning</b>	<b>Extension/ augmentation of power supply for CLS work except commissioning</b>	<b>Extension/ augmentation of general power supply</b>	<b>Modification to existing electrical works</b>	<b>Commissioning of SCADA, Modification of HT power lines, Modification of LT power lines, and Extension/ augmentation of power supply for CLS work</b>
<b>Labour (PLB)</b>	-	33.31%	33.54%	-	-	-	-
<b>Electronics (PELEX)</b>	-	-	-	-	-	-	-
<b>PVC Insulated Cable (PIC)</b>	-	38.07%	38.30%	-	-	-	-
<b>Fibre Cable (POFC)</b>	-	-	-	-	-	-	-
<b>All other commodities (POTH)</b>	-	28.62%	28.16%	-	100%	-	-
<b>Total</b>	-	100%	100%	-	100%	-	-



**(iv) Deleted****(v) For Civil Engineering Works: Deleted****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 Sq or Sb
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 (SQ /SB) 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 1<sup>st</sup> 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 Components		1A & 2	5A	6A	7	8A	9A	1B, 5B, 6B 8B & 9B	1C, 5C, 6C, 8C & 9C	5D,6 D, 8D& 9D	5E,6 E, 8E& 9E
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) 
$$L = \frac{(W \text{ or } WSF \text{ or } WF \text{ or } W_{SEL} \text{ or } W_{EL}) \times (L_Q - L_B) \times L_C}{L_B \times 100}$$
- (ii) 
$$M = \frac{(W \text{ or } WSF \text{ or } WF \text{ or } W_{SEL} \text{ or } W_{EL}) \times (M_Q - M_B) \times M_C}{M_B \times 100}$$
- (iii) 
$$F = \frac{(W \text{ or } WSF \text{ or } WF \text{ or } W_{SEL} \text{ or } W_{EL}) \times (F_Q - F_B) \times F_C}{F_B \times 100}$$
- (iv) DELETED

$$(v) \quad PM = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (PMQ - PMB) \times PMC}{PMB \times 100}$$

$$(vi) \quad S = \frac{(W \text{ or } W_S \text{ or } W_{SF}) \times (SQ - SB) \times SC}{SB \times 100}$$

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

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)

Lc % of Labour Component in the item(s) Mc % of Material Component in the item(s) Fc % of Fuel Component in the item(s)

PMc % of Plant, Machinery and Spares Component in the item(s)

Sc % of Steel Supply item Component in the item(s)

Cc % 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<sub>SFL</sub> 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<sub>FL</sub> 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.
- LB Consumer Price Index for Industrial Workers- All India: Published in R.B.I. Bulletin for the base period
- LQ 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<sub>B</sub> Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the base period
- M<sub>Q</sub> 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<sub>B</sub> 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<sub>Q</sub> 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
- P<sub>M<sub>B</sub></sub> 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.
- P<sub>M<sub>Q</sub></sub> 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<sub>B</sub> 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<sub>Q</sub> 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<sub>B</sub> Index No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the base period
- C<sub>Q</sub> 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 SQ or SB
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 (SQ /SB) 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 bein 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.

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 entities 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

## 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 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 08<sup>th</sup> 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 [Mumbai] 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 Contractor 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 [Churchgate, Mumbai] 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 an 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 08<sup>th</sup> 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 cases between Contractor & Authority, the jurisdiction shall be of Courts at Mumbai 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 [Mumbai] 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 [Mumbai] 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 [Mumbai] , 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 15<sup>th</sup> day from the date of signing of this Agreement,
- (b) the 30<sup>th</sup> 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;}<sup>s</sup>

**“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;
- (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

**“MEGA 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; }<sup>s</sup>

**“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;

**“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

SIGNED, SEALED AND

DELIVERED

DELIVERED

For and on behalf of

For and on behalf of

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

THE CONTRACTOR by:

(Signature)

(Signature) (Name)

(Name)

(Designation)

(Designati)

In the presence of:

1.

2.

{COUNTERSIGNED and accepted by:

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

## **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)  
Site

[Note: Through suitable drawings and description in words, the land, buildings, structures and track works comprising the Site shall be specified briefly but precisely in this Annex-I.]

**[For new railway line]**

**1. Site**

The Site of the Railway Project comprises the section commencing from Kulthana Yard inclusive km 28/970 to Rajpura Yard incl km 42/040 i.e. 13.07 Km section of Ratlam Mhow Khandwa Gauge Conversion in the State of Madhya Pradesh in the West 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	Kulthana Yard Incl.	Rajpura Yard Incl.	28/970	42/040	13/070	None

**3. a. Core Land**

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

Chainage		Left	Right
28+900	28+920	50.00	50.00
28+920	28+960	35.00	35.00
28+960	29+000	100.00	60.00
29+000	29+020	100.00	60.00
29+020	29+760	50.00	60.00
29+760	29+940	100.00	60.00
29+940	30+000	50.00	60.00
30+000	30+100	50.00	50.00
30+100	30+120	100.00	50.00
30+120	30+220	100.00	60.00
30+220	30+860	50.00	50.00

30+860	31+140	35.00	35.00
31+140	31+260	35.00	30.00
31+260	31+540	35.00	35.00
31+540	31+560	35.00	35.00
31+560	31+560	45.00	35.00
31+560	31+580	45.00	50.00
31+580	32+220	45.00	45.00
32+220	32+500	15.00	15.00
32+500	32+600	50.00	50.00
32+600	32+720	40.00	50.00
32+720	32+940	45.00	40.00
32+940	33+600	50.00	50.00
33+600	33+960	36.00	38.00
33+960	34+020	30.00	38.00
34+020	34+120	50.00	50.00
34+120	35+600	15.00	15.00
35+600	35+940	50.00	50.00
35+940	36+040	53.00	53.00
36+040	36+280	50.00	50.00
36+280	36+540	15.00	15.00
36+540	36+660	62.00	62.00
36+660	36+800	50.00	50.00
36+800	37+220	15.00	15.00
37+220	37+360	50.00	50.00
37+360	38+180	15.00	15.00
38+180	38+500	50.00	50.00
38+500	39+800	15.00	15.00
39+800	40+520	50.00	50.00



40+520	40+680	15.00	15.00
40+680	41+760	100.00	60.00
41+760	41+800	100.00	50.00
41+800	41+900	50.00	50.00
41+900	42+020	100.00	60.00
42+020	42+040	50.00	50.00

- Apart from ROW along the alignment the Authority has acquired approach roads and Dumping area in the forest land. These are attached as kml with tender document which shall form of the Non Core Land for the Project. These areas are to be used strictly in accordance with conditions imposed by Forest department as outlined in Sch A Annex IV

**Note:**

The Land width at some places in this stretch may not be sufficient for standard embankment/cutting profile. Therefore, embankment/cutting profile at such places may be required to be designed suitably with Retaining walls/Toe walls/Gabions/ Geo Grid/Geo Cell and other modern techniques etc. as approved by authority. Also, the contractor may be required to arrange private land on a temporary basis at his own cost for execution of work. Also, there is possibility of water stagnation and flowing water during rains along the Toe of embankment/cutting at some locations, therefore, the contractor shall design and construct suitable Toe walls, Catch water drains etc. The bidder is expected to conduct to site survey of these locations before bidding.

**b. Non Core Land**

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

**Dumping Areas and approach Roads as shown in kml between stretch 28970 to 42040 shall form Non Core Land for the Project**

4. **Details of existing structures and facilities on adjoining railway track (For doubling or 3<sup>rd</sup> line projects or electrification) - Not applicable in this tender.**

**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
	Double line	NIL				
	Single Line	NIL				

**4.2 MEGA Bridge**

The Site includes the following **MEGA Bridges**:

S. No.	Bridge No. and location	Type of Structure	No. of Spans with	Width (m)
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The Site includes the following Major Bridges:

S.	Bridge	Type of Structure			No. of Spans with span	Width
No.	No. and Location (km)	Foundation	Sub-structure	Super-str ucture	length(m)	(m)
NIL being GC in detoured alignment						

The Site includes the following Minor Bridges and culverts:

S. No.	Bridge No. and location (km)	Type of Structure			of Spans with span length (m)	Width of the bridge (m)
		Foundation	Sub-structure	Super-structure		
NIL being GC in detoured alignment						

S. No.	Block Section	km from	km to	Remarks
NIL being GC in detoured alignment				

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 <sup>n</sup>	Sub-structure	Super-structure		
NIL being GC in detoured alignment							

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
			Foundation	Super-structure			
NIL being GC in detoured alignment							

#### 4.8 Railway level crossings

The Site includes the following railway level crossings:

S. No.	Block Section	Chainage	LC No	TVUs	L C Classification	Remarks
NIL being GC in detoured alignment						

#### 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)
NIL being GC in detoured alignment						

#### 4.10 Railway yards

The Site includes the following railway yards:

Sr. No.	Name of Yard	Number of Lines	Remarks
NIL being GC in detoured alignment			

#### 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
NIL being GC in detoured alignment				

#### 4.12 Transmission lines crossing the Right of Way (To be filled by Electrical Department)

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

S.No.	Block Section	Chainage	HT/LT (Specify KV)	OH/UG	Height above RL/ Depth below RL
1.	Kulthana-Rajpura	Crossing data is To be surveyed and verified by the contractor at site. And scope shall be covered as per BOQ (Sch-G1)			

The cost for shifting of these transmission lines including charges for NOC, approval of shifting schemes, power block charges, other inspection charges or any other legal charges etc. shall be paid to the concerned owning department directly by the railway. However, getting NOC and Approval of schemes of diversion, getting estimates from owning authority, liasoning/coordination in this regard is the responsibility of the contractor. No claim on account of delay in execution of utility diversion will be entertained, except time extension as per provisions in this tender document.

#### 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
Crossing data is To be surveyed and verified by the contractor at site. And scope shall be covered as per BOQ (Sch-G1)				

#### 4.14 **Signalling infrastructure**

The Site includes the following signalling infrastructure: NIL

#### 4.15 **Telecommunication infrastructure**

The Site includes the following telecommunication infrastructure: NIL

#### 4.16 **[Any Other Structures]**

NIL

#### 4.17 **Non railway utilities (Way Leave facilities)**

Utilities are as under: (Not Available in Standard Document)

SN	Agency	Location of crossing (Chainage)
1		

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. (Not Available in Standard Document)

#### 4.18 **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 cannot 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 and are not mentioned in this document.** He shall bring the existence of all such utilities to the notice of Authority's Engineer immediately and consequently take further action as advised by the Authority's Engineer and as per conditions of this document. **Payment condition: Sch G1C**

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 Chainage to Chainage	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					Within 15 (fifteen) days of the signing of the Agreement or within 30 (thirty) days of the date of receiving the Performance Security from the Contractor, whichever is later.
(i) Full Right of Way (full width) a) Section	28/970-42/040	13.070	As per para 3 of Annex-I (Sch-A)		right of way available as per para 3 of Annex-I (Sch-A)
(ii) Part Right of Way (part width) a) Section	NA				NA
	Total length	13.070 km			
Part B					
Balance of the Right of Way not covered in Part A above.	NIL				There is possibility that some small patches might be left during land acquisition, which are still not in the knowledge of authority. As soon as these will come in knowledge, immediate necessary action will be taken.
(iii) Balance Right of Way a) Section b) Section c) Section	NIL				
Total length		**** km			

**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 (km)	Width (m)	Date of Providing Right of way
1	2	3	4	5
For OHE work (a) Kulthana - Rajpura- (b)	28/970-42/040	13.070		Simultaneously corresponding to the availability of ROW from Civil dept.
For Switching Posts (a) Kulthana SP (b) Rajpura SSP				Subject to approval of GPSD which is in the scope of Contractor.
For Signalling work (a) Station.... (b) Station.... (c) Relay hut For Telecom works Site for Telecom Towers , Cable Huts etc. (a)..... (b) .....	NIL			
Site for Service Buildings, Tower Wagon Sheds, Quarters (a) (b)	NIL			

\* Details to be provided for electrification works only.

Annex - III  
(Schedule-A)

**Plan and Profile**

**1. (a) Alignment Plans and other drawings**

The proposed alignment plan/L-sections, Engineering Scale Plans (ESPs) 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. ESP attached are tentative which may undergo minor changes during approval.

- 1.1 The Contractor shall review, verify and 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, the availability or lack of access, working space, storage, accommodation, restrictions imposed by the existing Indian Railways Tracks, the proximity of adjoining structures, 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.
- 1.2 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.
- 1.3 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.
- 1.4 The Permanent Works shall not infringe the Indian Railway schedule of dimensions and land Boundary limits provided by Railways.
- 1.5 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/change of scope shall be entertained by the Authority in case the Contractor encounters the data different than that included during the verification / additional investigation or actual execution of work. GT investigation and all types of surveys necessary for design shall form part of Scope of work and is deemed to be included in Schedule G (lump sum).
- 1.6 The Engineering Scale Plans are uploaded as part of the bid document given below. In case of any discrepancy in the detailing related to track in yard such as chainages of turn out, dead end, derailling switch, yard limit etc. between ESP and profile sheets, the detailing provided in the ESP shall prevail.
- 1.7 Contractor shall be abided with the guidelines of following manuals/guidelines/report/letters etc (including but not limited to), Up to latest correction slips/version/amendments.
  1. Indian Railways Permanent Way Manual,
  2. Indian Railway Bridge Manual,
  3. Indian Railways Schedule of Dimensions 1676mm Gauge (BG)
  4. Indian Railway Works Manual,
  5. Indian Railway construction manual,

6. IRS Bridge Rule,
7. IRS Concrete Bridge Code,
8. IRS Bridge Sub-Structures and Foundation Code,
9. IRS Fabrication and Erection of Steel Girder Bridges and Locomotive Turntables (IRS B1),
10. Manual on the Design and Construction of Well and Pile Foundations,
11. Steel Bridge Code,
12. IRS Welded Bridge Code,
13. Indian Railway Standard Seismic Code,
14. Indian Railway Code for the Engineering Department ,
15. National Building Code 2005,
16. Comprehensive Guidelines and Specifications for Railway Formation,
17. Railway Board letter no. 2011/CE-II/Form/Spec dated 14.09.2020,
18. Handbook on Railway tunnels (Nov-2018) published by IRICEN,
19. Guidelines for Cuttings in Railway Formations (GE:G-2), Aug 2005,
20. Guidelines on Erosion Control and Drainage of Railway Formation (GE:G-4, Feb 2005),
21. Guidelines on Soft Soils- Stage Construction Method (GE:G-5, April 2005),
22. Guidelines for Application of Jute Geotextile in Railway Embankments and Hill Slopes (RDSO/2007/GE:G-0008),
23. Guideline for Geotechnical Engineering Organization in Zonal Railways (RDSO/2007/GE:G-0011),
24. Guidelines for Civil Engineering Inspection, Maintenance and Safety in existing Tunnels (RDSO/2012/GE:G-0015),
25. Guidelines for safety in Tunnels during Construction (RDSO/2012/GE:G-0016),
26. Guidelines for Design & Construction of Tunnels (RDSO/2012/GE:G-0017),
27. Comprehensive Guidelines and Specifications for Railway Formation (RDSO/2020/GE:IRS-0004),
28. Guidelines for application of Coir Geo-textiles in railway embankments and natural hill slopes & cutting (RDSO/2020/GE: G-0022).
29. Schedule of technical Requirement for Fabrication of Steel girders (part A & Part B),
30. SPECIFICATION AND SCHEDULE OF TECHNICAL REQUIREMENT (STR) FOR MANUFACTURE AND SUPPLY OF ELASTOMERIC BEARING TO INDIAN RAILWAY FOR USE ON RAILWAY BRIDGES /ROB,
31. SPECIFICATION AND SCHEDULE OF TECHNICAL REQUIREMENT (STR) FOR



MANUFACTURE AND SUPPLY OF EXPANSION JOINT TO INDIAN RAILWAY FOR  
USE ON RAILWAY BRIDGES /ROB,

32. SPECIFICATION AND SCHEDULE OF TECHNICAL REQUIREMENT (STR) FOR  
MANUFACTURE AND SUPPLY OF POT PTFE BEARING TO INDIAN RAILWAY FOR  
USE ON RAILWAY BRIDGES /ROB,
33. Schedule of Technical Requirement for Fabrication of High Strength Friction Grip Bolting  
Assemblies with Direct Tension Indicator Washer (Suitable for preloading) for use in  
Railway Bridges, Rob & Fob. (w.e.f. 23.03.2023),
34. Specification for bolting assemblies with director tension indicator washers (BS-5-7.5.3.1-5),
35. Specification for Phased Array Ultrasonic Testing Procedure for Butt Welded joints in Bridge  
Girders,
36. IRS-B1 (up to latest correction slip),
37. Specification for Non-Electrolytically Applied Zinc Flake Coatings for HFSG Bolting  
Assemblies,
38. Specification for Higher-Strength Martensitic Stainless Steel for Bridge and Associated  
Structural Applications,
39. Guidance regarding QAP for online Vendor Application,
40. Revised Quality Assurance Plan (QAP) for Expansion Joint,
41. BS-125 - Method statement for Fabrication of 45.7 m through type Open web Grider for 25t  
loading drawing no. B-17181 series,
42. Guidelines for integrity testing of piles (BS-41-R1),
43. Guidelines for fabrication of steel girders for construction/field engineers (BS-110R),
44. Guidelines for carrying out of load deflection test of steel plate and open web and  
steel-concrete composite girders (BS-128R3),
45. RDSO GUIDELINES FOR CARRYING OUT RAIL-STRUCTURE INTERACTION  
STUDIES ON INDIAN RAILWAYS (BS 114 Version 2),
46. GUIDELINES FOR APPROVAL OF DESIGN BASIS REPORT FOR MEGA BridgeS  
REPORT NO. BS – 122 (R1),
47. BS-25, RDSO report on Guidelines on use of Admixtures in Concrete,
48. BS-28, Master List of Drawings of Bridges & Structures Directorate, RDSO.
49. BS-80, GUIDELINES FOR DESIGN OF POT-PTFE BEARINGS FOR RAILWAY BRIDGE
50. BS-117, Scour Depth Estimation, Countermeasures and Monitoring at Bridge Crossings:  
Guide for Engineers
51. REPORT NO. BS – 117 (R), RDSO GUIDELINES ON SEISMIC DESIGN OF RAILWAY

## BRIDGES (Version 1.0)

52. REPORT NO. BS – 118, GUIDELINES ON TYPE OF FOUNDATIONS FOR RAILWAY BRIDGES (BS 127).

53. REPORT NO. BS-138, GUIDELINE FOR INSPECTION, MAINTENANCE & CONSTRUCTION OF RUBs/SUBWAYs.

54. Indian Railways Manual ACTraction, Volume-II Part-I & II with latest corrections.

55. Manual of Standards & Specification for Railway Electrification with latest corrections.

56. Indian Railways Standards of Dimension with latest corrections. Any RDSO/CORE drawings, letters and RB's guidelines .

## 2) Enclosure A: Engineering Scale Plan

Sl No	Title of Drawing	Drawing No.
1	Kulthana(28 km/970 m) and Rajpura yards (42 km /040 m )	Tentative ESP copy attached in IREPS portal

## 3) Enclosure B: GADs

### 3.1 MEGA Bridges :

MEGA Bridges (3 Nos): Bridge number 57 (15\*30.5m CG), 59 (20\*30.5 CG), 65 (13\*30.5 m CG) is in the scope of work, Standard superstructure of RDSO for 25 T loading 30.5 m CG to be adopted along with its side pathway as indicated in RDSO drawings. DBR is also attached for reference, same shall be approved from CBE office Mumbai.

### 3.2 Major Bridges :

Major Bridges(6 Nos) : Bridge number 56 (1x18.30+1x30.5+1x18.30m CG), 60(7x30.50m CG), 61(3x30.50m CG), 62(4x30.50m CG), 63(1x30.50m CG), 64(6x30.50M CG), 67 (1x12.20m PSC Slab) is in the scope of work.

### 3.3 Minor Bridges :

Minor Bridges (3 Nos) : Bridge number 58 (1x6.10m PSC Slab), 59A ( 1x6.10m PSC Slab), 66( 1x6.10m PSC Slab), The authority has indicated 03 nos of PSC Slab bridges. The spans have been indicated in Scope of work, Schedule-B Annexure-I. Indicative GAD is enclosed with this tender document.

### 3.4 Canal Crossings Nil

### 3.5 RUBs Nil

The 00 Nos Road Under Bridges (RUBs)/Limited Height Subway (LHS) are within the scope of the contract. The site of RUBs/LHS implies the RUB/LHS proper and its approaches up to the connecting road for commissioning of the traffic. Further the site also includes locations having requirement of retaining walls, if any, for retention of bank and provision of U type approaches (i.e. retaining wall on sides of approach if required as per site condition, in case the RUB is located in

cutting) is also within the scope of work. Contractor shall make all necessary drainage arrangements including modification to the existing drainage arrangement to ensure no water logging at site including the construction of drains up to the outfall keeping the road level and the drain outfall in view. Sealing of joints and water proofing shall be within the scope of this work. RCC drain of suitable size in required gradient shall be provided by the contractor from the RUB Location to outfall as per requirements and site conditions in such a way that RUB/LHS remains in working condition in all weather and there shall be no waterlogging inside the RUB/LHS.

### 3.6 Study of site details and preparation of GAD

The development of GAD according to the site condition is within the scope of the contract. Contractor shall make a detailed study of the site condition and prepare GAD according to the prescribed specification, codes and manual provision and guidelines.

For the guidance of the contractor Authority has developed indicative and typical general arrangement drawings. List of typical general arrangement drawings is given in the table below. The Contractor shall inspect the sites and use these drawings for planning and ascertaining availability of ROW at each bridge site and submit detailed GAD of each bridge accordingly for processing approval.

#### a. List of indicative GAD for MEGA Bridges.

SI No	Type of Bridge	Type of Bridge	Remarks and Reference details of drawing
1.	Br No 57	Mega Bridge	Tentative GAD attached
2.	Br No 59		
3.	Br No 65		

NOTE: Refer updated RDSO standard drawings for superstructures. The design/drawing of substructure and other associated works shall be within the scope of EPC work.

#### b. List of indicative and typical GAD for Minor Bridges.

SI No	Bridge No	Type of Bridge	Remarks and Reference details of drawing
1.	58	Minor Bridge	Tentative GAD attached
2.	59A		
3.	66		

#### c. List of indicative and typical GAD for Major Bridges.

SI No	Bridge No	Type of Bridge	Remarks and Reference details of drawing
1.	56	Major Bridge	Tentative GAD attached
2.	60		
3.	61		
4.	62		
5.	63		
6.	64		

d. **List of indicative and typical GAD for Canal Crossing.**

SI No	Bridge No	Type of Bridge	Remarks and Reference details of drawing
1.	00	Canal Crossing	Nil

e. **List of indicative and typical GAD for RUB/LHS**

SI No	Bridge No	Type of Bridge	Remarks and Reference details of drawing
1	Nil	RUB/LHS	To be designed by contractor in consultation with Road authority.

f. **List of indicative GAD for ROB**

SI No	ROB No.	Chainage	Size	Drawing No.
1	Nil			

g. **List of indicative GAD for Tunnels**

S No	Tunnel No	Starting Chainage	End chainage	Length (m)	Tunneling Method	Drawing No
1.	T-8A	31600	32500	900	NATM	Copy of Indicative GADs along with dimensional cross sections attached on IREPS Portal
2.	T-9	34140	35610	1470		
3.	T-9A	36290	36540	250		
4.	T-10	36820	37220	400		
5.	T-11	37380	38190	810		
6.	T-12	38510	39790	1280		
7.	T-12A	40540	40680	140		

The Start and End chainages of the tunnel given above are tentative. The portals of the tunnel(s) may be required to be extended from a safety point of view. Other permanent safety arrangements against the falling boulders, rain water, loose soil, slope stability in terms of rock bolting/shotcreting/wiremesh, concrete canvas, catchwater drains etc. shall be within the scope of this work.

4. **Enclosure C: Longitudinal Section and Plan Drawings (Project Sheet)**

SI No	From Chainage	To Chainage	Drawing Number	Remarks
1	25000	30000	CAO(C) CCG / E-26929-A-RTM-KNW/L-SEC	Attached on IREPS portal
2	30000	35000	CAO(C) CCG / E - 26714-A - PTP-MKT -L-SEC	
3	35000	40000	CAO(C) CCG /E-26931-A-RTM-KNW/L-SEC	
4	40000	45000	CAO(C) CCG / 26932 -A- PTP-MKT /L-SEC	

The levels given in L-section are indicative and for guidance only. These should be rechecked, verified and modified by conducting site survey. Any change on account of existing 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 levels are to be validated by bidders before bid and hence no change of scope on this account is payable.

**5. Enclosure D: Standard RDSO drawings**

The above list is indicative and not exhaustive. Any other available standard drawing as required shall be made available and contractor can adopt the same with due approval from Authority's Engineer. In case of any alteration in these drawings, the latest drawing shall be followed.

**RDSO has made drawings public for access to all vide letter : CBS/SD dtd. 10.10.2025 attached with tender document. All latest drawings can be accessed from there.**

**NOTE:-**

- a. The above list is indicative and not exhaustive. Any other latest standard drawing as required shall be made available and contractor shall adopt the same with due approval from Authority's Engineer.
- b. The above mentioned enclosures are uploaded on IREPS portal.

## Annex - IV

*(Schedule-A)***Environment Clearances and Forest Clearances****1. Environment clearances\***

- (a) The following environment clearances have been obtained: Not Required.
- (b) The following environment clearances are awaited: ~~NA~~
- (c) Environmental clearance for Railway Projects is not required. However, during execution, the contractor has to abide by the instructions/rules in regards to the following and shall take necessary permission/approval from the concerned regulatory authority-
  - The Water (Prevention and Control of Pollution) Act, 1974
  - The Air (Prevention and Control of Pollution) Act, 1981
  - The Environment (Protection) Act, 1986, and Rules made thereunder
  - The Contractor shall obtain the necessary license from concerned state authority for the storage and the use of explosives.
  - Any other permission/approval required by statutory authority.

The provision of Construction and Demolition Waste Management Rule 2016 issued by Ministry of Environment Forest and Climate Change dated 29.03.2016 and published in the Gazette of India, Part – II, Section -3, Sub-section (ii) are binding upon the Contractor. Contractor shall implement these provisions at worksites.

**2. Forest clearances and Wildlife clearance**

The proposed railway project site is passing through the reserved forest land. It also passes sensitive area

The following clearances have been obtained:

- a. Stage-I forest clearance have been obtained vide MOEF&CC letter No. FP/MP/RAIL/427846/2023, dated 22.10.2025 with certain stipulations given below to be abided during the execution.
- b. Stage-II forest clearance Working permission has been obtained vide MOEF&CC letter No. FP/MP/RAIL/427846/2023, dated 10.03.2026 with certain stipulations given below to be abided during the execution..
- c. Final working permission granted vide MP govt letter No. F-5/E.F.-0404/I/955122/2026 dtd 17.04.26 with following conditions to be abided during execution of the project.
- d. Wildlife clearances are not applicable for this project
  1. Excavated muck/soil/debris of dismantled material, shall not be disposed of in forest land.
  2. The contractor shall not cut any tree in the forest area without permission of concerned

forest department.

3. No labour camp shall be established in the forest land.
4. The contractor shall provide alternate fuels preferably LPG to the labours and staff working at site, so as to prevent any damage and pressure on nearby forest.
5. No additional or new path shall be constructed inside the forest land for transportation of construction materials for execution of proposed work except those approved as diversion roads as acquired by Railway for purpose of transporting muck from tunnels
6. The forest land shall not be used for any purpose other than the implementation of the railway project.
7. The Contractor shall ensure that there is no damage to forest, wildlife flora fauna and its habitats.
8. Any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department
9. Care should be taken that no natural drainage gets obstructed during any stage of implementation of the project. Adequate water passageways need to be provided wherever applicable.
10. MS fencing all along the cutting at Railway Boundary to be erected as defined in Sch B
11. Construction materials (including top soil) should be procured from outside the sanctuary area or its eco-sensitive zone. The debris should be appropriately dumped outside the sanctuary and its eco sensitive zone by the contractor taking due care of air/dust pollution.
12. No construction material (such as sand, boulder) shall be procured from the river bed and no dumping of construction debris or discharge of waste water is to be done in streams in the Forest area.
13. The contractor in consultation with the State Government and Railway shall create and maintain alternate habitat/home for the avifauna, whose nesting trees are to be cleared in this project. Bird's nests artificially made out of eco-friendly material shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project
14. The contractor shall submit six monthly self-compliance reports as on 1st January and 1st July of every year to this office duly certified by railway field engineers for onward submission to the Forest Department. Biennial assessment of its activities to be submitted.
15. The designing of culverts/bridges, if any, over the natural streams/rivers/canals should be done in such a manner that it does not hamper the natural course of water, does not give rise to waterlogging, and also does not hamper movement of wild animals;
16. The reclamation of quarry, if any, should be done under the supervision of the State Forest Department. The quarry shall be reclaimed and afforested completely before the project is closed. Wherever dumping areas are there, reclamation after its use to be done
17. Slope stability to be provided in dumping areas and in actual alignment using retaining walls, breast walls and proper drainage and same shall be payable as defined in Sch B
18. Any condition that the Ministry of Environment, forest & climate change may stipulate

from time to time in the interest of conservation, protection and development of forest & wildlife.

19. Tree felling within the diverted forest area shall be carried out under strict supervision, and blanket felling shall be avoided as far as possible. It shall be undertaken only in a phased and need-based manner, strictly in accordance with the immediate and approved construction requirements of the project. A Joint Committee comprising a Senior On-site Engineer from the Railway and a Forest Officer not below the rank of Assistant Conservator of Forests (ACF) or Sub-Divisional Officer (SDO) shall be constituted to oversee the process. This Committee shall conduct a joint field inspection prior to the commencement of any felling activity, identify and prioritise trees for felling in different phases, and submit phase-wise reports to the concerned Divisional Forest Officer (DFO), who shall ensure that the felling is carried out strictly in the approved phased manner. A committee is already formed. Contractor to assist in conducting inspections, submitting planning for tree felling and liaison with state department for smooth execution of work.
20. The contractor shall take all necessary precautions to minimise tree felling and shall remove only those trees that are absolutely unavoidable for the execution of the project. Tree felling will be done by Forest department.
21. Noise Barriers at various nlocations to be installed as per instruction of Authority Engineer and Forest Department as defined in Sch B

NOTE: In case of any discrepancy in above conditions, the decision of forest department shall be final and binding to the contractor. Contractor has obligation to abide with these conditions and execute the work in adherence to those conditions. The cost for implementation of above forest and wildlife stipulations, except mentioned in tender document, is deemed to be included in the schedule G under EPC Mode. Contractor shall maintain strong liasoning with forest department to ensure smooth work execution and comply with all conditions as mentioned above.



SCHEDULE - B  
*(See Clause 2.1)*

**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.

**2      Specifications and Standards**

The Railway Project shall be designed and constructed in conformity with the Specifications and Standards specified in Schedule-B Schedule-D, and (Special conditions & List of Drawings/Plans attached).

## Annex - I

### (Schedule-B)

#### Description of Railway Project<sup>17</sup>

#### 1. Description of Railway Project

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 etc. 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.**

- a) The Scope of the Works to be performed under the Contract (hereinafter referred to as "the Scope of Work") comprises of Construction of Earth work, slope protection works, MEGA Bridge including H-Beam sleepers/PSC sleepers, Tunnels with BLT, Mega Bridges, Major bridges, Minor Bridges, Track Laying **with Contractor's own Material Supplies including BLT with all fittings, PSC sleepers, Turnout sleepers, Special sleepers (SEJ/Guard Rails, Points and crossing etc) with all matching fastening components, Points and crossings with all fittings complete, supply, laying, spreading of machine crushed stone ballast, H beams sleepers with all its fittings over Open web Girder, SEJs, Check rails, fish plates, welding with consumables (Flash butt and AT welding). Civil works for electrification (OHE foundation, BEC, OHE Fixtures in tunnels with all material), cable duct for Signalling and Telecommunication in the entire block section as per laid down specifications. New 260 m. long rails and Single Rails (13m/26m) for Main / loop lines/P&C shall be provided by the Authority free of cost. 260 m/26 m Long rails will be transported by EUR to site which shall be unloaded by contractor with its own labour/machinery. Single rails (13 m) and Second hand Rails need to be transported as per instruction of Authority.** All electrical works of OHE, general electrical works and cable duct related to Signal and telecommunication as described in this contract, from Kulthana (including) to Rajpura(including) as per the project length chainages.
- b) The proposed alignment of detoured GC rail line is located between Kulthana (including) station to Rajpura (including) on Kulthana-Rajpura section of Ratlam- Khandwa new BG rail line project in Western Railway. The total length of the proposed project is 13.070 km. At this stage, only single line is proposed to be constructed. However, provision of second line is also envisaged in near future as such the aspect of second line is to be kept in view while proposing overall design of the project and specifically bridges. In the present package, civil works consisting of earthwork, Rajpura station, bridges (Mega and minor), track tunnels are proposed to be constructed with speed **potential of 160 KMPH** with an axle load of 25 tonnes. Bridges are also to be provided for 25 tonne axle load along with Formation & sub structure. In addition, electrical, Signal and telecommunication works are also planned for integrated commissioning of the section.
- c) The general features are summarised as follows

Feature	Description
Length of the line	13.070 KM
Number of new Stations	02 Nos of station- KULTHANA & RAJPURA (C/L chainage – (28/970 to 42/040 )

Ruling gradient	1 in 150
proposed Gauge	Broad Gauge (1676mm)
a) MEGA Bridge	a) 03 Nos
b) Major Bridge	b) 07 Nos
c) Minor Bridge	c) 03 Nos
d) FOB	d) 02 No
e) Platforms	e) As per ESP and Sch B
f) Station building incl all civil works, circulating area, Approach roads	f) As per Sch B
g) Tunnels	g) 7 number
h) Electrification work	h) As defined in scope of work, Sch A, B,C,D
i) Cable duct	i) As defined in Sch A , B, C,D in entire block section

- d) The present contract package is a part of Ratlam-Khandwa GC rail line project under which work is already in progress in other sections. The contract is an integrated contract in which civil and track work is planned to be carried out. The proposed Single Line Railway shall be capable of operating at a speed potential of 160 km/h, involving appropriate Design and Construction of formation in Embankments/ Cuttings, earthwork and backfill in approaches of MEGA Bridge, Minor Bridges, RUBs including approaches which shall be confirming to the overall proposed alignment of the project.
- e) 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.
- f) All Site investigations, Geo-technical surveys, hydrological survey, alignment finalisation, bridge planning, bore holes, ancillary works related to electrification and signalling, record keeping, material testing, inspection reports etc. shall form part of scope of Works for successful completion of Permanent Works related to the project. Ancillary works includes provision of core hole/pedestals for OHE mast over Abutment/pier cap on both side, passing of cable duct for electrical/S&T cables in tunnels and MEGA Bridge etc.
- g) The construction of temporary access road(s) for execution of all works related to the scope of this tender, in Railway ROW or outside (arranged by the contractor at own cost), shall be the complete responsibility of the contractor and the cost of the same is deemed to be included under schedule-G. At tunnels where approach road have been acquired from Forest as shown in kml, development of that approach road to be done and maintained throughout during
- h) All preparatory works associated with CRS inspection and commissioning including painting, white washing, colour washing, lettering etc as per directions of the Authority Engineer shall be arranged by the contractor, the rates for which are deemed to be included in the Schedule G.

## 2. Construction of Civil and Track Works

All works in connection with Construction of GC line in Km 28/970 to 42/040 in between Kulthana and Rajpura stations in connection with Ratlam Mhow Khandwa Gauge Conversion and dismantling of existing structures (if any) in the State of Madhya Pradesh are to be executed by the Contractor. The material released from dismantled structures shall be the property of the contractor(except in Forest area). OHE foundation, OHE fixing arrangement in tunnels shall be within the scope of this contract.

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 into 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, hydrological survey and Geotechnical Investigations etc. throughout the Contract. Any approval 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.

Earthwork, blanketing, slope protection, MEGA Bridge, Major Bridges, Minor bridges, Tunnels, Station building, Track works and other miscellaneous Civil works in Km 28/970 to 42/040 in between Kulthana and Rajpura stations in connection with Ratlam Mhow Khandwa Gauge Conversion and dismantling of existing structures (if any) (**Excluding S&T works**) in the State of Madhya Pradesh are to be executed by the Contractor.

Scope of Electrification work is defined in upcoming para 18 of this Sch-B

For faster construction of structures (other than bridges) with quality standards, precast construction should be taken up to the extent possible, ensuring good quality concrete with steam curing and having NABL accredited labs for quality control measures.

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:

#### **i) 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) Survey of all railway and non-railway utilities.
- f) Preparation and approval of Plan and profile and GADs
- g) Design of Structures
- h) Execution of construction works at site
- i) Safety at Work Site

## ii) CIVIL WORKS

- a) Design and Construction of formation (Earthwork and blanketing)
- b) Design and Construction of MEGA Bridge
- c) Design and Construction of Major Bridges
- d) Design and Construction of Minor Bridges
- e) Design and Construction of Tunnels
- f) Design and Construction of station building, platforms and associated civil works.

### 2.1 Operational Requirements

The Permanent Way shall be single line and designed to permit the Authority to operate satisfactorily at a maximum design speed of 130 km/h. All curves to be designed with Transition length for 130 kmph and cant to be provided as per sectional speed/ route classification as per IRPWM. All the bridges and formation shall be constructed for an axle load of 25T considering 160 kmph speed

### 2.2 Alignment

**2.2.1** The alignment of the Railway Project shall be as per the alignment plans given in Schedule- A, Annex III. 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 it 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.

**2.2.2** The Contractor shall design the horizontal and vertical Alignment as per the Design Criteria specified in the Design Standards and within the available ROW giving due consideration to the various obligatory points e.g. existing Bridges, Level Crossings, ROBs etc.

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.

**2.2.3** 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.

### **2.3 Geometric design and general features**

- 2.3.1 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.
- 2.3.2 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.
- 2.3.3 The ruling gradient of the section on the main line shall be 1 in 150 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 other such obligatory locations, the gradient shall be governed by requirement to maintain the predefined levels and contractor shall provide gradient flatter than 1 in 150 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.
- 2.3.4 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 Authority. Dismantling of buildings as per the agreed and Approved dismantling plan and disposing off the released material of these buildings to stock holder/outside railway boundary are part of the scope of this contract.
- 2.3.5 Security of Material- The Contractor shall be responsible for the security of the site for the 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 coordinate 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 coordinated 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).
- 2.3.7 Safe Working- Contractor shall be fully responsible for safety of trains running on existing track in all respect and fully follow the instructions laid down by Railways for "Safety At Worksite"

### **2.4 Earthwork & Blanketing:**

- (i) Earth work in formation shall be designed according to the type of existing soil and to be used for making embankment. The design of blanketing material and thickness shall be decided as per RDSO specifications and Railway Board Guidelines and got approved from Competent Authority. Natural material Blanketing will be not allowed. The soil conforming the SQ1 classification shall not be allowed in the earthwork above the lower fill. 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 (>4 m high) and cutting > 4 m deep. If any slope stabilisation is to be done in filling/ cutting by provision of Geocell/ geogrid/shotcrete/rock bolt any other methodology, same shall be got approved from Authority Engineer

- (ii) Latest RDSO guidelines shall be used while designing earth work and blanketing layer. Minimum berm of 3 m to be provided in earthwork in cutting, Catch water drain of 0.5 m by 0.5m on each berm to be provided as per approved drawing
- (iii) Non woven geotextile to be invariably provided as per RDSO IRS GE 0004 specifications between blanket and subgrade in filling section and where blanket is done in cutting section where there is no hard rock. No filter criteria will be applicable and wont be checked as Non Woven geotextile is to be provided compulsorily.
- (iv) Side slopes to be 2:1 H:V for filling/embankment locations with necessary berms of minimum 3 m wide. Slope stability analysis for >4 m embankment height to be done
- (v) Contractor has to carry out GT as per IRS GE 0004 for formation and undertake ground improvement wherever required 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. **In cutting sections, formation width to be widened necessarily to accommodate space for cables/utilities behind side drains. The clear width behind side drains must be minimum 1 m each on both sides of track**
- (vi) In cutting section, side slopes in cutting to be as per RDSO guidelines IRS GE-004/2020 and IRS GE/G-2 Guideline for cutting. Minimum Side slopes to be 1.5:1 in sandy soils, 1:1 soil/weathered/soft rock, 0.5:1 for hard rocks. The side slopes should be duly supported by slope stability calculations and such analysis need to be done for cutting more than 4 m deep.
- (vii) All excavated material from cutting and tunnel is the property of the contractor. All usable earth/good-quality excavated muck generated from cutting and/or tunnel excavation may be utilized free of cost in any Railway work, subject to compliance with the relevant Railway codal provisions, specifications, and guidelines applicable to the intended use of such material.
- (viii) All surplus, unused, or unserviceable spoil/excavated material shall be disposed of by the Contractor outside Railway land at his own cost and responsibility. No unused excavated material shall remain within Railway premises after completion of the work.
- (ix) No muck/spoil shall be dumped in any forest area, except at the designated dumping yards approved/taken over by the Authority, which shall be used exclusively for disposal of excavated muck from cuttings and tunnels, strictly in accordance with the instructions of the Forest Department and all conditions stipulated in Stage-I, Stage-II Forest Clearances, and Working Permissions. The Contractor shall maintain continuous liaison and coordination with the Forest Department in this regard.
- (x) The Contractor shall be solely responsible for payment of all applicable royalty charges, levies, cess, or other statutory dues to the concerned Mining Department or any other competent authority, as per applicable State/Central Government Acts, Rules, and Regulations. The Contractor shall submit, along with each RA Bill, a self declaration certifying that all applicable royalties and statutory dues for the executed earthwork have been duly paid as per the applicable laws/mining rules. Any liability arising out of non-payment or short payment of royalty or statutory dues shall be borne entirely by the Contractor.

- (xi) Further, upon completion of the work and before release of the Final Bill, the Contractor shall submit a final clearance certificate/NOC from the concerned Mining Department or other applicable Government authority confirming that all royalties, levies, and statutory dues pertaining to the project work have been fully paid and no outstanding liability exists.
  - (xii) During disposal/dumping of muck outside Railway land and forest areas, the Contractor shall ensure that no natural nallah, pond, drainage channel, canal, road, pathway, pedestrian access, animal trail within forest areas, watercourse, or any other public or natural right of way is obstructed, blocked, diverted, or adversely affected in any manner. The Contractor shall make adequate arrangements to maintain free flow of water and uninterrupted movement/access at all times during execution of the work.
  - (xiii) Provision of trolley refuges in cutting and filling are to be provided as per IRPWM and latest guidelines
  - (xiv) MS fencing (as per design approved by Authority Engineer )to be installed at locations as per instruction of A.E. at railway boundary in the section in consultation with Forest department.
- 3. Work includes 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 MG Track structure if applicable/falls in alignment if any.
  - (b) Removing, screening & stacking of released ballast.
  - (c) Clearing & Grubbing and Stripping,
  - (d) Excavation with or without Blasting,
  - (e) Embankment,
  - (f) Sub-Grade,
  - (g) Blanket Layer,
  - (h) Slope Protection & Erosion Control
  - (i) Additional formation width behind side drains minimum 1 m each side of track in cutting for cable/utilities For Rock Cutting Areas, following shall also be included
    - (b) Provision of Berms as per design(minimum 3 m)
    - (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.(with its latest correction slips) RDSO GE/G-2 Guidelines for cutting April 2005.

- 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.
- Work to be done as per typical cross section which must be got approved from Authority Engineer.
- Turfing of side slopes to be done at filling locations as per approved scheme.
- All items mentioned above for Earthwork and blanketing including its design and Geotechnical investigation are included in scope of work.
- Retaining wall/toe wall if required at any location for formation to be designed by contractor. Execution of retaining wall as per approval of authority engineer is in scope of work

**(a) Scope of work covered under the schedule G (under EPC mode) shall be as follows:**

- Design of Earthwork, slope stability analysis of earthwork in cutting and filling, GT survey for formation design
- Earthwork in formation for embankment
- Earthwork in cutting for embankment for track, side drains and cable ducts all along the section
- Complete execution of Side drains in cuttings
- RCC central drains, 2 nos., in each yard
- Blanketing
- Turfing of side slopes of bank in formation
- Non-woven geotextile between blanketing and subgrade
- Provision of trolley refuges in entire section
- Any other item not covered under Sch-G1
- Excavation of catch water drain on berms in cutting is part of formation in cutting and included in Sch G

**(b) Scope of work covered under the schedule G-1 (under BOQ basis) shall be as follows:**

- (i) Slope protection works like geocell, geogrid, shotcreting, rock bolting or any other methodology in cutting/ filling.
- (ii) Mitigation measures against Rock fall in deep cuttings
- (iii) Retaining walls/ toe walls, where land is short of toe of bank.
- (iv) MS Fencing along the cutting section as per requirements.
- (v) Excavation and complete execution of catch water drain at toe of cutting as per approved drawing
- (vi) Execution of catch water drain (except excavation) on berms in cutting

**4 Bridges (Mega, Major, Minor):**

- 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 Indian Railway Construction 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 Mega/Major/Minor bridges/RUB/ROB should be

designed and to be constructed as per the latest guidelines of RDSO.

- 4.2** All bridges shall be designed for the following minimum recurrence interval of floods:
  - a) For Mega and Major Bridges: 1 in 100 years
  - b) For Minor Bridges: 1 in 50 years
- 4.3** GAD given along with the tender document is tentative only. Type of foundation, sizes of Abutment/Pier may change as per design. Span configuration may also change, if required by the authority or as per design requirements. However, efforts shall be made that the superstructure shall be as per standard RDSO approved drawings. GAD provided are tentative which needs to be revalidated by contractor and got approved from Authority.
- 4.4** Minimum size of RCC box shall be in accordance with the specifications and standards.
- 4.5** Provision of drop wall, curtain wall, flooring, toe wall, pitching etc. as proposed and approved drawings by Authority. (Note: In all major/megabridges, 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.)
- 4.6** Formation width at the approach of Mega/major Bridges shall be 10 m for a length of 50 m both sides.
- 4.7** Transition system to be provided at Mega/Major bridges in accordance with RDSO GE-50/Rev-2.
- 4.8** The Contractor's design shall recognise that the new bridges are to comply with the vertical clearances and freeboard as set down in the applicable standards, irrespective of the vertical clearance and free board of the adjacent Bridge. However, for relaxation in freeboard/ 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 etc.
- 4.9** The contractor to conduct RSI analysis of bridges as per IRPWM and BS-114 Revision-2 Aug 2016 or latest guidelines issued by RDSO/Railway Board. RSI report to be submitted along with bridge design. Design of the bridge substructure must be done so as to make LWR through on all bridges.
- 4.10** The planning and design of River training works like Guide Bund shall be prepared by the contractor as per site requirements for approval of the competent authority.
- 4.11** The formation and new track shall be designed with smooth curves with speed potential of 130 KMPH and laid accordingly. This aspect shall be kept in view while carrying out bridge design. Trolley refuges to be provided as per IRPWM on bridges
- 4.12** Side pathway on all bridges to be provided in the form of T slabs both side of track on slab bridges as per RDSO RDSO/B-10294, on OWG one side as per RDSO drawing CBS-0045 (Alt-3, 03.02.2025), on Composite girder one side RCC pathway as per RDSO drawing included in deck slab. Inspection arrangement of Top chord in OWG to be provided as per drawing SSE/Bridge/BRC/2020/01 attached
- 4.13** Contractor to carry out Survey, Geotechnical investigation, GAD preparation/validation and

design of substructure, foundation, toe wall, return/retaining wall of MEGA, major, minor Bridge, LHS/RUB, ROB, conducting RSI analysis, design of bearings if required.

- 4.14** Provisions of RDSO report no. BS-111 (revision-7 or latest revision) “Guidelines for use of High Strength Friction Grip (HSFG) bolting assemblies on bridges on Indian Railways” shall be followed including provisions for anti theft and anti sabotage measures.
- 4.15** **Inspection charges** of Superstructure (Composite Girder/Open Web Girder) and bearings of Major/MEGA Bridge(s) in factory/site inspection through RDSO/Zonal railways (as decided by the Authority) shall be borne by the contractor. All testing facilities and inspection accessories shall be arranged by the Contractor. All testing charges for calibration, testing of material, machinery, equipment, tool & plants as directed by the authority shall be borne by the contractor including submission of samples in the laboratory as directed by Authority Engineer. Day-to-day supervision of girder fabrication at workshop and launching shall be monitored by TPI agencies such as RITES Ltd., KRCL / CEIL, or any other agency approved by the competent authority, which shall be engaged by the contractor at its own cost.
- 4.16** Cost of inspection of bearings by TPI/Railway to be borne by contractor
- 4.17** Hume pipes shall not be used for crossing of railway tracks.
- 4.18** **Scope of work covered under the schedule G-1 (under BOQ basis) for all bridges shall be as follows:**
- Excavation for all types foundation of pier, abutment, toe wall, return wall
  - Execution of pile work for foundation of bridge
  - Substructure including abutments, piers, pier caps, abutment caps, Wing/return wall behind abutment, pedestal, inspection platform, dirt wall on abutment, dowel box/seismic restrainer, pile/open/well foundation.
  - All the shuttering for bridge foundation/substructure/pier abutment caps/inspection platform/return/wing wall/toe wall, filling inside hollow pier if any as per design and standards requirement.
  - Pier protection against flowing objects as per approved drawing, the execution of River training works like Guide bunds etc (required if any)
  - Cement, reinforcement steel of all such execution mentioned above.
- 4.19** **Scope of work covered under the schedule G (under EPC mode) shall be as follows:**
1. All design and drawing of bridges including GT/ any other survey work, RSI analysis
  2. Complete Superstructure including supply of steel, fabrication, erection, launching, metallising, painting, HSFG bolting as per RDSO specification and guidelines as approved by the authority. All superstructure shall be RDSO standard for 25 T loading. No change of scope is admissible for items under Schedule G of superstructure and bearing except when overall bridge length changes. **Span arrangement, type of superstructure and span configuration as defined here in this tender for all bridges is fixed and can not be changed. If there is technical requirement to change overall length of the bridge due to site conditions then same shall be dealt as change of scope in Superstructure and bearing of bridge item of Sch G**

3. Superstructure of all types of bridges including PSC slabs, Composite girder including Deck of composite girder with its sacrificial shuttering, cement, steel, concrete
4. Associated Load testing of railway girder as per Railway codes/manuals/Railway Board guidelines
5. Sacrificial shuttering for casting of deck of superstructure to be used compulsorily in all composite girders including ROBs which shall be Galvanised cold rolled cold annealed steel CRCA of suitable thickness whose drawing to be got approved from A.E. before execution.
6. Design, supply, erection/installation of bearing as per design of any type (Elastomeric, POT PTFE, spherical, cylindrical, rocker roller or any other type ) on all bridges. QAP for bearings to be approved by Authority. The bearing shown in attached GAD are only indicative, bearing will be provided as per design. No change of scope on this account will be admissible if bearing shown in GAD is changed to some other bearing as per design.
7. Side pathway on all bridges to be provided in the form of T slabs both sides on slab bridges as per RDSO RDSO/B-10294, on OWG one side as per RDSO drawing CBS-0045 (Alt-3, 03.02.2025), on Composite girder one side RCC pathway as per RDSO drawing of deck slab. Inspection arrangement of Top chord in OWG to be provided as per drawing SSE/Bridge/BRC/2020/01 attached
8. Supply, fabrication, erection, painting of Pathway (at bottom chord as well as top chord including safety railings), gangway on H beam sleeper, trolley refuse/man refuse, railings for inspection platform (on Abutment caps/Pier caps) etc. including painting as per approved drawings for inspection purposes shall be part of this tender under EPC mode. Cost of inspection by Railway/TPI for H beam sleepers to be borne by contractor. Work to be done as per approved QAP of H beam sleepers.
9. Supply, fabrication, painting, erection of Chequered plate to be used in trolley refuses, man refuses, pathway, gangway etc shall be in accordance with approved drawings and as per Railway specifications
10. Supply, fabrication, erection of MS ladder duly painted as per specifications for inspection of Top chord of girders and for inspection of bearings
11. Construction and dismantling of coffer dam (if required) is included in Sch G
12. Track work on bridges H-beam sleepers/Concrete sleepers with all fittings, fixtures, fasteners, rubber pads etc as per IRS specifications including supply, fixing of metallising of H beam sleepers in all terms as per relevant specifications. The Fixing of secondary rails/rails including local leading, handling, all leads & lifts .
13. Construction of bridge approaches with required backfilling and filter media with a transition system as per railway board's letter no. GE/Gen/112-Transition, dated 06.08.2024 as per RDSO GE R-50 Revision 2 shall be within the scope of this contract.
14. Stone pitching along with graded filter below pitching on approaches of bridges upto PFL shall be minimum 30 m on major/mega bridge and 15 m in minor bridges. If there is requirement of more as per design then same shall be provided accordingly. Bridge board Shall be erected on bridges as per latest guidelines at both approaches of the bridge as per Standard IRS specifications.

15. Provision of flood gauge, Danger level, HFL marking etc shall be marked as per Indian railway Bridge Manual
16. Painting by coal tar/bituminous black paint of bridge structure buried below ground as per relevant railway code/manual/specifications.
17. Contractor to install CCTV IP based video recording system at all major/important bridges/tunnels/locations of piling work/any other locations where hidden items are involved as per instruction of A.E as per RB letter 2023/W-I/Gen/Gatishakti dtd 26.03.2025 attached as Annexure. The permanent recording of each site to be handed over to A.E after completion of work at each site. Live recording also need to be shared with A.E for live monitoring. Same is deemed to be included in Sch-G. Contractor to maintain complete history of each bridge/tunnel construction by recording proper photos/videos and same shall be submitted in the form of booklets and videos before CRS inspection
18. Boulder backing behind abutment, return wall at bridges, pitching on bridge approaches, Flood gauges, DL, HFL marking, inspection steps, bridge boards, railings on inspection platform, bridge plaques and bridge tablets as per IRBM on all bridges are under Sch-G
19. All the track on bridges including all materials (except main line rails, secondary rails, guard rails), sleepers approach SEJs, guard rail fabrication, installation, welding as per approved LWR plan
20. Design of falsework/form work/shuttering to be got approved from A.E., work to be done as per approved drawing
21. Any tests required as per QAP and latest Railway Board guidelines to be done like Pile integrity test, CHUM test, Pile load tests etc. CHUM test to be done on 100 % of piles. Load test for span
22. No additional payment for dewatering during execution of bridges will be given. All the cost of dewatering is included in Sch G
23. Any other work not included in Sch- G1 is deemed to be included in Sch G.

**4.20 MEGA Bridges** shall be constructed at the following locations:

Sr.No.	Bridge No.	Approx. center Chainage	Tentative Span Arrangement
1.	57	30591	15 x 30.5 Composite steel Girder
2.	59	33270	19 x 30.5 Composite steel Girder
3.	65	40183	13 x 30.5 Composite steel Girder

**4.21 Major Bridges** shall be constructed at the following locations

Sr.No.	Bridge No.	Approx. Chainage	Span Arrangement	Type
1.	56	29836	1x18.30 + 1x30.5 + 1x18.30	Composite Steel Girder

2.	60	35767	7x30.5	Composite Steel Girder
3.	61	36172	3x30.5	Composite Steel Girder
4.	62	36660	4x30.5	Composite Steel Girder
5.	63	37288	1x30.5	Composite Steel Girder
6.	64	38347	6x30.5	Composite Steel Girder
7.	67	41344	1 x 12.20	PSC Slab

**4.22 Minor Bridges** shall be constructed at the following locations:

Sr. No.	Br. No.	Proposed Location (Chainage)	Span configuration (meter)	Structure Type
1.	58	32665	1 x 6.10	PSC Slab
2.	59A	34004	1 x 6.10	PSC Slab
3.	66	40790	1 x 6.10	PSC Slab

Note: Tentative GADs are enclosed in relevant sections of the document.

**4.23 Canal crossing**  
NIL

**4.24 Railway flyovers**  
NIL

**4.25 Road under bridges (RUB)**

- (1) Road Under Bridge shall be provided at the following crossings as per GAD attached (For the scope of this document, term “Limited Height Subway (LHS)” or “Road under Bridge (RUB)” is used interchangeably and they shall be treated as “one and same” irrespective of their standard definition; however, for more details of such structures, GAD(s) attached with this document in relevant section, shall be referred to):
- (2) The list of RUBs required to be constructed in this project is as follows:

Sr. No.	Bridge No.	Proposed Location (Chainage)	Span configuration (meter)	Barrel Length (mm)	Structure Type
					NIL

- (3) The scope of RUB work implies the RUB proper and its approaches up to the railway boundary. The contractor shall carryout road work up to the connecting road for commissioning of traffic and shall make all necessary drainage arrangements to ensure no waterlogging at site. Further requirement of retaining wall, if any, for retention of bank and provision of U type approaches (i.e. retaining wall on both sides of approach if required as per site condition, in case the RUB is located in cutting) is also within the scope of work. The surface of the road shall be of designed rigid pavement. The contractor shall provide height gauges to suit the requirements of RUB/LHS. As far as possible, height gauge shall be as per

approved RDSO drawing and standard signage as per the provision of IRC specifications. In case, where additional clearance is required, RDSO drawing shall be referred for guidance and may be modified to a limited extent in terms of height with the approval of Authority Engineer.

- (4) Sizes of the RUB/LHS given above and as given in tentative GADs are for guidance only. These are subject to change as per site/public requirements and the construction of the same shall be within the scope of EPC mode and no change of scope shall be entertained on this account.
- (5) The list of RUB/LHS given above is tentative. The Barrel length of individual bridges given above are tentative as per GAD and subject to change as per final design. No change of scope is admissible for items under Schedule G of superstructure whose span configuration remains same/unchanged as those proposed by Authority here in the tender.
- (6) Retro reflective Signages for RUB/LHS shall be provided all along the road and on height gauges as per IRC guidelines and specifications.
- (7) The scope of work also includes but not limited to, providing proper drainage, weep holes, inspection arrangement as required and safety precautions for safe traffic on the existing/diverted road. The contractor shall construct and maintain the road diversion till the permanent restoration of road traffic through RUB/LHS.
- (8) Indicative typical drawings are enclosed along with the tender document. The contractor is required to develop detailed GAD for each RUB which shall be approved by the authority. The details of existing RUBs have been provided in the enclosed drawings, however, for developing final GAD, the contractor shall inspect and examine the site of all RUBs carefully and shall propose the temporary diversion arrangement in consultation with Authority Engineer and local/ State govt authorities. It will ensure that the traffic on the existing road is not adversely affected. Further, the land required, if any, for temporary diversion shall be arranged by the contractor at his own cost by hiring. Any permission/liaising required with state govt/local govt to be done by contractor only. Getting/chasing NOCs for closure, GAD approval rest with the contractor
- (9) The site of work in case of all RUBs shall include the approach connectivity to the existing road and all works related to approaches including road and retaining wall work which shall be within the scope of work. The geometric as well as structural design of road approaches shall be confirmed to the relevant IRC codes and railway guidelines. The contractor shall design all the approaches within the available ROW and shall not claim for any additional ROW.
- (10) Approach ramp/road as per design specifications, including earth retaining structures, as required on both sides of the approach road to connect RUB across proposed tracks with the existing road(s). In case of limited drainage issues, both sides of the approach road shall be provided with roofing as approved by the authority. The roofing and any other preventive measures shall be provided by the contractor, in case the gravity drainage is not feasible as per design submitted by the contractor.
- (11) Drainage of the RUBs across proposed tracks and approach ramps including drainage hump at the start of the approach ramp, Height Gauges at the start of the approach road in accordance with RDSO drawing No RDSO/M-0001 (latest revision).
- (12) Design and execution of RUB/LHS work shall be done in close coordination and approval of Road authority.

- (13) Safe Bearing capacity of soil at founding level to be worked out by the contractor. In case required SBC is not available at founding level, necessary ground improvement with increased area shall be carried out as per approved scheme and to be reconfirmed through Plate Load Test.
- (14) Wing/return wall sizes, depth, and location shown in the drawings are tentative. The contractor has to design it on his own and approved by the authority. Fly wings are not allowed for return walls/retaining wall/any earth retaining structure.
- (15) Wherever the RUB/LHS is to be constructed at a shifted location without affecting existing road; the contractor shall plan work in such a way that RUB/LHS is commissioned and road traffic is diverted through LHS/ RUB before dismantling of diverted road.
- (16) Temporary diversion of road shall be within the scope of work, for which contractor may be required to arrange temporary land at his own cost.
- (17) All arrangements for drainage of RUB/LHS shall be done and it will be ensured by the contractor that there is no water stagnation in RUB/LHS in any weather.
- (18) Bridge tablets shall be erected on the bridge as per guidelines given in IRBM.
- (19) Restoration of sites including approach road cleaning after completion of the work shall be done by the contractor.

Break up of items for LHS/RUB covered under Sch G and G-1 are same as that of the bridges as per para of Bridges mentioned above .

Items not covered in bridges like Height gauge, Temporary diversion, roofing, speed breaker are covered under Sch G.

Excavation, concreting, and execution of U trough/retaining wall/wing wall, road works, drainage arrangement with all the shuttering, cement, steel are covered under Sch G-1

#### 4.26 Road over bridges (ROB)

Road over bridges (ROB) shall be provided at the following crossings as per GAD attached: **NIL**

### 5 Tunnel

#### 5.1 Following tunnels are within the scope of EPC contract.

S No	Tunnel No	Starting Chainage	End chainage	Length (m)	Tunneling Method
1.	T-8A	31600	32500	900	NATM
2.	T-9	34140	35610	1470	NATM
3.	T-9A	36290	36540	250	NATM
4.	T-10	36820	37220	400	NATM
5.	T-11	37380	38190	810	NATM
6.	T-12	38510	39790	1280	NATM
7.	T-12A	40540	40680	140	NATM
<b>Total Length</b>				<b>5250 m</b>	



The Start and End chainages of the tunnel i.e Portal given above are tentative. The Start and End chainages of the tunnel portals may be changed as per design subject to approval of the A.E.

- 5.2** The Authority has conducted its own preliminary survey for tunnels whose reports are attached for reference in Vol II of tender document. **Tentative Cross section for tunnel is attached. Finished tunnel dimensions to be strictly as per attached cross section.**
- 5.3** The contractor has to carry out its own survey including GT, geophysical survey etc to propose the Design and Drawings for execution of the tunnel.
- 5.6** Dewatering inside tunnel during execution is under scope of work
- 5.7** Any variation in overall length of tunnel shall be treated as Change of Scope and the rates for calculating change of scope for items in Sch G of BLT and excavation shall be on pro rata basis of accepted/awarded per running metre rate of this tender for BLT and excavation
- 5.8** Other permanent safety arrangements against the falling boulders, rain water, loose soil, slope stability in terms of rock bolting/shotcreting/wiremesh/geo-textile, concrete canvas, catchwater drains etc. shall be as per requirement and design proposed by contractor
- 5.9** Documents attached on IREPS portal are tentative and for reference only. Any deviation in actual site conditions including geotechnical strata shall not be treated as change of scope and any monetary claim by the contractor on account this shall not be entertained by the Authority. Bidders are advised to keep in mind this aspect during the bidding process.

**a) Key Considerations:**

1. Geological conditions (rock, soil, water table)
2. Tunnel alignment and gradient
3. Train speed and loading conditions
4. Safety features (Trolley refuge/man refuge, ventilation)
5. Maintenance accessibility.
6. Environmental impact.

**b) Design Parameters:**

1. Tunnel diameter - As per IRSOD (Upto latest revision & correction slips). Cross section attached
2. Tunnel shape- Horse shoe shape
3. Linings – RCC
4. Support systems -rockbolts, shotcrete, lattice girder, ISMB/ISMC, RCC as per the design approved by the authority.
5. Drainage and waterproofing -as per Site requirement and design approved by Authority
6. Ventilation and cooling systems - as per relevant Indian railway codes/manuals/guidelines and railway board's instructions and design approved by Authority
7. Fire resistance and safety measures - as per relevant Indian railway

codes/manuals/guidelines and railway board's instructions and design approved by Authority

**c) Design Codes and Standards:**

1. AREMA (American Railway Engineering and Maintenance-of-Way Association)
2. UIC (International Union of Railways)
3. ERTMS (European Railway Traffic Management System)
4. IRS (Indian Railway Standard)
5. ASCE (American Society of Civil Engineers)
6. AASHTO (American Association of State Highway and Transportation Officials)

The Indian Code & standard have to be followed (IRS/IRC/IS Code), if available before Resorting to international standard.

While designing the tunnel, best practices adopted worldover for railway tunnels shall be adopted in consideration with geotechnical data, environment conditions, loading standards, site conditions, IRSOD and requirements of electrical and S&T department of the authority.

**d) Following items are included but not limited to the scope of work are**

1. Design/drawing of bored tunnels and cut & cover including portals, Niches, Trolley refuses, drainage system, approaches etc
2. Minimum cross sectional area of Tunnels during design & construction shall not be less than the cross sections attached on IREPS portal. There should not be any violation of IRSOD for any items.
3. Safety/Trolley refuses inside shall be provided in accordance with IRSOD IRPWM (upto latest revision)
4. Slope in trolley refuses inside tunnels shall be away from track. However, Small drain of required size shall be provided by the contractor with downslope towards track and merge with longitudinal drain of tunnel.
5. Side drains in the tunnels shall be designed and constructed in such a way that water coming from side drains of the cutting area is not obstructed. All safety precautions during planning and construction stage shall be in accordance with RDSO guideline no. RDSO/2011/GE:G-0016.
6. All excavated material from cutting and tunnel is the property of the contractor. All usable earth/good-quality excavated muck generated from cutting and/or tunnel excavation may be utilized free of cost in any Railway work, subject to compliance with the relevant Railway codal provisions, specifications, and guidelines applicable to the intended use of such material.
7. All surplus, unused, or unserviceable spoil/excavated material shall be disposed of by the Contractor outside Railway land at his own cost and responsibility. No unused excavated material shall remain within Railway premises after completion of the work. The contractor can use designated dumping yards as shown in kml for dumping muck subject to compliance of all Forest conditions as mentioned in Stage I II and working permission. No additional cost for disposal or dumping in dumping yards will be given to the contractor.
8. No muck/spoil shall be dumped in any forest area, except at the designated dumping yards

approved/taken over by the Authority, which shall be used exclusively for disposal of excavated muck from cuttings and tunnels, strictly in accordance with the instructions of the Forest Department and all conditions stipulated in Stage-I, Stage-II Forest Clearances, and Working Permissions. The Contractor shall maintain continuous coordination with the Forest Department in this regard.

9. The Contractor shall be solely responsible for payment of all applicable royalty charges, levies, cess, or other statutory dues to the concerned Mining Department or any other competent authority, as per applicable State/Central Government Acts, Rules, and Regulations. The Contractor shall submit, along with each RA Bill, a self declaration certificate confirming that all applicable royalties and statutory dues for the executed earthwork have been duly paid as per the applicable laws/mining rules. Any liability arising out of non-payment or short payment of royalty or statutory dues shall be borne entirely by the Contractor. Further, upon completion of the work and before release of the Final Bill, the Contractor shall submit a final clearance certificate/NOC from the concerned Mining Department or other applicable Government authority confirming that all royalties, levies, and statutory dues pertaining to the project work have been fully paid and no outstanding liability exists.
10. During dumping/disposing of muck, contractor shall ensure that no Natural Nallah, Pond, Drainage, Canal, Road, Pedestrian, Animal Trails in the forest, Way etc. is blocked/obstructed. Dumping of muck in forest land is prohibited.
11. Proper drainage with no waterlogging at any location of the tunnel and its approaches shall be within the scope of this work.
12. The contractor should submit a Manual for Safety, Health, Environment and Disaster Management During Construction detailing the provisions made by the Contractor for ensuring health, safety and proper disaster management at a major construction site which is to be prepared and got approved by the Authority Engineer.
13. The cost of complying with all safety and security requirements, including all the connected costs of all labour and materials, shall be deemed to have been included in the scope of this work. Before starting any excavation work, the contractor shall ensure that necessary permissions have been obtained and required precautions have been taken for doing such work.
14. Contractor's as well as Sub Contractor's employees and representatives shall wear identification Badges (cards), uniforms, helmets, gum boots and other safety / protection gadgets / accessories provided by the Contractor. Badges shall identify the Contractor and show the employee's name and number and shall be worn at all times while at site.
15. Tunnelling being a hazardous operation, observance of safety precautions and compliance with the concerned safety codes and legal provisions are essential. The detailed provisions in this regard, quoting reference to the concerned Indian Standard Safety Codes, Codes of Practices and Acts of the Central Government, are contained in this section. The Contractor shall carry out the tunnelling operations with strict compliance to the provisions therein.
16. **The tunnel ventilation system is under the scope of this tender. The contractor will design and construct tunnels accordingly as per prevailing railway instructions and Railway Board guidelines. As per Indian Railway Construction Manual, "Normally on single line sections, tunnels having length upto 2 kms, may not require provision of artificial ventilation but it should be ensured that levels of concentration of pollutants during passage of trains are not likely to exceed threshold levels. Tunnels having length more than 2 kms may require provisions of artificial ventilation, by means of shaft with or without provision of fans, depending upon results of simulation studies" Thus contractor to install necessary sensors/instruments for monitoring of pollutants during and after tunnel execution. Same shall be handed over in working condition to Railway after commissioning.**
17. The various operations involved in tunnelling works, such as drilling, blasting, excavating,

support arrangement, transportation of muck, other movements of heavy construction machinery etc. could also cause heavy damage to the environment. The damage could be to air, sub-soil water, natural streams and to flora and fauna, due to causes such as production of dust, fumes, vapours, gases, fibres, and due to noise pollution. The provisions in this section for environment protection are especially applicable to tunneling works.

18. All conditions imposed by Forest Department and MoEFCC as per Stage I, II and working permission must be complied with which are attached as attachments and as mentioned in preceding Schedule titled Environment and Forest Clearances
19. Contractor may prepare temporary access roads wherever feasible within/outside ROW to access tunnel portals during construction subject to compliance of Forest restrictions as per permission given to Railways in Stage I II. The strengthening of existing roads for approach to work locations may be required to be done in isolated locations. However, no claim whatsoever shall be considered on account of strengthening of existing approach roads. Bidders have to conduct their own survey in this regard
20. Construction of access/approach roads shall be part of the scope of work. Authority has taken some approach roads inside Forest from tunnel to dumping area as attached and shown in kml. .Authority will pay for construction of these approach roads to tunnel, which will have to be maintained by contractor at his own cost throughout the construction period. On Completion of work, the contractor will hand over the road to Railways in good condition. Such construction of permanent road will be as per approval of Authority Engineer. At locations where approach roads are not available, contractor has to work with in ROW.
21. Necessary sensors shall be installed in the tunnels at suitable locations approved by the authority for monitoring concentration of harmful gases inside the tunnel during construction period.
22. Cement grouting of the tunnel shall be done to ensure that there is no pocket left behind. PU grout wherever required with approval of A.E. shall also be done to make the tunnel waterproof. Waterproofing membrane shall be provided behind the tunnel lining. The tunneling works shall be executed as per Handbook on Railway Tunnels published by IRICEN pune (attached on IREPS portal).
23. Side drains with precast RCC slab cover to be provided inside the tunnel such that precast RCC Cover will work as a walkway/pathway.
24. Catchwater drain wherever required as per design to be executed
25. Slope protection at approach & portal of tunnel to be designed by shotcreting/rockbolting/geogrid, geocell, geotextile, concrete canvas etc. or any other suitable method and approved by the authority.
26. Track structure inside the tunnel including its transition system shall be designed and constructed as “Ballastless Track” (BLT) irrespective of length on safety, maintenance and life cycle cost consideration as per railway board’s letter **No. 2024/TK-II/22/26/1/BLT dtd 10.05.2025**. BLT with all fittings, fixtures, fasteners, rubber pads etc as per IRS specifications shall be within the scope work. The Fixing of secondary/new rails (main rails, guard rails/check rails etc.) including local leading, handling, all leads & lifts shall be within the scope of this contract under Sch-G. Leading/lifting/fixing of rails inside tunnel from tunnel portal is with in scope of contract and deemed to be included in Schedule G BLT works.
27. Rail painting for rails inside tunnel shall be as per RDSO/RB guidelines and same shall be got approved from A.E..
28. Specialised BLT agency to be engaged as per RDSO letter 2024/TK-II/22/26/1/BLT dtd 10.05.2025
29. Increase/Decrease in length of BLT if any shall be treated as Change of Scope as per Increase/Decrease in tunnel length. The rates for calculating change of scope for items in Sch G of BLT shall be on pro rata basis of accepted/awarded per running metre rate of this tender for BLT.

30. The contractor will supply to the Authority 5% extra fittings than the actual quantity used in construction of BLT for maintenance works. The rates of these extra fittings are deemed to be included in the schedule G.
31. Specifications, definitions and payment conditions for tunneling items under Sch G-1 is elaborated in Tunnel reports attached with this tender and under Sch-D
32. Shuttering for final inner lining to be compulsorily Movable Shutter with hydraulic moving and adjustment facilities
33. No additional payment of dewatering will be given during tunnel execution.

**5.10 Scope of work covered under the schedule G (under EPC mode) shall be as follows:**

1. All underground excavation work for tunnel, niches, refuges by approved methodology based on NATM principles.
2. All design and drawing of tunnel, portal area, BLT work, all types of survey including GT, geophysical required for design of tunnels
3. **All types of dewatering** during complete tunnel execution work.
4. Ballastless track work including its transition system with all its fittings/fixtures complete
5. Leading of main line rails from tunnel portals, painting and welding of rails inside tunnel and all other associated P way work.( Main line rails/Secondary rails/guard rails will be given by Railway free of cost)
6. Extra 5 % Fittings supply for BLT
7. Any access prepared by contractor for its own working upto tunnel portals except those acquired by Railway from Forest which are shown in kml.
8. Preparation of all types of plans including Environmental Management Plan
9. Any other item not covered under Sch G-1

**5.11 Scope of work covered under the schedule G-1 shall be as follows:**

1. Development of approach road to tunnels which are acquired by Railway from Forest and shown in kml attached with this tender. Payment will be made once for construction of road and contractor has to hand over the road in good working condition.
2. Slope protection like shotcreting/ rock bolting / geogrid, geocell, geotextile, concrete canvas etc. at tunnel portal i.e. portal development as per approved drawing, safety arrangement against falling of boulders at tunnel portals
3. Primary lining supports like shotcrete, rock bolting, lattice girders, ISMC/ISMB, forepoling, pipe roofing, wire mesh, steel fibre, grouting,
4. Waterproofing works of tunnel, cement / PU grouting
5. RCC lining of underground tunnel and cut & cover, drainage arrangements, cable ducts
6. Portal face wall, retaining wall
7. Filling over cut & covers
8. Electronic/ mechanical sensors required for measurement of pollutants during and post construction
9. Complete execution of Catch water drains at toe of cutting at approach of tunnel/ above tunnel portals
10. Transportation of rails upto tunnel portal if required like secondary rails, guard rails as per instruction of A.E. will be payable under relevant item.

**5.12 Tunnel Specifications and conditions**

Detailed Specification of Tunnels are covered under “Tender Document Vol II Tunnel specifications & Preliminary report” and work to be done accordingly.

## **6. Track**

- i. The track layout shall be based on the provision contained in the Indian Railways Permanent Way Manual 2024 with latest amendment and correction slips, 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 guide lines and codes & manuals specified in schedule D.
- ii. The final designs of the track layouts, including horizontal and vertical alignment, station yard layouts,
- iii. LWR plans etc shall be proposed by the contractor and approved by Authority in accordance with the provisions of the Agreement. LWR to be made through over bridges by conducting RSI analysis and designing structure accordingly.
- iv. 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 loop line the track structure consists of 60Kg new rail on 60Kg PSC sleepers (wider base) of 1660 per Km density with 300mm ballast cushion.
- v. The Curve should be laid with transitions designed for speed potential of 130 Kmph and super elevation should be provided as per sectional speed. During earthwork only the super elevation should be provided to blanket layer/sub grade for curve portion.
- vi. Thick web switches (straight/ pre curved as applicable) and CMS crossing 60 kg should be provided on main line, loop line, all siding as per direction of the Authority Engineer
- vii. Design, Manufacture / Procure / Supply and Construction / Laying 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 etc. and all other related works as necessary for the following :
- viii. Main Line & Connecting Line electrified track capable of operating at a maximum train speed of 160 km/h
- ix. 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 etc. electrified track capable of operating at a maximum train speed of 30km/h.

### **6.1 Alignment of Trackways**

- i. The indicative Alignment and Yard layout for each Station as developed by the Authority is enclosed in the Alignment Drawings as part of the Reference Drawings. The Authority has acquired the adequate Right of Way (ROW) for the same
- ii. 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.

- iii. 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
- iv. Engineer with supporting documents including data, calculations, maps and drawings etc.
- v. Work in the yard to be done as per ESP attached with the tender. ESPs are tentative which must be revalidated and approved from Authority. Entire yard works are in scope of the work of contract. Central drains in between main line and loop lines are to be provided. Drain to be provided with cover

## **6.2 Supply of 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. Ballast cushion of 350 mm on Main Line and 300 mm on loop lines to be provided. Supply to be taken accordingly.

## **6.3 Spreading of ccess Ballast**

- i. 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 250/300 mm or up to the pre-determined marks on reference posts, so that after rolling at least 200 to 250 mm thick ballast bed is available for P.Way linking.
- ii. Ballast shall spread uniformly ensuring that no muck from the ballast tracks 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 etc. 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.
- iii. 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.
- iv. 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 etc.

## **6.4 Materials for linking of Track**

- i. Rails for main line, loop line, guard rails, secondary rails for linking shall be issued to Contractor or his nominated representative free of cost. 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. Transportation of rails (second hand, Guard rails, 13 m new rails) from within Ratlam or near by Divisions required as per instruction of Authority Engineer to be done and will be payable as per relevant item. 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. Railway board guidelines to be followed for procurement of materials. Vendors for P.way material to be finalised in consultation with Authority Engineer. Material will be procured from

RDSO approved vendors only. Railway Board guidelines issued vide letter No. CT/EF/TSC dtd 29.01.26, No. CT/FD/2/Nil dtd 02.12.25, No. 2026/TK-II/22/7/1(E-3523503) dtd 17.03.26 to be followed. Procurement of Sleeper, ERC, pads to be as per letter mentioned above. Inspection to be done by the Non TPI wing of RITES as per letter mentioned for Sleeper, ERC, rubber pads. HVN liner to be used as per letter CT/EF/TSC dtd 29.01.26. 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. Service rails & SH rail in 6 m to 13 m length up to the extent required shall be issued to the contractor for temporary use progressively. After linking of track over service rail, new rail (**free rail for P&C linkage, 260m panel for Main line and loop line**) will be arranged by the Authority. These will be welded using a mobile Flash butt welding plant by the Contractor. The unloading of rails is to be done by the Contractor in case rail supply is available through railway wagons. 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 etc. Track shall be laid as per specifications and guidelines provided in IRPWM and LWR manual with latest correction slip. 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.

- 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 inserted.
- iv. ERC applicator to be used for driving ERCs
- v. After linking of track over service rail, new rail (free rail for P&C linkage, 260m panel for Main line and loop line) will be arranged by the authority.
- 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 if any.
- 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 etc
- xii. Fabrication and installation of Glued Joints as per relevant railway guidelines All glued joints fabrication including all material, manpower consumable are covered under scope of Sch-G. No change of scope is admissible in Glued Joints. Contractor to make its own assessment

### **6.5 Ballasting and Initial Packing**

- i. Ballast should be first spread over the formation as per required thickness approved by 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.
- Viii After completion of tamping, ballast cushion to be 350 mm on Main line and 300 mm on loop lines.

### **6.6 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. The 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 Pre, During & Post Tamping operations shall be carried as per IR Track Machine Manual (Para 3.12, 3.13 & 3.14) HSD, consumable etc shall be supplied by EPC contractor.
- Vi. Anti – corrosive painting of Rail 60 KG outside track on rail bottom, web, foot and fishing plane as per IRPWM para 613 (2) ((b))

## 6.7 Specification of finished Work

The tolerances of finished work to be as per IRPWM Chapter-5

## 6.8 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 Railway’s 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.

- i. Rails are to be welded as per the provision of Indian Railway’s 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 For mobile flash butt welding, contractor has to deploy the mobile flash butt welding machine and QAP of this machine should be duly approved by RDSO/as per prevailing railway instruction. QAP for welding for every site has to be prepared and got approved by the Authority Engineer
- ii. 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.
- iii. The contractor shall be responsible for removal of all kinks and twists in the rails, particularly within 1.8m from either end. Once the rails to be welded have been aligned, levelled, 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.
- iv. Maximum percentage of defective welds during initial weld testing should not exceed 2%. In addition to free replacement of defective weld, a penalty of Rs10, 000/- be also imposed for each defective weld beyond 2%. The defective percentage be calculated for a group of 500 welds or part thereof.
- v. 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 etc. at his own Cost A finished joint will be accepted as good on considerations of dimensional accuracy, if it satisfied the following tolerances:

- a. Vertical alignment : Variation not more than +1.0mm, -0.0mm measured at the end of one metre straight edge.
- b. Lateral alignment : Variation not more than +0.5mm measured at centre of one metre straight edge.
- c. Finishing of top surface : +0.4 mm, -0.0mm measured at the end of 10cm straight edge.
- d. 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 only applicable in case of new rails, but in case of existing rails where there is depression of more than 1 mm measured with 1meter long straight edge placed centrally on the rail head before welding the tolerances would be decided at site between contractor and Authority's Engineer. In **case** of in-situ welding, the rail fastening for at least 5 sleepers on either side of the proposed weld shall be loosened.

## 6.9 Greasing Rails, ERC & M.S. Liners.

No ERC & M.S. Liners are to 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.

## 6.10 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:-
- i. Ballasting where there is shortage of ballast.
  - ii. Heaping up of ballast in the tamping zone, to ensure effective packing.
  - iii. Making up for low cess.
  - iv. Cleaning of pumping joints and providing additional clean ballast, where necessary.
  - v. Attending to Hogged joints before tamping.
  - vi. Tightening of all fittings and fastenings like fish bolts and keys, splitting of cotters, and replacement of worn-out fittings.
  - vii. Renewing broken and damaged sleepers.
  - viii. Squaring of sleepers and spacing adjustment; re-gauging to be done as necessary.
  - ix. Adjusting creep and expansion gap in rails.
  - x. Examination of rails for cracks etc.
  - xi. Realigning of curves which are badly out of alignment.
  - xii. Clearing of ballast on sleepers to make them visible to the operator.
  - xiii. All obstructions such as signal rods, cables, pipes, level crossing check rails, etc., 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. Super elevation should be marked on every second sleeper so that it

can guide the operator for levelling up correctly.

**(B) Post Tamping Attention** – The contractor shall pay attention to the following points:

1. As some of the rigid fastenings might get loose, tightening of fittings should be done immediately after tamping.
2. Any broken fitting should be replaced.
3. 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.
4. The ballast should be dressed neatly and proper consolidation of ballast between the sleepers should be done

## 6.11 Laying of LWR

The Contractor should prepare the LWR plan and get the approval of Authority's Engineer and Authority.

### a) Destressing

Destruction 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, an abrasive rail cutting machine shall be used. The joints in LWR shall be welded immediately after distressing.

### b) 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, de-stressing of the welded panel shall be carried out as per the laid down guidelines. Before laying SEJs, they should be completely oiled and greased.

## 6.12 Procurement, fabrication & manufacturer of P. Way material and fittings

The P.Way material & fittings shall be procured from RDSO approved firms only and testing, checks and approval as prescribed by RDSO/ Railways and illustrated vide preceding para titled "Materials for linking of track".

An indicative list of materials for track linking with their drawing number has been mentioned below. Same shall be assessed as per IRPWM and actual requirement, which shall be approved by Authority Engineer. Change in quantum or addition of any material required for track linking shall not constitute change of scope. All these items are included in Schedule G.

SR NO	DRAWING NUMBER	ITEM	Total	Unit
1	T-8746	WIDER SLEEPER	13,950	NOS
2	T-8970	BRIDGE SLEEPER	5,857	NOS
3	T-8971 TO 8978	BRIDGE APPROACH SLEEPER	37	SET

4	T-8747	10MM CGRSP	52,523	NOS
5	T-8748	MS LINER FOR WIDER SLEEPER	30,996	NOS
6	T-5919	MK V ERC	90,678	NOS
7	T-8258	ERC J CLIP	716	NOS
8	T-5849	JOGGLE F/PLATES WITH CLAMPS	36	SET
9	T-5916	1M LONG F/PLATES 60KG	1,619	NOS
10	T-1899	FISH BOLTS (25X140)MM	4,856	NOS
11	T-6154	PSC SLEEPER FOR 1:12 TURNOUT	4	SET
12	T-7075	PSC SLEEPER FOR 1:16 TURNOUT	12	SET
13	T-6154	GRSP FOR 1:12 TURNOUT	4	SET
14	T-5691	GRSP FOR 1:16 TURNOUT	12	SET
15	T-6155	THICK WEB SWITCH 1:12 LHS 60 KG	2	SET
16	T-6155	THICK WEB SWITCH 1:12 RHS 60 KG	2	SET
17	T-7076	THICK WEB SWITCH 1:16 LHS 60 KG CURVED	6	SET
18	T-7076	THICK WEB SWITCH 1:16 RHS 60 KG CURVED	6	SET
19	T-4220	CMS CROSSING 1:12	4	SET
20	T-5693	CMS CROSSING 1:16	12	SET
21	T-8751	HVN-66 INSULATING	59,143	NOS

		LINER FOR WIDER SLEEPER		
22	T-4149	SPECIAL SLEEPER FOR SEJ	168	NOS
23	T-4159	GRSP FOR SEJ	336	NOS
24	T-6902	ISEJ 80MM MAX GAP	24	SET
25	T-8924	CURVED ISEJ 80MM MAX GAP	-	SET
26	T-4153	RAIL SCREW FOR GUARD RAIL	24,615	NOS
27	T-3912	PLATE SCREW FOR P&C	3,496	NOS
28	T-3915	PLATE SCREW FOR SEJ	2,016	NOS
29	T-5856	SCREW CLAMPS FOR JOGGLE FISH PLATE	72	NOS
30	T-10773	SPRING WASHER	35,064	NOS
31	T-696 TO T699	COMBINATION FISH PLATE 52/60KG	4	SET
32	T1900/1901	COMBINATION FISH PLATE 90R/52KG	2	SET

*This list is an indicative and complete assessment of the material to be done by the contractor. All material as defined in scope of work is included in Sch-G No additional cost of p.way material will be given.*

### 6.13 Pway Material inventory and MMU Mobile Maintenance Unit supply

The following P-way material inventory shall be supplied by the Contractor at the time of commissioning:

Sr. No	Particulars	Quantity	Unit	Location of Supply
1.	Fish plate 60 kg 1.00-meter-long t-5916	96	Nos.	SSE-Pway-DADN at DADN Store
2.	Joggled Fish plate 60 kg clamp with fitting T-5856	96	Set	SSE-Pway-DADN at DADN Store
3	Joggle F/plate& bolt 60 KG T-5849 (1 set=2 Nos. with bolt)	96	Set	SSE-Pway-DADN at DADN Store
4	Fish bolt 60 kg T-1899	380	Set	SSE-Pway-DADN at DADN Store
5	Glued joint 60 kg 6.5 m long (6mm insulation)fabrication	6	Nos.	SSE-Pway-DADN at DADN Store
6	ISEJ 60KG t-6902 with Latest Alt.	2	Set	SSE-Pway-DADN at DADN Store
7	Grooved rubber pad 10mm thick T-8547	300	Nos.	SSE-Pway-DADN at DADN Store
8	GFN Liner T-8751	480	Nos.	SSE-Pway-DADN at DADN Store
9	Metal liner T-8748	960	Nos.	SSE-Pway-DADN at DADN Store

10	ERC clips T-5919	2000	Nos.	SSE-Pway-DADN at DADN Store
11	ERC "J"clips T-8258	120	Nos.	SSE-Pway-DADN at DADN Store
12	<b>Retro reflective speed boards ( 20,30,45,75 kmph )</b>			
(a)	Caution Indicator Board	7	Nos.	SSE-Pway-DADN at DADN Store
(b)	Speed Indicator Board ( 20, 30,45,75 kmph. )=12x4=48	7	Nos.	SSE-Pway-DADN at DADN Store
(c )	Termination Indicator Board =12x4=48	14	Nos.	SSE-Pway-DADN at DADN Store
13	Point clamp for thick web switch for rail 60 KG, Specification no. T-5149	20	Nos.	SSE-Pway-DADN at DADN Store

(b) The following Mobile Maintenance units (MMU) shall be supplied by the contractor.

Sr. No.	Description	Quantity	Unit	Location of Supply
1	Abrasive Rail Cutter as per RDSO Specification No. TM/SM/1 dt. 24.04.1991 latest (Rev.01 of 2012)	2	Each	SSE-Pway-DADN at DADN Store
2	Rail Drilling Machine complete fitted with petrol start kerosene run engine of 2/3 HP ISI mark with mono rail wheel arrangement as per RDSO Specification No. TM/SM/3 dt. 24.04.1991	2	Each	SSE-Pway-DADN at DADN Store
3	Chamfering Tool kit set complete as per RDSO Specification No. TM-53 dt. 18.04.2004 as per latest Drg no. TM/0512	2	Each	SSE-Pway-DADN at DADN Store



4	Push trolley (BG) Light weight complete with Chair, tool box & Umbrella as per RDSO  Specification with efficient insulated arrangement.	2	Each	SSE-Pway-DADN  at DADN Store
5	Self-propelled light weight motor trolley (BG) as per RDSO Specification No. TM/SM/28	1	Each	SSE-Pway-DADN  at DADN Store
6	MSP Insulated Gauge-cum- with sprit level (BG ) as per RDSO specification no. TM-58 & TM-52 for BOX Sprit level.	5	Set	SSE-Pway-DADN  at DADN Store
7	Hydraulic Rail Bender ( jim crew, heavy duty ) with bending force capacity 60 tonnes and max.  piston stroke not less than 40 mm.	2	Each	SSE-Pway-DADN  at DADN Store
8	Portable DC Welding Generator as per RDSO Specification No. TM/SM/20 dt. 19.11.1992  (Auxiliary output 2500 watt & Range of welding current 60 to 200 amp	2	Each	SSE-Pway-DADN  at DADN Store
9	Double action weld trimmer for AT Welding (power pack version) Completes Per RDSO Specification No. TM/SM/9 dated 16.08.1991  A. ( it includes minimum shearing force 18 tonnes capacity & min. 3 HP engine).	2	Each	SSE-Pway-DADN  at DADN Store
10	Mechanical track Jack 15 TON capacity (non-infringing type)	5	Each	SSE-Pway-DADN  at DADN Store
11	Magnetic Base Type Rail Thermometer as per specification No. TM/SM/67 dt. 28.01.2002 ( Rev.01 of 2010)	10	Each	SSE-Pway-DADN  at DADN Store
12	DC Lighting Generator with stand, lamp etc. complete	2	Set	SSE-Pway-DADN  at DADN Store

13	Rail welding equipment 60/52 KG (BG ) complete sets	2	Set	SSE-Pway-DADN at DADN Store
14	Rails Profile Weld Grinder as per RDSO Specification No. TM/SM/10 dt. 16.08.1991	2	Set	SSE-Pway-DADN at DADN Store
15	Rail Dolly (BG )as per RDSO latest drg. no. EDO-1874	10	Each	SSE-Pway-DADN at DADN Store
16	600 Rollers, 8 Wooden mallets(complete set for distressing 3 km. LWR)	3	Set	SSE-Pway-DADN at DADN Store
17	Dip Lorries (BG ) as per RDSO Drg No. MA-3041 15 Ton Capacity	2	Set	SSE-Pway-DADN at DADN Store
18	Universal point Screw clamp as per RDSO NO. T-3521 for Rail 60/52 Kg	10	Each	SSE-Pway-DADN at DADN Store
19	Electronic Toe load measuring device (Mechanical)	2	Each	SSE-Pway-DADN at DADN Store
20	Hand hold off track tamper	2	Nos	SSE-Pway-DADN at DADN Store
21	Crow bar steel	30	Nos	SSE-Pway-DADN at DADN Store
22	Phawrah Steel	50	Nos	SSE-Pway-DADN at DADN Store
23	Ballast Rakes (8 prong ) Forks	50	Nos	SSE-Pway-DADN at DADN Store
24	Hammer for key man 3.5 kg	10	Nos	SSE-Pway-DADN at DADN Store
25	Red Banner Flag BG	15	Nos	SSE-Pway-DADN at DADN Store
26	Red Hand signal Flag Size 45.7X45.7 M	20	Nos	SSE-Pway-DADN at DADN Store
27	Green Hand signal Flag Size 45.7X45.7 M	10	Nos	SSE-Pway-DADN

				at DADN Store
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#### 6.14 Railway Level Crossings

The railway level crossings shall be provided at following locations: NIL

#### 6.15 Track layouts in station yards

Station yards shall be constructed as per the final engineering scale plans 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 modification the same in conformity with Design criteria, specifications, standards & best practices duly approved by Authority's Engineer and Authority.

S. No.	Yard	C/L chainage	Number of Lines
1	Kulthana	26/600m	3
2	Rajpura	41/320 m	3

1. The marking of the bridges in the yards, if any, on the plan and profile sheets indicates only the locations. If the bridge is not shown in ESP, then the details of the bridges shown in L-section shall be constructed.

#### 6.16 Scope of work covered under the schedule G (under EPC mode) shall be as follows:

- (i) Linking of track on main line, loop lines/sidings with contractors materials & fittings as per IRPWM in station yards (Kulthana and Rajpura ), in block section Kulthana-Rajpura including in tunnels and bridges all complete
- (ii) Supply and spreading of track ballast
- (iii) Supply of all types of sleepers i.e. wider PSC sleepers, turnout PSC sleepers, special PSC sleepers for SEJ, fabrication and erection of guard rails on bridges, bridge approaches, level crossings, H-beam sleepers if required.
- (iv) Supply of points (thick web switches) & CMS crossings with all matching fastening components, thick web SEJs, check rails, fish plates (1metre long), fish bolts, Grooved Rubber Sole Plate, metal, GFN & HVN liner, ERC (MK-V), J-clip, glued joints, Joggle fish plates with bolts, combination fish plates etc., including new rails required for manufacturing of these materials/fittings.
- (v) Welding by mobile flash butt welding and SKV welding etc.
- (vi) Packing of track, points & crossings, consolidation of track etc. with track machines provided by Railway on hire basis. Cost of pre-tamping & post tamping and consumables for operating machines to be borne by the contractor.
- (vii) Supply of P-way materials as maintenance inventory as per list & quantities given in the tender document
- (viii) Supply of equipments, tools & plants for Mobile Maintenance Units (MMUs) as per list and quantities given in the tender document
- (ix) Unloading of Long Rail panels from EUR
- (x) Painting of Rails as per IRPWM and railway guidelines.

**Note: New rails 260m/130m rails and single rails for main line, loop lines, siding line linking will supplied by Railway free of cost. Secondary rails for use as guard rails and service rails**

**for initial track linking will also be issued free of cost by Railway.**

**6.16 Scope of work covered under the schedule G-1 (under BOQ basis) shall be as follows:**

- (i) Transportation of second-hand rails and other Pway material as per requirement from any location of Ratlam division or any other division of Western Railway.

**Note: Hire charges for trach machines shall be deductible as per Sch-P**

**7. Building Works under EPC mode**

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, Western Railway Chief Engineer Circular no. 629 (10/W/Policy/Building) dated 13- 07- 2016 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 levelling and other works incidental to buildings. Building works shall be deemed to include structures at Level Crossings for interlocking purposes, 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.

**\*\* Note :-** Platform walls, foot over bridge (FOB), surfacing of platform, FOB, covering shed, circulating area, approach roads , water supply and drainage arrangements etc. shall be carried out as per the scope defined below and as per ESP 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).

Station should be fully compliant with Divyangjan Guidelines Notification issued by Railway Board vide RB letter No.2019/Stn.Dev.-I/03/06/Policy(PwDs) dtd 28.11.2023 Signages at stations to be provided as per RB letter No. 2023/SD-II/22/07/02 dtd 15.05.2023

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 modification the same in conformity with Design criteria, specifications , standards & best practices duly approved by authority's engineer and authority.

**7.1 Railway stations**

Railway stations shall be constructed at the following locations:

S. No.	Station Code	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)	(7)
I.	-	Kulthana	29.600	2 nos. H/L Pass.	11 m	1 number, 3.66 m wide

				PF/ 650m each		with ramp
II.	-	Rajpura	41.320	2 nos. H/L Pass. PF/ 650m each	11 m	1 number, 3.66 m wide with ramp

Station name	Nos. of stairs on each platform	No. of Ramp on each platform	PF Shelter (Nos.)*L*B	Circulating area (Sq. Metre)	Approach Roads at Station	Boundary wall m
(8)	(9)	(10)	(11)	(14)	(15)	
Kulthana	1	1	<p>PF-1 550 (50 m*11 m) sqm COP Mini shed- 2no. on each, platform 20 sqm each</p> <p>PF-2 550 sqm (50 m*11 m COP</p> <p>Mini shed- 2no. on each platform, 20 sqm each</p> <p>All platforms wall to be precast segments</p>	600	1200 m	600 m  (1.8 m high above ground)
Rajpura	1	1	<p>PF-1 550 (50 m*11 m) sqm COP</p> <p>Mini shed- 2no. on each, platform 20 sqm each</p> <p>PF-2 550 sqm (50 m*11 m COP</p> <p>Mini shed- 2no. on each platform, 20 sqm each</p> <p>All platform wall to be precast segments</p>	600	1200 m	600 m  (1.8 m high above ground)

Pathway at end of platforms connecting both platforms to be provided at either end of platforms as shown in ESP. MS Platform fencing to be provided on non track side all along on both the platforms which should duly be designed with intermediate RCC/steel columns with RCC footing and RCC beam all along the length of platform RCC.

**Retaining wall as back wall** to be provided in the station building portion i.e along the platform of length equal to station building. This station building frame may be designed in conjunction with this RCC wall, Water fountain to be provided as per ESP, Cable duct with cover to be provided all along the platform on both platforms at both stations.

**Note :** All passenger amenities must be compliant as per the Railway Board letter No. 2018/LM(PA)/03/06 dated 09/04/2018 (with latest amendments)

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 modification the same in conformity with Design criteria, specifications, standards & best practices duly approved by authority's engineer and authority.

600 Running metre boundary wall to be provided at each station building

Platforms walls to be casted in the form of pre cast RCC segments and then erected at site. Cast in situ platform wall will not be allowed.

**All the works as mentioned above including design and drawing are included in lump sum i.e Schedule G**

## 7.2 Service buildings

Service buildings shall be constructed at each station as per PCE type plan issued vide letter WR-HQ0ENGG(WPSB)/2/2019-3193 with below areas

Sr. No.	Station/ Location	Service building	Total Area (Sqm)	Remarks
1	<b>Kulthana</b>	Station Building Area 600 sqm	600 sqm	
		Cable hut 2 number	2*25= 50.00	
		Gang Tools Cum Rest Room	50	
		Water Tank	1.25 lakh litre	
		U/G RCC Sump for water tank	1.25 lakh litre	
		SP (Land area : 20.5 m by 6 m) Control building (6 m by 4 m)		SSP to be designed with RCC retaining wall all around land area

2	<b>Rajpura</b>	Station Building Area 600 sqm	600 sqm	
		Cable hut 2 number	2*25= 50.00	
		Gang Tools Cum Rest Room	50	
		Water Tank	1.25 lakh litre	
		U/G RCC Sump for water tank	1.25 lakh litre	
		SSP (Land area : 18 m by 6 m) Control building (6 m by 4 m)		SSP to be designed with RCC retaining wall all around land area

**All the works mentioned above are included in lump sum i.e Schedule G**

Architecture and profile of buildings shall conform to local aesthetic, cultural ethos, etc. and it shall be approved by Authority Engineer. Architectural plan and elevation shall be prepared by the contractor shall get it approved by the authority. Buildings' architecture and profiles should adhere to regional, religious aesthetic standards, cultural norms, etc. The 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. The foundations of buildings shall be designed for at least one storey more than the requirement.

The contractor shall also develop the architectural plan and Elevation, detailed design and drawings[1] and for construction Gang Rest Rooms fully electrified and with proper toilet, water supply, sewerage, drainage facility, leakage proof roof, rain water harvesting etc. in conformity with Design criteria, specifications, standards & best practices duly approved by authority's engineer and authority

Construction of Service building should be as per following details.

Sr. No.	Description	Specification	Skirting/Dado
1.	All rooms	Flooring with vitrified tiles.	Same with 150 mm high
2.	Verandah	Flooring with Kota Stone.	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

6.	Porch	Paver blocks/Chequered tiles
7.	Internal finish	All walls finish in POP followed by acrylic/oil bound emulsion paints of brand Asian, Nerolac, Berger or similar make as per recommended make issued by HQ WR as per Schedule D
8.	Railing	Stainless steel railing
9.	Door/Window ventilator	For Doors and Window ventilators, aluminium frames & shutter with glass[2] 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
11.	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
12.	Window shutter	Aluminium shutter frame with glass panel.
13.	Grill	Iron
14.	External finish	Texture finish from Asian paints, Berger, Nerolac or similar
15.	Terrace finishing	Brick bat Koba with Cement slurry mixed with tapecrete acrylic based polymer water proofing compound (having solid content 30%±2, PH>7) in a ratio of 2:1 (2 cement:1 water proofing compound) followed by laying of fibre glass cloth; 2 <sup>nd</sup> coat of cement slurry mixed with acrylic based polymer water proofing 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

**\*\*Note :-** All Service Buildings should be constructed as per the details provided above 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 modification the same in conformity with Design criteria, specifications, standards & best practices duly approved by authority's engineer and authority.

All items of building works shall conform to latest CPWD specifications of works. The building work shall include construction of buildings as per approved plan including electrical internal conduiting with allied works such as fan boxes, switch boxes etc, sanitary fittings, sewerage system, water supply arrangement (bore wells, pump house, water tanks) and internal water supply/sanitary fittings, approach roads, boundary wall, fencing, site levelling, landscape elements, water harvesting and other works incidental to buildings. Building works shall be deemed to include railway station building, service buildings, buildings required for installation of equipment for electrification works, and other facilities along the railway line.

1. Suitable layout plan duly indicating all the above items shall be developed by Contractor in consultation with the Authority's Engineer for Rajpura station and submit the same for approval. The scale of facilities and its design wherever applicable and have not been explicitly specified, shall confirm to latest National Building Code provisions or IR Works manual. The indicative list of building work includes station building including panel room and toilet blocks as per the typical layout



plan and S&T service building consisting of station facilities. The work also includes circulating areas, High level platforms, Subway/FOB etc. The list is indicative and the scope shall include the new structures as detailed above.

2. Rainwater harvesting is to be planned on the rooftop of service buildings (such buildings as having plinth area above 10 Sqm) to be constructed by Agency as well as surface runoff generated in circulating areas at KULTHANA & RAJPURA yard to be constructed by Agency.
3. The contractor shall provide all necessary furniture in the ASM panel room, waiting room, rest room, SM office and other offices as given in Railway Board's letter No. 2024/I & Trans. Cell/SOCC, dated 21.06.2024, as approved by the authority. The furniture shall be of approved make as per A.E.
4. Specifications of any material used shall be as per schedule D.
5. Buildings shall be designed on green building concept.
6. In buildings, flush doors with mosquito proof jali shutter on all outer doors and UPVC windows with triple channel shall be used. SS grips shall also be provided on all windows. Panel room shall be constructed as per approved plan.
7. Specifications and brands of all water supply, fittings, sanitary ware to be as per schedule D. PVC/UPVC Water tanks of designed capacity on station building shall be provided.
8. Water supply system and sewerage system for station building and station public toilets shall be designed and constructed under this EPC contract.
9. The requirements for fitments for drinking water, drainage and sanitation in the case of buildings other than residences shall be in accordance with **Table 2.1 and Table 2.2** of IRWM for office buildings and factories respectively.
10. Types of flooring, wall surface and Colour of wood and steel work, in general, shall be in accordance with IRWM and/or approved by the authority.
11. All types of buildings shall be designed as earthquake resistant buildings.
12. Station name boards (primary, secondary, tertiary) as per IRWM (Latest) shall be provided under EPC mode.
13. Suitably designed ducts shall be provided on platforms and yards for electrical and S&T cables.
14. Platform walls and platform coping to be precast
15. Surfacing of platforms shall be RCC concrete flooring in open area and kota stone under COP.
16. Protective screens will be required to be provided on all new FOBs (to be constructed by EPC Agency) in full stretch over railway tracks as per extant rules/railway guidelines.

### 7.3 Staff quarters -

2 Type III quarters at Kulthana and 2 Type III quarters at Rajpura to be constructed as approved plan attached. Quarter at Kulthana to be completed in 7 months from Appointed Date and quarter at Rajpura to be completed within 12 months from Appointed Date. Failure to complete as per the mentioned time line, a penalty of 20,000 INR per week for each location will be imposed. Approx plinth Area of 2 quarters (at Ground floor) as indicated in **attached drawing** is 10.2 metre by 21 metre. Total area including circulating space for 2 quarters at ground floor is 27.7 m by 16.6 m. The quarter must be

completed with all associated facilities of water supply, sanitation, approach roads, boundary wall, electrification. This staff quarter will be used to accommodate Authority Engineers representative during project execution. Supply of beds, mattresses, table chair inside quarter to be done as per approval of Authority Engineer.

**All the works as mentioned above are included in lump sum i.e Schedule-G**

#### **7.4 Water supply and distribution**

The Contractor shall provide an adequate supply of water at platforms, station buildings, offices, and staff quarters etc.

**Note :-** Water pipe line of required diameter & length should be provided to the Proposed H/L Platform, Proposed Station, S&T building & Cabin, tool room from RCC overhead Water tank constructed at each station as directed by Authority Engineer. Bore of adequate capacity to be done to supply water to underground Sump/RCC Overhead Tank.

**All the works as mentioned above are included in lump sum i.e Schedule-G**

#### **7.5 Drainage system**

Efficient drainage system for disposal of water from the buildings and for drainage of the area shall be provided as approved by the Authority engineer.

**All the works as mentioned above are included in lump sum i.e Schedule-G**

#### **7.6 Sewerage System**

Efficient Sewerage system shall be provided as approved by the Authority engineer whose cost is deemed to be included in **Schedule G**

#### **7.7 Pedestrian Bridges**

02 Nos. Foot over bridges with ramp on each platform for pedestrians crossing railway track/station shall be constructed at as follows which is included in **Schedule-G**

<b>S. No.</b>	<b>Station/ Block Section</b>	<b>Length (approx.)</b>	<b>Width</b>	<b>No. of staircase</b>	<b>No. of ramps</b>
<b>1</b>	<b>MKT</b>	<b>1 X 30 m</b>	<b>3.66 m</b>	<b>2</b>	<b>2</b>
<b>2</b>	<b>BWW</b>	<b>1 X 30 m</b>	<b>3.66 m</b>	<b>2</b>	<b>2</b>

Note: The details provided above 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 modification the same in conformity with Design criteria, specifications, standards & best practices duly approved by authority's engineer and authority.

#### **7.8 Service roads/ internal roads/approach roads and footpaths**

Service roads/approach roads and footpaths shall be constructed at the locations and for the lengths and

widths as per Approved ESPs and as per table above. 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 modification the same in conformity with Design criteria, specifications, standards & best practices duly approved by authority's engineer and authority.

**All the works as mentioned above are included in lump sum i.e Schedule G.**

## **7.9 Boundary walls, boundary pillars, Fencing**

Railway Boundary Pillars have to be erected as per the provision of the Indian Railway Works manual and Indian Railway Construction manual. Boundary pillars to be erected as per drawing approved by Authority Engineer.

**All the works as mentioned in para 7.1 7.2 7.3 7.4 7.5 7.6 7.7 7.8 7.9 above are included in lump sum i.e Schedule G.**

## **8. 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), Coach guidance system (CGS), utility boards (such as cloak room, parcel, waiting rooms etc.), Platform Indication Board (PIB) such as station name and service buildings etc. 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 etc. 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) All markers required to be painted on rails for curves, turnouts and SEJs etc. shall be painted by the Contractor as per IRPWM.

**All the above are included in Sch G i.e lump sum**

## **9. Drainage along the railway line**

RCC Side Drains parallel to track on both sides of track all along the cutting section as per attached L section to be provided (Approx cutting length: 4400 metre). Water from these drains should be suitably discharged to nearby bridges/low lying areas.

The design and specification shall conform to the relevant provision of Railway codes manuals and RDSO guide lines.

Minimum inside clear dimensions of these side drains to be **1.2 m wide** and **1 m deep**. Minimum thickness of side drains must be 150 mm doubly reinforced. RCC Central Drains (approx length 2670 m) in both yards in between lines i.e. 2 central drain in each yard to be provided with precast RCC cover. Yard drains to be pre cast, insitu casting not permitted. **No change of scope on account of side drains in cutting and yard drains is admissible.**

Catch water drain to be suitably designed as per Hydrology. Catch water drain of size 0.5 m by 0.5 m is to be provided at berms (for  $H > 6$  m) in the cutting section. Catch water drain at toe of cutting to be designed as per Hydrology and railway guidelines and got approved from Authority.

### **Scope of work under Sch G lump sum**

- Design Drawing of all types of drain
- Complete execution of side drains in cutting and station yard central drains
- Excavation of Catch water drain on berms as per design which is part of formation in cutting

### **Scope of work under Sch G-1**

- Complete execution of catch water drains at toe of cutting
- Execution of catch water drains (except excavation) on berms in cutting

Note- . The data and information provided are indicative and for guidance only. These should be re-checked, verified and modified by conducting site investigation to suit the site conditions duly approved by Authority Engineer and Authority.

## **10. Embankment/slope protection works:**

Retaining wall/ toe wall/bank protection works (except turfing payable under Sch G) shall be provided as per design and drawing as required at site and as approved by Authority Engineer. The contractor to carry out design and drawing of slope protection works in cutting/filling. Turfing is to be done on slope in the entire filling section.

Execution of slope protection works, retaining wall wherever required.

Slope protection works in cutting may include shotcreting, rock bolting, soil nailing, rock fall protection system which shall be proposed, designed by contractor and approved by A.E.

The retaining/toe wall in the block section shall be provided where the land is short for the toe of embankment as per the final alignment plan and provided right of way and other identified locations as per design/drawing proposed by contractor

### **Scope of work under Sch G lump sum**

- Design Drawing of all types of slope protection works
- Turfing

### **Scope of work under Sch G-1**

- Complete execution of all types of slope protection works except those covered under Sch G
- Retaining wall/toe wall wherever required if toe is short or due to any other situation

## **11. Supply of Materials and Stores**

Requirement of store depot/maintenance depot for permanent way etc. shall be as follows:

- Arranging labour (4000 Mandays) by the Contractor as and when required by the A.E, for various works i.e. receiving, issuing, safeguarding & supervision etc. for P.Way works under SSE/P.Way, with contractor's T&P, equipments, hand signal flags, etc. as per specifications and instructions from Authority Engineer. Same shall be payable as per Sch G-1
- Contractor shall be responsible for unloading of Free Rails, Rail panels etc. in Depot/station/Mid Section/between Stations in neat manner for railway uses from departmental material train.
- Contractor shall provide and run **3 SUVs and 7 multi-utility vehicles** ( capacity of minimum 1 MT with sitting capacity of 4/6 persons ) for entire project duration including running upto 2000 km per month as outlined in Schedule C. Contractor shall provide SUVs for running 2500 km per month as per Schedule C for entire project duration for Authority Engineer. All the cost of running, fuel, driver,maintenance to be borne by contractor. In case contractor fails to provide vehicles as per instruction of A.E. then recovery at the rate of 60,000 INR per month for SUV and 50,000 per month for MUV for each vehicle will be done. Deployment of vehicle to be as per instruction and approval of A.E.
- The P-way material inventory **as per para 6.13 above** shall be supplied by the Contractor at the time of commissioning.

**Cost of all these materials/stores are included in Sch-G lump sum**

## **12. Compulsory afforestation and tree plantation, Tree cutting and Coordination with Forest department**

Entire work is to be done in the Forest area. Compulsory afforestation may need to be done by contractor as per instruction of the Forest department and A.E. Strong coordination with the Forest department needs to be maintained by the contractor to ensure smooth work flow.. Conditions imposed by Forest as outlined in Annex IV Sch-A to be strictly followed and is included in scope of work under contract under Sch-G . Any violation of the Forest conditions outlined above during execution shall be the sole responsibility of the Contractor. In addition to above, Contractor shall design and do plantation of shady trees as well as ornamental plants in the station premises in a planned manner. The scheme and type of plants/trees shall be got approved by the authority. It is included in Sch G.

Tree cutting if instructed by A.E. to be done(which will be payable under Sch G-1 relevant item). Felled trees will be the property of Authority.

### 13. Cable Duct in entire section

Cable duct as per approved RDSO drawing issued vide letter No. STS/E/Cable-Laying Practices Vol-IV Date: 21.06.2023 attached with tender document. Cable duct along with chamber to be laid as per instructions issued in this letter. Cable duct size to be 300 mm by 300 mm. All cable ducts to be precast.

**The total length of cable duct assessed is 5650 m(excluding tunnels and bridges). Same is included in Schedule-G. Any increase or decrease in cable duct length will be payable or recoverable at the rate of 3542 INR per metre. Cable tray arrangement in tunnels is already included in Sch G of tunnel and for bridges is also included in Sch-G as per specifications detailed above in Bridge part in preceding paras of Schedule B. All cable duct in the block section to be pre cast.**

### 14. Noise Barrier, MS fencing and other requirements:

In forest area, the contractor shall provide and install suitably designed **Metallic Mono Absorptive type noise barriers** as per approval of the forest department as mitigation measures for wildlife, in coordination with forest department. The locations and type for provision of noise barrier shall be decided jointly with the forest department. The contractor shall coordinate/liaison with forest department and execute this work as per their approval .

MS fencing (duly approved by Authority Engineer) to be installed at railway boundary at locations approved by A.E.. in consultation with the Forest department.

**Cost of Noise barrier and MS fencing in section is included in Sch G-1 and will be payable as per items of Sch G-1**

Specifications of Metallic Mono Absorptive type Noise Barrier:

- 3 m height above parapet wall/wall constructed for erection of Noise barrier
- Work to be carried out as per IRC SP 130, EN 1793, EN 1794 for design wind speed upto 50 m/s
- Casting of wall if required over which noise barrier is to be erected, will be payable separately as per relevant item under Sch G-1
- Vertical poles shall be coated with PU/epoxy for protection, Grade E 250
- Centre to centre of pole 2.5 m to 3 m as per design
- Mono absorptive panels to be powder coated, and acoustic material enclosed with in GI frame
- Acoustic performance should be TESTED AND COMPLIANT WITH EN-1793 STANDARDS
- Rate mentioned in G-1 includes all supporting structural elements including base plate bolts
- Absorptive panels to be 100 mm thick, sheets perforated on the front and non perforated on rear face with infill of chemically treated water repellant mineral wool of 64 kg/m<sup>3</sup>

### 15. Change of Scope

Items have been clearly specified in Sch B as to what is included in Sch G and what is included in Sch G-1. 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(unless specifically mentioned), save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

**16. Recommended Make:**

LIST OF APPROVED MANUFACTURERS & SUPPLIERS, APPROVED MAKES for all works shall be as per letter attached with tender document titled *Approved Make/Brands Western Railway issued by PCE WR* (Letter number WR-HQENG (WWTC)/4/2019/E-907. If any item is not covered, same shall be got approved by Authority Engineer before actual use.

**17. Signalling and telecommunication**

Not in the scope of this contract.

**18 Electrification of RAILWAY LINE****18.1 Overhead Equipment (OHE)-**

**The scope of work covered under schedule G (EPC mode) as per item 2.1 of Sch G**

S.N.	Nearest Station	Type of Switching Post	Remarks
1	Kulthana Station (29/600.00 km)	SP (Kulthana)	Location/Chainage is subject to approval of General Power Supply Diagram, which is in the scope of Contractor
2	Rajpura Station (41/320.00 km)	SSP (Rajpura)	

**18.1.2 10 KV Auxiliary transformer stations**

**The scope of work covered under schedule G (EPC mode) as per item 2.3 of Sch G**

S.N.	Location	Capacity	Quantity	Remarks
1	Km: 29/500.00	10 KVA	01 no.	Kulthana Station
2	Km: 41/400.00	10 KVA	01 no.	Rajpura station
3	Km: 29/600.00	10 KVA	01 no.	Kulthana SP
4	Km: 41/320.00	10 KVA	01 no.	Rajpura SSP

**18.1.3 25 KV Sectioning post (SP) and sub-sectioning post (SSP) (Switching Post)**

**The scope of work covered under schedule G (EPC mode) as per item 2.2 of Sch G**

Design, supply, erection, testing and commissioning of single phase, 25 KV, 50 Hz, AC Switching

Stations (SP/SSP) including Foundations, Structures and all ancillary equipment etc. as per following details along with Earth work, construction of buildings, fencing, retaining wall, Internal Wiring with switch/fittings/equipment, Battery Set, All types of caution, warning, instruction, protection, location/Name and schematic diagram boards, earthing stations, Cross feeder erection and connection to OHE, Safety items (i.e. Firefighting equipment, First Aid box, Shock treatment chart, key box etc.), manning till stabilization of SCADA (At least for a period of 06months from commissioning) and all necessary documentation for EIG sanction and CRS Inspection, breakdown maintenance till CRS/PCEE inspection.

(Note: -All SP/SSP/FP are to be designed and constructed keeping in view of Double Line section for future. Earthwork, Fencing, Foundation activities are to be completed suitable for double line section)

S.N.	Nearest station	Type of Switching Post	Remarks
1	Kulthana Station (29/600.00 km)	SP (Kulthana)	Location/Chainage is subject to approval of General Power Supply Diagram, which is in the scope of Contractor
2	Rajpura Station (41/320.00 km)	SSP (Rajpura)	

#### 18.1.4 Supervisory control and data acquisition system (SCADA).

##### The scope of work covered under schedule G (EPC mode) as per item 2.2 of Sch G

The scope covers provision of station (SCADA) Equipment at Switching Posts (SP/SSP) and modification in the software of Standard Supervisory Control and Data Acquisition (SCADA) equipment as per **RDSO Specification No. TI/SPC/RCC/SCADA/0134** with latest amendments to accommodate the equipment of new switching stations of the proposed electrified section.

S.N.	Item	Quantity	Remarks
1.	Remote Control Centre with SCADA Hardware and software	NIL	Existing RCC at Ratlam.
2.	Modification of existing SCADA System	01	Modification in Software to accommodate equipments of new Switching posts
3	SCADA Equipment at Traction Sub-Station	NIL	
4	SCADA Equipment at Switching Posts (SP/SSP)	02 Nos.	



### 18.1.5 Various electrical general services work:

#### The scope of work covered under schedule G (EPC mode) as per item 2.4 of Sch G

- (a) All Electric General works in **Newly Constructed Station Buildings and other Service Buildings (Relay Room, Battery Room etc.)** including supply and erection for Cabling, wiring, Panels, Switch Gear, Equipment Fittings, Pumps, Yard Lighting, Street Lighting etc. are to be completed and commissioned. **Details as per attached approved GADs.**
- (b) All Electric General works in **Traction Power LT Supply through Auxiliary Transformers (ATs)** including supply and erection for Cabling, wiring, CLS Panels, Switch Gear, Equipment Fittings, etc. in all Stations, Cabins, and ensuring Traction Power LT Supply up to signalling Relay Room / Panel Room, OFC Hut and other required Locations are to be completed and commissioned. **Details as per attached approved GADs.**
- (c) All Electrification Works in Newly Constructed Tunnels with Their Power Supply Arrangements and Lighting Arrangement.

### 18.1.6 Modification of HT/LT power lines and crossings (replacement by UG cabling)

#### The scope of this work covered under schedule G1 (BOQ ITEMS) as per item G1B.

All modification works pertaining to the overhead and underground HT/LT power line crossings in the section infringing the OHE/Track alignment as per IRSOD, and to replace the same by converting into suitable underground cable crossing, are to be completed and commissioned. excavation of pit and under the track in soft soil/morrum, refilling and concreting for making pole/foundation, muffing, curing and foundation ratio be 1:3:6, complete pole with two coated Red oxide and two coated aluminium paints of good quality.

All type of testing, fixing and commissioning of all electric equipment including insulator, earth and steel e.t.c., also the supervision and liasoning work for all the HT/LT crossings.

### 18.1.7 Extension/Augmentation of electrical power supply arrangements and associated works

#### The scope of work covered under schedule G (EPC mode) as per item 2.5 of Sch G

Augmentation of power supply works includes all general supply works from state electricity authority supply point to stations and service building metering panel. This also includes the extension of HT electrical supply for tunnel electrification from nearest state electricity supply point. It includes Liasoning with state electricity authorities for releasing of new power connection or augmentation of existing connection duly providing new transformer/substation wherever required, new panel with metering arrangements, laying of HT/LT cables in trench as well as on surface of required size as per requirement and site condition, necessary earthing arrangement, distribution panel with MCCB and laying of cables upto metering panel of service building and quarters. The contractor needs to design the system and get approval from authority through authority engineer. All equipment/cable etc. shall be of approved make as approved by authority.

Note: The payment of all SEB demand charges including supervision charges during the railway electrification process, wherever applicable, shall be in the scope of the tenderer.

S.N.	Location	Load (KWH)	Remarks
-	-	-	<b>Load shall be as per submitted drawing by successful bidder</b>

### 18.1.8 Inventory electrical

#### **The scope of work covered under schedule G (EPC mode) as per item 2.1. Of Sch G**

The Contractor shall be responsible for the procurement and supply of specified permanent materials to Railway stores in accordance with RDSO standards, while simultaneously mobilizing all necessary Tools & Plant (T&P) equipment required for project execution. This includes ensuring all items undergo mandatory inspection and meet the technical requirements for both site works and inventory replenishment.

#### **Supply of inventory / T&P items (Electrical) to Railway:-**

The scope shall cover the supply of T&P from approved source/make in mentioned quantity listed below: -

Tenderer shall get approved the make of all T&P items from Dy.CEE(C) before procuring the same.

S. NO.	T&P items	Unit	Qty
1	Pull lift machine 3 tonne pulling capacity and 3 tonne lifting capacity Make Tracel Tirfer India Pvt Ltd or similar	Nos	5
2	Pull lift machine 5.2 tonne pulling capacity and 3.2 tonne lifting capacity Make Tracel Tirfer India Pvt Ltd or similar	Nos	5
3	Pull lift machine 1.5 tonne pulling capacity and 2 tonne lifting capacity Make Tracel Tirfer India Pvt Ltd or similar	Nos	5
4	Earthing discharge rod complete.	Nos	10
5	Aluminium straight ladder (9.3 m) with hook on top.	Nos	5
6	Aluminium folding ladder (11 m) with hook on top.	Nos	5
7	Portable electric drill machine 21mm, single phase 230 Volt ( for drilling rails for bonding).	Nos	1
8	Contact wire cutter 36".	Nos	4
9	Dropper wire cutter 12".	Nos	4
10	Single sleeve pully block 3 1/2" x 1/2" groove steel.	Nos	5
11	Contact wire twist cum bender 6"	Nos	3
12	Steel sling 1m long, eye at each end 19 mm dia.	Nos	5
13	Steel sling 2m long, eye at each end 19 mm dia.	Nos	5
14	Steel sling 3m long, eye at each end 19 mm dia.	Nos	5
15	Steel sling 4m long, eye at each end 19 mm dia.	Nos	5
16	Steel sling 5m long, eye at each end 19 mm dia.	Nos	5
17	Fabric metric tape 30 mtr long 15 mm wide each.	Nos	5
18	Engineering ratchet with socket set	Nos	4
19	Earth Megger/tester	Nos	1
20	Screw driver set consisting of 6", 8", 12", 16" & 18"	Set	5
21	Insulated cutting plier (12") & (8")	Set	10

22	Sprit level (12") & (6")	Set	4
23	Tensometer IDT-10 Ton capacity.	Nos	1
24	Hydraulic crimping tool.	Nos	1
25	Bench grinder (Double end pedestal) Motor driven.	Nos	1
26	50W LED flood light IP65 rating	Nos	4
27	Syren covering distance one kilometer (Electric).	Nos	1
28	High Beam (Range 1 km) rechargeable 15W LED torch	Nos	5
29	D' Spanner double ended 24 sizes in a set of 12 pieces Gedore make or equivalent	Nos	5
30	Ring spanner double ended 24 sizes in a set of 12 pieces Gedore make or any other substantially equipment make.	Nos	5
31	Portable fire extinguisher capacity 4.5 Kg DCP type.	Nos	6
32	Di- Electrical safety shoes, Electric Shock Resistant up to 30 KV as per specifications, complying to ASTM F1117-03, ASTM F2413-18 and EN 503211/IS 15928(P-II) of latest versions in assorted sizes (UK 6-10). Preferred make/brand: - safewell	Nos	25

18.1.9 Completion of all type of OHE fixing arrangement and general electrical fixing arrangement inside tunnels

**18.1.10 The scope of work given above shall include but not limited to :**

**The scope of work covered under schedule G (EPC mode) 2.1 to 2.5 of Sch G, wherever applicable.**

**i. Cement concrete**

The depth of the excavation shall be measured from the formation level to the maximum excavated point. The contractor shall arrange for diversion of masonry/earth drain wherever necessary for casting of foundations.

- (a) RDSO guidelines shall be followed for grade of concrete, type of foundations etc. Generally Concrete for foundation shall be nominal mix of Grade-M-10 and for grouting, mugging, embedding of structure in foundation concrete of M-15 Grade or as per latest RDSO guidelines shall be used.
- (b) In Soft/Hard rock, Foundation in contact/Buried under Non-aggressive soil/ground water: Foundation concrete shall be of M-15 grade and core concrete shall be of M-20 grade.
- (c) In Soft/Hard rock Foundation in coastal area: Foundation as well as core concrete shall be of M-20 grade.

Concrete for foundations shall be nominal mix of grade M10 obtained by mixing cement, coarse aggregate, fine aggregate and water in accordance with proportions given vide table 3 of IS:456:1978 reproduced below. Water Curing of each foundation should be done for 21days twice each day for strengthening of foundation.

For grouting, mugging, embedding of structures in foundation nominal mix concrete M.15 obtained mixing materials in proportions as indicated in table 3 of IS:456-1978 shall be used Volume batching may be adopted vide clause 9.2.2IS:456-1978 reproduced below-

IS: 456-197

TABLE-3 PROPORTIONS FOR NOMINAL MIX CONCRETE

Grade	Total quantity of dry aggregate by mass per 50 kg Of cement, to be taken as the Sum of the individual masses of the fine and coarse Aggregates Kg. max.	Proportion of fine aggregate & coarse aggregate (by mass)	Quantity of water per kg of cement max
1	2	3	4
	KG		liters
M 5	800	Generally 1:2 but subject to an upper limit of 1:1 ½ and a lower limit of 1: 2 ½	60
M 7.5	625		45
M 10	480		34
M 15	350		32
M 20	250		30

Note- The proportions of the fine to coarse aggregates should be adjusted from upper limit to lower limit progressively as the grading of the fine aggregate becomes finer and the maximum size of coarse aggregate becomes larger graded coarse aggregate shall be used.

Example:-For an average grading of fine aggregate {i.e. II of the table for of IS:383-1970 Specification for coarse and fine aggregates from natural sources for concrete (second revision), the propositions shall be 1:1½ , 1:2 and 1: 2½ for maximum size of aggregate 10mm, 20mm & 40mm respectively.

“ In case uniformity in the materials used for concrete making has been established over a period of time, the proportioning may be done by volume of batching, provided periodic checks are made on mass/volume relationship of the materials Where weigh – batching is not practicable, the quantities of fine and coarse aggregate (not cement) may be determined by volume. If the fine aggregate is moist and volume batching is adopted allowance shall be made for bulking in accordance with IS: 2386 (Part-III) – 1963 methods of test for aggregate for concrete part-III specific gravity, density, voids, absorption and bulking”.

In judging the acceptability of the materials, quality of concrete and the method of work, the purchaser will generally observe the provisions of the “Indian standard code of practice for plain and reinforced concrete. IS: 456-2000. The crushing strength of concrete shall not be less than the limits given below:-

Crushing strength of 15 cm. Cubes by work test

Concrete	At 7 days age	At 28 days age
a) M10	70 Kg/cm <sup>2</sup>	100 Kg/ cm <sup>2</sup>
b) M15	100 Kg/ cm <sup>2</sup>	150 Kg/ cm <sup>2</sup>

Note – (a) Test specimens of works shall be taken at the site of work from a mixture of concrete ready for pouring in the pouring in the foundation hole. All tests shall be carried out in accordance with IS: 516 – 1959 or its latest version. The sample of the concrete from which test specimens are made shall be representative of the entire batch.

- (b) Age is reckoned from the day of casting.
- (c) For foundation work the graded coarse aggregate i.e mixture should be mixed by mixing machine only.

For foundation work the graded coarse aggregate i.e. mixture should be mixed by mixing machine only. Concrete for foundations shall be a nominal mix of grades as per IS 456 latest version.

The Contractor shall arrange to provide concrete testing samples for tests before start of foundation work and at every 50 cubic meters of foundation work completed or as and when required by the Purchaser, to determine crushing strength after 7 days or 28 days curing as required. Testing shall be arranged by the Purchaser at his own cost.

Contractor shall Jointly sign DPR for each foundation with Railway's representative

**SIZE & GRADING OF AGGREGATES:-**The graded coarse aggregate 40mm nominal size (Table 2 of IS 383-1970) shall be used for foundation. A coarse aggregate for grouting muffs and embedding shall be of 20mm graded nominal size as per table 2 of IS 383- 1970 (Specification for coarse and fine aggregate from natural sources for concrete).

Fine aggregate shall be graded from 10mm downwards. The maximum size of aggregate for under reamed pile foundation shall be 20mm graded nominal size. River sand should be used for concrete work.

- ii. Drilling holes of up to 50 mm dia for cable tray, ATD, Anchor, Anticreep Anchor, Cantilever assembly, Bond, Feeder, Jet fan, Number plate, and any other item specified by Railway in the Tunnel and removing the rock/ soil/ concrete fallen due to cavity formation and disposal of surplus spoils at locations and also as directed by the engineer -in charge with all lead and lift (all labour and materials by the contractor.). Drawing has to be submitted by firm and get it approved by Railway before start the work.

- Iv Supply and fixing of Cable Tray support angle and Supply and fixing of TGT bolts of size 25/20/16/12/10/5 mm dia and 750/620/ 210 mm long or less up to 500 mm Corrugated surface with hex nut, lock nut, Flat washer and spring washer for cable tray, ATD, Anchor, Anticreep Anchor, Cantilever assembly, Bond, Feeder, Jet fan, Number plate, and any other item specified by Railway . Fixing and grouting of bolts should be with pressure grouting in the drilled holes in the tunnel with approved quality of epoxy resin harder and thinner (Araldite, Aradur, Fosroc, HILTI HY 200RV3 or HILTI RE500V4) by suitable proportions including filler, such as silicon flour, etc as recommends by manufacturer and also as directed by the Engineer -in charge with all lead and lift (all labour, materials and tools and plants like pneumatic driller equipment's, pressure injection, air compressor portable generator, etc by the contractor. The contractor's supply of items such as epoxy, resin and hardener should be provided with necessary test certificate for pot life test , strength test from approved test houses. The rate is also inclusive for providing lighting arrangements while execution). Pull out test to be conducted on some fixed bolts by the firm. All type of fixing arrangements drawing has to be submitted by firm and get it approved by Railway before start the work.

- V. Earthwork in filling and providing Stone Pitching work near OHE foundations for strengthening of OHE foundations including extra platform near ATD masts and near bridge locations , as directed by Engineer in charge. Rates include cost of carrying, handling, transportation with all lead and lift as a complete job.

SCHEDULE - C  
(See Clause 2.1)  
**PROJECT FACILITIES<sup>18</sup>**

**Project facilities**

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

**1. Civil works**

- a) Office for Authority's Engineer & his team (principal site office and off site offices)
- b) Training set up
- c) Survey equipment
- d) Transport facilities.
- e) Project Monitoring facilities

**1.1 Description of Project Facilities:** Each of the Project Facilities is described below:

- (a) Office for Authority's Engineer & his team (principal site office and off site offices)

As per clause 7.3 Sch B (staff quarters), Authority plans to use 2 Type III quarters at Kulthana and 2 Type III quarters at Rajpura as Principal site offices. **Quarter at Kulthana to be completed in 7 months from Appointed Date and quarter at Rajpura to be completed within 12 months from Appointed Date including all civil/electrical/sewerage water supply work.** Failure to complete as per the mentioned time line, a penalty of 20,000 INR per week for each location will be imposed. These Principal site offices need to be furnished with required accessories as detailed below. Since the locations are inside forest area, in addition to Principal site offices, porta cabins/container need to be set up for making stay arrangements for engineers of Authority Engineer. At each location i.e. Kulthana and Rajpura, all weather porta cabins in addition to these principal site office to accommodate 10 engineers of A.E at each location to be provided, it will function as rest house for stay of A.E, engineers. Fully furnished Conference halls at both locations i.e Kulthana and Rajpura to be provided which may be in the form of pre fab structure of size (50 m2)

Various off site offices may be required at tunnel/bridge locations which can be in the form of All weather porta cabins/containers duly furnished with furniture including with Air conditioners. The locations to be got approved from Authority Engineer.

- I. All buildings i.e Principal site office along with all weather porta cabins/containers shall be supplied with continuous (24 hours) running potable cold water to the kitchen (RO water) and wash rooms (raw water).
- II. All buildings Principal site office along with all weather porta cabins/containers shall be supplied with electricity, AC 240 voltage 50 HZ that shall be distributed to each room in accordance with the regulation. 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 Engineer. 24 hours power supply is to be arranged by contractor to meet full power load. Each room of the office building shall be provided with an adequate number of Fans, ACs, heaters/blowers as decided by the Authority's Engineer.

- III. Fire fighting equipment shall be provided in accordance with the local department's recommendations.
- IV. The kitchen in Principal site office shall be furnished and arrange Tea/Coffee making facilities for 15 persons including refrigerator at each principal site office i.e Kulthana and Rajpura
- V. The office building shall be provided with Project network with project monitoring software like Trimble Tilos or equivalent, fax and e-mail facilities and mobile communication network for project monitoring. Offices to be equipped with WiFi

## 1.2 Authority's Engineer's Accommodation for Off Site Work

- (i) At tunnel and bridge locations, all weather porta cabins/pre fab structure to be provided with locations approved by Authority Engineer. These will accommodate engineers of A.E at site where continuous deployment is essential to check the quality and attend all RFIs timely. These will be used as rest house for stay of A.E. engineers. Locations to be got approved from A.E.
- (ii) These must be equipped with A.C, clear RO water, furniture table chair, toilets as per approval of A.E.

## 2.1 Sanitation and Sewerage at Principal site offices/off site offices and porta cabins

- (i) Sanitation and Sewerage systems for the 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.
- (ii) The Contractor shall provide a properly designed and constructed septic tank approved by the Engineer for the disposal of domestic sewage from each building in the Engineer's site offices.
- (iii) Each septic tank shall be regularly emptied, maintained and serviced by the Contractor to ensure proper functioning.

## 2.2 Office cleaning, waste and garbage disposal:-

- (i) The Contractor shall provide personnel and perform daily cleaning of all rooms in the Authority's Engineer's offices
- (ii) The Contractor shall collect and dispose off, in a location and manner consented by the Engineer, all domestic waste and garbage from the Authority's Engineer's site offices on a daily basis.

## 2.3 Furnishing requirements

The Contractor shall provide the new furniture and equipment to the Authority's Engineer's Principal site office in the manner required by the Authority's Engineer within the specified period with respect to appointed date; the same shall be **the property of the contractor** on completion of the project. Given below is the indicative list of items required for Engineer's office in the Principal Site office.

S.No.	Description	Principal Offices	Site
1.	Conference table	2	
2.	Conference Chairs	30	
3.	Glass-fronted lockable bookcase	2	
4.	Double pedestal desk (size 1500 mm x 900 mm)	Sufficient to cater to	

		the requirement of Authority's Engineer and his team
5.	Swivel office chair with armrests	5
6.	Swivel office chair without armrests	5
7.	Computer set, printer (with photocopy & scanning facility), Typist chair and other allied items	Desktop Computer-10 Color Printer-A4-4 no. A3- 2no.
8.	Computer table with revolving chair	10
9.	Visitors chair	10
10.	3-shelf bookcase	5
11.	4-drawer filing cabinet	5
12.	Lock-able cupboard 6 ft high with internal shelves	5
13.	AO size drawing hanger for 500 drawings	2
14.	Sofa set	2
15.	Heavy Duty Paper Shredders	1
16.	Multi-Functional Movie projector(with screen)	2
17.	Floor mounted safe (size -750mm x 450mm x 600mm )	1
18.	Crockery/cutlery set	4
19.	RO	2
20.	2 L kettles	2
21.	Required spares, ink cartridges and papers of sizes and types for Scanner, Printer cum Photocopier as mentioned including maintenance contract for the machines to ensure defect free operations for the period upto project completion	As per requirement
22.	Waste paper baskets	20
23.	Desk tray sets	20
24.	First aid kits for up to 15 persons	3
25.	Safety helmets	40
26.	Safety Harness	15
27.	Noise Retarder Ear Caps	40
28.	Safety Boots (various sizes)	30
29.	Day-glow waistcoat	25
30.	Large Format Plotter -1 no.	HP Model c6084A(3800CP 54 colour plotter) or similar with latest specification.

**Note:** - In case of failure to provide the equipment within specified period with respect to Appointed Date, recovery @ Rs 15,000/- per week or part thereof will be imposed.



In addition to the above listed items, the Contractor shall provide the following personnel:

Sn	Description	No. of personnel required
1.	Software Engineer well conversant with operation of various softwares to be used for this project i.e. Trimble TILOS or equivalent, Autocad, Microsoft office etc and day to day office working i.e. typing, printing, scanning etc.	01 No for Authority's Engineer
2	Software on each computer	MS office latest, Autocad 3D latest, Trimble tilos or equivalent
2	Field / Office Attendants/Chainmen	15
3	Watchmen/Security Guard	1 at all times round the clock At all site office and Principal office

## 2.4 Office Maintenance

The contractor is required to maintain the principal site office & other site offices (as described above) throughout the contract period and provide the following, but not limited to:

- (i) Pay all electricity charges.
- (ii) Providing and recouping all stationery, pantry items etc.
- (iii) Pay the internet connection bills for the use of the Authority Engineer's /his team's office.
- (iv) Pay all water charges.
- (v) Carry out necessary repairs to office/equipment as & when required.
- (vi) Any other statutory charges to local authority.

## 2.6 Road Transport

- i. The vehicles shall be new vehicles, delivered & 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.
- ii. The Contractor shall employ and make available competent drivers fully licensed to operate the vehicles as & when required by the Consultant/Employer. The Contractor shall replace drivers at the request of the Consultant/Employer.
- iii. The vehicles shall be licensed and insured for use on the public highway and shall have comprehensive insurance cover for any qualified driver authorised by the Consultant together with any authorised passengers and the carriage of goods or samples.
- iv. The Contractor shall provide fuel, oil for running of each Vehicle and ensure maintenance in conformity with the vehicle manufacturer's recommendations and all toll/parking charges incurred in connection with the Works. The vehicle shall be provided day & night as required by the Authority.

- v. The vehicle to be available 24\*7 and will be in custody of Authority Engineers representative.

A suitable replacement shall be provided by the contractor for any vehicle out of service for more than 24 hours/absence. Deduction at the rate of 60,000 INR per month per vehicle for SUV and 50,000 INR per vehicle per month for MUV will be made in case any vehicle is not provided.

## 2.7 Number of Vehicles

The Contractor shall provide the following type of vehicles as per requirement indicated by Authority's Engineer/Representative within 30 days of the appointed date for the project duration

Type	Numbers
XUV 700/SCORPIO/Innova Crysta	Total 4= 3+1 (1 no. for electrical) Nos Vehicles (with 24x7 availability)
Toyota Hilux/Bolero Max/Tata Yodha	Total 7= 6+1 (1 no. for electrical) (with 24x7 availability)

## 2.8 Duration of Transport Required

**Transport for the Authority's Engineer/Representative shall be provided so as to cover the-entire completion period including any Extension of Time granted by Authority. All the cost of transportation are deemed to be included in Sch-G. Extension of time when provided will not constitute change of scope for providing the above mentioned transportation. The transportation as mentioned above to be provided till project Completion period including all EOT granted by Authority.**

## 2.9 Survey Equipments

Contractor to maintain survey equipments such as Total Station, Auto Level, DGPS and its numbers as per instruction of Authority Engineer in good and usable condition. Periodic calibration as per manufactures specification and good practice to be done. Malfunctioning equipment to be replaced.

## 2.10 Project Monitoring facilities.

Contractor to install CCTV IP based video recording system at all major/mega bridges/tunnels/locations of piling work/any other locations where hidden items are involved as per instruction of A.E as per RB letter 2023/W-I/Gen/Gatishakti dtd 26.03.2025 attached as Annexure. The permanent recording of each site to be handed over to A.E after completion of work at each site. Live recording also need to be shared with A.E for live monitoring. Same is deemed to be included in Sch-G

## 3.0 Contractor's Project Organisation

The content given below is for guidance only. It can be modified as per requirement of Authority.

- 3.1 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 etc. 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	20	B. Tech (Civil Engg.)
2	PMs for Civil, Tunnel, Electrical	3	10	B.Tech in relevant field.
3	Safety Consultant	1	10	Refer para 10.2.11 under Article-10
4(a)	QualityControl/Assurance Manager /Civil	2	10	B.Tech in relevant field.
4 (b)	Quality control Engineers	5	10	B.Tech/Diploma in relevant field.
4(c)	Quality Assurance Engineer/Electrical	1	10	B.Tech/ diploma in relevant field.
5 (a)	Tunnel Construction Engineer	3	5	Btech in relevant field with experience of tunneling using NATM
5 (b)	Tunnel instrumentation Engineer	2	5	Btech/Diploma in relevant field
5(c)	Tunnel geologist	2	5	Bsc/BS in geology
6(a)	Site Engineer (Civil)	At least 8	5	B.Tech/ diploma in relevant field.
7(c)	SiteEngineer (Electrical OHE)	1	5	B.Tech/ diploma in relevant field.
8	Asst. Site Engineer	At least 15	3	Diploma in relevant field.
9	Computer Operator with knowledge of Software like Trimble Tilos or equivalent, AutoCAD, Microsoft Office, etc	3	5	Graduate
10	Planning Engineer	1	10	B.Tech/ diploma in relevant field.
11	Surveyor	4	8	B.Tech/ diploma in relevant field.

- 3.2 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.
- 3.3 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

3.4 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
- (iii) Rs. 80,000/- per head per month for Sr.No. 4, 5,10,
- (iv) Rs. 50,000/- per head per month for Sr.No. 6,7,11
- (v) Rs. 40,000/- per head per month for Sr.No 8
- (vi) Rs. 20,000/- per head per month for Sr.No 9

3.5 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. 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.

3.6 The contractor's technical personnel should work in cohesion with Authority Engineer's personnel.

The agency shall provide adequate personnel to facilitate the PMS/PSSA engineers in collecting samples, in conducting various quality control tests, in carrying out survey works, in checking measurements, facilitating site inspections, etc. as required. **RFI based system of inspection will be followed for execution of all works.**

(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 defined in this document. 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 a 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 members.

- (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:
  - (b) Working Drawings and Documents,
  - (c) the technical submissions as required under the Contract,
  - (d) 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 etc.;
- (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's Engineer with the approval from Authority and Indian Railways.

### **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) Conduct a drone based aerial survey for the generation of orthophotos as per updated Railway Guidelines.
  - (b) Geological Investigation Report and evaluation of sub-surface conditions for Permanent Works along the alignment including tunnels
  - (c) Geological Investigation Report for borrow areas, Tunnels etc.
  - (d) Material test report for embankment fill, prepared subgrade, blanket material, structural steel, bearings for steel bridge spans, cement, reinforcing steel, water, sand, aggregate etc. for concrete works
  - (e) Slopes stability calculations
  - (f) Analysis of stability and settlement of embankments/tunnels and design of remedial measures (if required)
  - (g) Details of construction equipments
  - (h) 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 etc. required due to site conditions. He shall also be responsible for all the temporary works.

#### **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 Permanent Works, 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.

The 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.

### **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 processes 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 throughout 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 insofar 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 etc. 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 etc. 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 In charge 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 etc. including signage Boards

#### **1.6.2.2 Measures during execution of Work**

- (i) It shall be ensured that no workmen and staff are working on line / trackside unless a 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 etc.
- (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 design and 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 etc. 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 etc., 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 & switchgear 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) watercourses 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 will be as conditions mentioned in this document, 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 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:

Sr. No.	Description
1	Indian Railway Code, for the Engineering Department
2	Indian Railway Construction Manual
3	Indian Railway Permanent Way Manual
4	Indian Railway Works Manual
5	Rules for the opening of a Railway for the Public Carriage of passengers
6	General & Subsidiary Rules, Pt.- I & II
7	Schedule of Dimensions
8	Manual of Instruction of fabrication, installation and maintenance of glued insulated rail joint
9	Code of practice for Flash Butt Welding of rails
10	Code of practice for welding of rail joints by Alumino Thermit Process
11	Indian Railway Bridge Manual
12	IRS Concrete Bridge Code
13	IRS Code of practice for The design of substructures and foundation of bridges
14	IRS Bridge Rule 1964
15	IRS Specification (IRS B-1 and BS-110), BS -111 (HSFG) with latest correction
16	IS:1786-1985, Specification for high strength deformed steel bars and wires for concrete reinforcement
17	IS:875
18	IS:456-2000, Plain and reinforced concrete code of practice
19	IS:383-1970, Specification for coarse & fine aggregates for concrete
20	IS:269-1989, Ordinary Portland Cement 33 grade specification
21	IS:8112-1989, 43 Grade Ordinary Portland Cement
22	IS:12269-1987, Specification for 53 Grade Ordinary Portland Cement
23	IS:516-1959, Method of testing for strength of cement
24	IS:1383-1980, Code of practice for pre-stressed concrete
25	IS:1948-1970, Classification & Identification of soils for general engineering purposes
26	IS:2062
27	Comprehensive guidelines and Specifications for Railway Formation specification No. RDSO/2020/GE: IRS-0004, Sept.-2020 with latest correction slips
28	IRS: Code of practice for plain, reinforced & pre-stressed concrete for General Bridge Construction
29	RDSO Station Manual on Indian Railway
30	IS:800-1984, Code of practice for General construction in Steel

31	USFD Manual
32	Codes, Indian Railways Standard for Bridges, structures and other subjects
33	Signal Engineering Manual
34	Signal Engineering Manual Appendix &II
35	ACTM Volume - I & II
36	Indian Railway Electricity Rules
37	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
38	BS-126, Guidelines for continuation of LWR/CWR over ballasted deck with latest correction
39	IRS Welded Bridge Code
40	Transition system on approaches of bridges, Report No GE: R-50/Revision-2
41	IS: 2720 latest version —Method of test of Soil.
42	IS: 2911 latest version —Design and construction of pile foundations- code of practice.
43	IS: 1904 latest version —Code of practice for design and construction of foundation requirement.
45	IS: 6403 latest version —Code for determination of bearing capacity of soil.
46	IS: 4091 (2011) —Code of Practice for Design and Construction of Foundations for Transmission Line Towers and Poles.
47	TI/IN/0035 —Instruction for testing of OHE structure 's foundation issued by RDSO.
48	Design Manual for Electric Traction Vol.-III Traction Over Head Equipment (RITES).
49	RDSO Instruction No. TI/IN/0043 Rev.0 with latest amendments- PSI guideline for 2 x 25 KV system
50	TI/SPC/RCC/SCADA/0134 with amendment slips or latest “Technical specification for SCADA system for 25 kV and 2x25kV Single Phase 50Hz AC Traction Power Supply” issued by RDSO
51	RDSO Instruction No. TI/IN/0042 with latest amendments- OHE guideline for Increasing Speed Potential to 160kmph
52	BS-121: Guidelines For Provisions Of Ohe Mast For Electrification At New And Existing Bridge Pier/Abutment
53	Reliability Action plans and TC-127 vide HQ letter no. EL: 94/15/1 dtd. 23.03.2026.
54	The above list is indicative. Any relevant IRS Codal provisions, IRC codal provisions and IS(BIS) Codal provisions as approved by the Authority.

### 3 Latest Version

Latest version of the Manuals, Specifications and Standards including the amendments notified/

published by the Base Date upto NIT calling shall be considered applicable.

#### **4 Terms used in Manuals**

The terms ‘Inspector/JE/SSE’, ‘AXEN/XEN’, ‘DEN’, ‘Dy CE’, ‘Sr DEN’ 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.

#### **7 Contractor's Organization during Construction Phase**

##### **7.1 Project Organization Plan**

**(a)** The Contractor's Personnel shall be deployed and maintained as defined in this document. 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 etc.;

(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. Contractor's Coordination With Others**

### **8.1. 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.

## **9 Tunnel Specifications and conditions**

- 9.1 Various tunnel specifications are given in "Tender Document Vol II Tunnel specifications & Preliminary report". Work strictly need to be done in accordance with those specifications

## **10 Specifications for Noise barrier**

As defined in Sch B. Noise barrier must be as per IRC SP 130, EN 1793, EN 1794 standard compliant

Annex - I  
(Schedule-D)

**Specifications and Standards for Construction<sup>19</sup>**

**1 Specifications and Standards**

All Materials, works and construction operations shall conform to the following manuals:

**1.1 For civil works:**

- (a) Indian Railways Permanent Way Manual
- (b) Indian Railway Bridge Manual
- (c) Indian Railway Schedule of Dimensions
- (d) The relevant IRS Specifications referred to in the above documents listed at (i), (ii) and (iii)
- (e) Specifications of Works of concerned zonal railway
- (f) In case of any contradiction in the various codal provisions, the order of precedence shall be as follows:-
  - aa) Provisions of this Annex I and specs described in preceding paras and also defined below in Sch D
  - bb) IRS Codal provisions
  - cc) IRC Codal provisions
  - dd) IS (BIS) Codal provisions

**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

**2 Deviations from the Specifications and Standards -NIL**

**3 Make of material to be used in all works.**

**LIST OF APPROVED MANUFACTURERS & SUPPLIERS, APPROVED MAKES**

**for all works shall be as per letter attached with tender document titled *Approved Make/Brands Western Railway issued by PCE WR* (Letter number **WR-HQENGG(WWTC)/4/2019/E-907****

In addition to above, list of approved makes/brands for various items is attached separately on IREPS Portal. In case of non availability of material of approved brands/makes, the contractor will submit the proposal along with details of precedence and performance in other works for approval of Authority.

For electrification work items, material shall be procured from RDSO/CORE approved sources.

#### **4 For electrification works Specifications are detailed below**

##### **4.1s Details of Governing Specifications for Electrical TRD (OHE & PSI) Work:**

##### **1. GENERAL**

In general, based on the specifications issued by various bodies, such as Bureau of Indian Standards, British Standard Institution etc. Specifications have been issued by the Purchaser. Such specification may be brought separately from the office of the Purchaser. All these specifications are included in the set of drawings and specifications.

##### **(a) SPECIAL INSTRUCTIONS**

- (1) The tenderer should inspect the site of various locations before quoting the rates and should acquaint himself with the scope of work, method of execution and approach roads which are leading to the locations so that no difficulty is experienced at the time of execution of the work.
- (2) Tenderer should have his own permanent establishment/ independent office and should have experience in executing similar type of works, in any of the Government organization, for which he should submit his credentials, certificate of completion of work.
- (3) During the execution of the work, the contractor shall have to observe utmost safety while carrying out digging and laying work of the cable, all the work shall be executed in the presence of Railway Representative. If any damages are done by the contractor's labour during digging, then the loss shall be borne by the contractor.
- (4) The contractor should ensure that during the execution of work, either he himself is present at the site or his responsible engineer should always remain present at site Co-ordination shall be maintained with this office for day-to-day planning and execution of the work, which is to be completed within the targeted period.
- (5) The tenderer should fully understand that the instant work is a targeted work. This work is to be completed well before the target as such every care shall have to be taken to maintain the completion period.
- (6) The contractor shall have to make his own arrangement for transportation of materials and keep all materials safely at his own depot at site, tools, labour etc at site for the execution of the work.
- (7) Contractor shall have to execute all works in accordance with latest RDSO/IE rules and Track crossing regulations.
- (8) All materials should be complying with **latest RDSO/CORE specifications and SMI/MI&TCs**. All material should also be purchase from **RDSO/CORE approved**

**vendors** and shall be supplied with dully inspected by Rites stage inspection as well as final inspection.

## 2. COMPLIANCE WITH STANDARD SPECIFICATION

In the technical specifications of equipment's, components and materials, reference is made to the following standard specifications:

- (i) International electro Technical Commission (abbreviated as IEC) publications.
- (ii) British Standards (abbreviated as BS)
- (iii) Bureau of Indian Standards (abbreviated as IS)

Tenderers may, however, offer equipment in accordance with the appropriate national standard specifications of the country of manufacture, but such offers will be treated as deviations and should be quoted for in the manner specified in Para 1.1.7 (d) English rendering of the text and illustrations of the national standard specifications and explanatory notes on the specific deviations from IEC, British Bureau of Indian Standard in question, shall also be submitted in form-3. In case of doubt, the Purchaser shall decide the clause and specification applicable and the contents of the specification and standard mentioned above shall guide such decisions.

## 3. TECHNICAL SPECIFICATIONS

The following specifications/RDSO drawings/Guide lines & latest (as per version available as on date issue of LOA) will govern the supply and testing of important materials, components and equipment's: -

Structural Steel	IS: 2062-1992(IS 2062:2011)
	IS: 800-1984(IS 800:2007)
	IS: 808-1989(IS 808:2021)
Tensile Testing	IS:1731-1989(IS 1730:1989)
	IS:2004-1991(IS 2004:1991)
	IS:1608-1972 For steel products etc. (IS 1608(part1):2018)
Welding	IS:816-1969 (IS 816:1969)
Dropper Wire	IS:282-1982 (IS 282:1982)
Annealed Copper jumper Wire -1):1988)	IS:9968 (PT.I):1981 (IS 9968 (PART -1):1988)
Al. jumper wire	IS:694-1990 (IS 604:1990 )
Aluminum conductor	IS:398 (PT.I)-1976 (IS 398(PART 2):1996)
Material for Aluminum tubular busbar	IS:5082-1981 (IS 5082:1998)
Dimensions for Aluminum Tubular Busbar	IS:2673-1979 (IS 2673:1979)



Galvannised stay strand	IS:2141-1992 (IS 2141:2000)
PVC insulated cables	IS:1554(Part-I)1988
Tin bronze castings	IS:306-1983
Aluminum bronze castings	IS:3091-1965 (IS 3091:1999)
Gray iron castings	IS:210-1978 (IS 210:2009)
Aluminum castings	IS:617-1975 (IS 617:1994)
Copper strip for formed fittings	IS:1897-1983 (IS 1897:2008)
Cadmium copper conductor for overhead Rly. Traction (ETI/OHE/50 (6/97) with A&C Slip 1 to 5)	ETI/OHE/50(6/97) with A&C slip No.1 to 3 of (4/09) or latest.
Copper Busbar	RE/30/OHE/5(11/60) or latest.
Steel tubes	ETI/OHE/11(5/89) or latest
Hot dip galvanisation of steel masts (Rolled and fabricated) tubes and fittings used on 25 KV A.C. OHE.	ETI/OHE/13(4/84) with A&C slip No.1 of (5/86) 2 of (4/90) & 3 of (4/90) or latest.
Stainless steel wire ropes	TI/SPC/OHE/WR/1060(06/06) or latest
25 KV solid core insulator. latest (TI/SPC/OHE/INS/0070 (Latest Rev.)	TI/SPC/OHE/INSCOM/1070(01/07) or
For polluted zones (Composite)	(TI/SPC/OHE/INSCOM/1072(11/2022) or latest)
25 KV single and double pole isolator.	ETI/OHE/16(1/94) or latest
Steel and stainless steel Bolts, Nuts and washer.	TI/SPC/OHE/ FASTENERS/0120(03/13) or latest.
Aluminium Alloy Section and tube.	ETI/OHE/21 (9/74) or latest.
Enamelled steel plates	ETI/OHE/33 (8/85) or latest
Galvanised steel wire	ETI/OHE/36 (12/73) with A&C slip No.1 of (5/98) or latest. (same)
Fittings for 25 KV 50 Hz AC traction equipment. 3 of (10/2010) or latest.	ETI/OHE/49 (9/95) with A&C slip No.1 of (6/97) & 2 of (4/2000)-CORE-1&
25 KV AC 50 Hz Single pole outdoor Vacuum Interrupter.	ETI/PSI/159/(10/94) slip no.1 (3/95) or latest. (TI/SPC/PSI/ISOPN/0100

(Latest Rev.))

25 KV Potential Transformer	TI/SPC/PSI/PT/0990 or latest. (same)
25 KV drop out fuse switch & operating pole for use with 10 KVA	ETI/PSI/14 (1/86) with A&C slip No. 1 of (4/87) or latest. (same)
25 KV/230 V LT supply transformer	ETI/PSI/15(8/2003) or latest.
25 KV/240 V, 10 KVA LT supply Transformer	ETI/PSI/15(8/2003) or latest.
Metal Oxide Gapless Type Lightning (Arrestor use on 25 KV side or latest)	TI/SPC/PSI/MOGTLA/0100 or latest.
3-pulley type Regulating equipment (3:1) slip No.1 & 2 91/2013 or latest.	TI/SPC/OHE/ATD/0060(8/06) with A&C
110 V 40 AH battery charger	ETI/PSI/1 (6/81) or latest.
Bimetallic (Al-Cu) strip	ETI/OHE/55 (4/90) or latest

4. Railway board letter No. 2021/CE-I/CT/SI/1, dtd 04.03.2021 for improvement of quality in construction works shall be applicable and compliance of this letter shall be done strictly and to be submitted before CRS/PCEE inspection. Details of checklist and letters are attached with Tender.

### 3 Galvanization of all steel outdoor works.

- 1 Steel structure for outdoor, TSS, SSP, AT (if any), SP/SSP's and those required for support of Overhead equipments, all small part steelworks (SPS) shall be hot deep galvanized as per

S.N.	Items	Zinc Coating for all areas of WR
1	Steel Structure, SPS and other galvanized items with more than 5mm thickness	1000 gm/sqm
2	Structural tubes	800 gm/sqm
3	All Traction bonds	750 gm/sqm

RDOS's specifications no. ETI/OHE/13 (4/84) A&C-4 or latest. For all regions in WR (unless otherwise stated) the uniform zinc coating shall be adopted as under:

### 4 NOMENCLATURE AND MARKING

- (a) All components and fittings supplied by the Contractor's shall bear the respective identification number and a mark to identify the source of supply except in the case of galvanized tubes, bolts & nuts and/or any other fittings as may be agreed to by the Purchaser.
- (b) In case of insulators, galvanized steel tubes, stainless steel wire rope and conductors, name of manufacturer shall be specified in "As Erected" drawings for identification.

## **5 STEEL WORK AND PROTECTION AGAINST RUST**

### **(a) GALVANISING**

All ferrous materials and fittings shall be hot dip galvanized according to the specification ETI/OHE/13 (4/84) with A&C slip No.1 of 5/86, 2 of (4/90) & 3 of (4/90).

### **(b) PAINTING**

Some components or parts may, with the approval of the Purchaser, be protected only by paint and parts so protected shall be given two coats of composite Aluminum primer and two coats of Aluminum paints. The second coat of Aluminum paint shall be applied after erection.

### **(a) RECTIFICATION AT SITE**

In case of modification which would damage the protective coat, repairs to such damage would be allowed only in exceptional circumstance. the part damaged shall be protected in accordance with the method indicated in specification ETI/OHE/12 (4/84) with A&C slip No.1 of (5/86), 2 of (4/90) & 3 of (4/90) or any other method approved by the Purchaser. The contractor shall in all such obtain prior permission from the Purchaser before carrying out repairs.

## **6 BRACKET ASSEMBLY COMPONENTS**

### **(a) BRACKET**

Bracket tubes shall be of seamless cold drawn or electric resistance weld steel complying with ETI/OHE/11 (5/89) with an insulator near the support. The length of the tubes shall be such that their use a free length of about 200 mm beyond the catenary suspension bracket. To facilitate adjustment during track maintenance.

### **(b) TUBULAR STAY ARM**

Steel tubes with adjustable steel rods shall be used for tubular stay arm of all bracket's assemblies.

### **(c) REGISTER ARM**

The register arm shall also be electrical resistance weld or cold drawn steel tubes or proper dimensions duly formed. It shall be suspended by a dropper from the catenary suspension clamp/bracket tube. A hook and eye arrangement shall be used at the bracket end to permit free movement in every direction.

### **(d) STEADY ARM**

Steady arm shall normally be fitted in all assembly for overhead equipment in running. The steady arm shall be of light alloy BFB section arranged to work always in tension in accordance with ETI/OHE/21(9/74). Steady arms of secondary tracks may be off solid galvanized steel rodding.

The contact wire shall be fixed by a simple swivel clip without threaded parts. Steady arms shall normally be 1.0 m long but for special locations such as turnouts, diamond crossing etc.

## **7 DROPPERS**

### **(a) GENERALS DESIGNS**

The droppers shall generally be designed as shown in standard drawings and made of copper wire about 5 mm diameter conforming to IS: 282:1982 and shall be attached to the catenary wire by a copper dropper clip. the contact wire shall be held by a clip of aluminium bronze

as shown in the standard drawings. The distribution of dropper shall be in accordance with standard design.

(b) LOADING

The droppers shall be able to withstand a vertical load of 200 kg at the point of attachment to the contact wire and the clip shall not slide under a horizontal load of 120 Kgf.

The permissible tolerance in the overall length of a dropper will be +/- 5 mm.

## 8 INSULATORS

- (a) All insulators except those on return conductors and earth wires shall be of the solid core type. Disc insulators shall be used on return conductors and earth wires or other locations as desired by the Purchaser. All solid core insulators shall conform to TI/SPC/OHE/INS/0070(04/07). Before erection all types of insulators to be tested jointly with open line staff.

(b) INTER-CHANGEABILITY

For free inter-changeability, only the following types of insulators shall be used. While the shapes of the insulators may vary slightly from those shown in the drawings, the essential dimension of the galvanized malleable cast iron caps as given in standard drawings shall be adopted.

- (i) **Stay arm Insulators** : These insulators will be used in connection with the tubular stay arm of all bracket assemblies.
- (ii) **Bracket Insulators** : These will be used at the base of each bracket assembly in conjunction with bracket tubes.
- (iii) **9-Tonne Insulators** : These will be used at all places for cut-in and terminal insulation including those in return conductors, but excluding those in earth wire.
- (iv) **Solid core post Insulators** : These will be used at all places for supporting isolators mechanisms, bus-bars, jumpers etc of 25 KV

## 9 ENDING FITTINGS AND SPLICE

(a) GENERAL DESIGNS

Terminating or ending fittings and splices on copper conductor shall be of the cone type clamping on both the inner and outer strands of conductor except for contact wire ending clamps which may be wedge type. The arrangement shall be easy to install and also be such as would apply the clamping pressure gradually without shock (See ETI/OHE/49 (9/95) with A&C slip No.1 of (3/97), 2 of (10/10) for aluminum Alloy/conductor, the end fittings shall be either cone type, strain clamp type or any other type as approved by the Purchaser.

(b) LOADING

All the parts shall be capable of withstanding without damage, a load greater than the ultimate strength of the wires to which they are fitted. In the case of thread, no damage shall occur when they are subjected to a load equal to two third of the ultimate strength of the wires.

(c) STRENGTH OF ASSEMBLED FITTINGS

The strength of fittings assembled with appropriate conductors or wire shall be not less than that of the conductor or wire itself.

(d) ADDITIONAL TERMINATING WIRES

Cadmium copper stranded wire of 65 sq mm nominal section or 37/2.1 mm (as used head span construction) may be used as additional terminating wires for extending single and double conductors respectively, if termination at the nearest structure is not feasible.

## **10 ELECTRICAL CONNECTIONS FOR OHE**

### **(a) GENERAL DESIGNS**

All electrical connections between conductors shall be made by parallel clamps. The general arrangement of connections is as shown in the standard drawings. Further, latest HQ Guidelines including TC-127 (placed at annexure-I) shall be followed wherever applicable. Provision of Large-size modified double bolted PG clamps at all G-jumper connections to ensure better electrical continuity and mechanical strength (As per Annexure-I). Further, Provision of Three (03) PG clamps, instead of two (02) on G-jumpers, F jumper, ATJ Jumpers and isolator jumpers) to ensure firm connections and Provision of Double G-Jumper at the first Sub-sector to enhance current carrying reliability (as per Annexure-I).

### **(b) JUMPERS**

Copper jumpers shall be of any of the followings:

- (i) Large jumpers of annealed copper in accordance with specification ETI/OHE/3 (2/94) with A&C slip No.1 of (4/95).
- (ii) Small jumper of annealed copper in accordance with the specification IS:9968(PT:2)-1981. Aluminium jumpers wherever used, shall be of all Aluminium stranded conductor 19/7/1.4 mm bare 3/4.11 H generally conforming to IS:8130:1984.

### **(c) FEEDERS**

Feeders shall be of all 37/2.25mm HDBC (150sq.mm)

## **11 TERMINAL CONNECTORS FOR EQUIPMENTS**

Interrupter and L.T. Supply Transformer shall be supplied by the Contractor along with the terminal connectors suitable for taking jumper/bus-bar as required including ALCU strips for bimetallic connections wherever required. The ALCU strips required for the connection of Booster Transformers shall also be provided by the Contractor.

## **12 REGULATING EQUIPMENT**

### **(a) GENERAL**

The regulating equipment should have a minimum adjustment range of 950 mm. Stainless steel wire rope in accordance with TI/SPC/OHE/WR/1060(06/06 A&C slip No.1 of (5/07) shall be used in these equipments and these shall be sufficiently.

### **(b) COUNTER WEIGHT**

Counter weights and arrangements used shall be such that these could be accommodated within 330 mm (13 inches) measured transverse to the track under the worst conditions of wind. The vertical upward movement shall be limited with affixed top.

### **(c) REDUCTION RATIO**

Reduction ratio in the arrangement used shall be five for winch type and three in case of three pulley type.

## **13 HEADSPAN CONSTRUCTION**

### **(a) SIZE AND FACTORS OF SAFETY**

All span wires used in head-span construction shall be of stranded cadmium copper conductor 65 sq mm or 130 sq mm cross section. All the wires shall be designed with a factor of safety of not

less than 4 under the most un-favourable conditions.

(b) TURN BUCKLES

Each span wire shall be equipped with a turn buckle at each end of the span.

(c) ADDITIONAL INSULATORS

Additional insulators shall be provided as necessary in head span, cross span and stay span, wires to ensure electrical independence between the equipment in different elementary electrical sections.

**14 ISOLATORS**

25 KV Isolators switches shall comply with specifications as indicated in para 2.4.9.

**15 INSULATION LEVEL**

Interrupters, Potential Transformers line indication type, 42 KV Lightning Arrestors and other equipments shall be suitable for insulation levels indicated in the relevant specifications.

**16 BUSBARS**

(a) No splicing will normally be allowed in the tubular bus-bar unless the length of the bus-bar exceeds 6m.

(b) GENERAL

The bus-bar shall be clean, smooth, mechanically sound and free from surface and other defects. Provisions shall be made where necessary to allow for expansion and contraction of bus-bars caused by temperature variation. The open ends of bus-bars shall be covered by suitable tube caps, wherever the tubular bus-bars are required to be bent, the radius of the bend shall be not less than 200 mm.

JOINTS

(c) The joints in bus-bars shall be mechanically and electrically sound so that the temperature under normal working condition does not exceed 40-degree C for an ambient temperature of 65-degree C.

(d) All Aluminium joints shall be thoroughly cleaned and smeared with suitable oxidation inhibiting joint compound before and after assembling the joint similar procedure shall be followed for connecting the equipment terminals to the Aluminium bus-bars with bi-metallic connectors.

**17 CABLING**

(a) CABLE FOR L.T. SUPPLY

240 V A.C. supply from L.T. supply transformer at switching stations shall be brought and terminated on the I.T.A.C. distribution board in the remote-control cubicles at the switching stations by 1100 Volt 25 sq. mm. aluminium two-core PVC insulated PVC sheathed and steel armoured heavy-duty cable conforming to IS:1554 (Part-I):1998.

(b) CONTROL AND INDICATIONS CIRCUITS

All other cables for control and indication at switching stations shall be 110 V grade PVC insulated and sheathed un-armoured (heavy duty) complying with IS:1554 (Part-I)-1988. The cables shall be provided as indicated in the Table below: -

Purpose	Run	Circuit Voltage	Core size &Material	No. OF CORES
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<b>Control and Indication of interrupters.</b>	<b>From each Interrupter to terminal board</b>	<b>110V/D.C</b>	<b>2.5 sq. mm copper</b>	<b>7</b>
<b>Catenary indication</b>	<b>From each PT line indication type to terminal Board.</b>	<b>100 V/ A.C</b>	<b>-- do --</b>	<b>2</b>
<b>Heater supply for interrupter control mechanism cabinet.</b>	<b>i) From interrupter to interrupter</b>	<b>240 V/ A.C</b>	<b>4.0 sq. mm Aluminium</b>	<b>2</b>
	<b>ii) From each interrupter to fuse box.</b>	<b>-- do --</b>	<b>-- do --</b>	<b>2</b>
	<b>iii) From fuse box to distribution Board.</b>	<b>-- do --</b>	<b>-- do --</b>	<b>2</b>
<b>Battery supply 110 V</b>	<b>i)110 V Battery charger to Battery.</b>	<b>110V D.C</b>	<b>2.5 sq. mm copper</b>	<b>2</b>
	<b>ii)110 V Battery to D.C. fuse box.</b>	<b>-- do --</b>	<b>-- do --</b>	<b>2</b>
	<b>iii)15 A DC fuse box to terminal board.</b>	<b>-- do --</b>	<b>-- do --</b>	<b>2</b>

(c) SPECIFICATION

The cables shall be resistance to delay, abrasion, acids, alkalis and other corrosive materials. All indoor wiring on walls shall be clamped neatly on teak wood battens fixed to the wall by means of wall plugs/wooden pegs. The cable run layout at typical switching stations is shown in the relevant drawing.

**18 LITERATURE FOR EQUIPMENT**

The Contractor shall within six months of issue of Letter of Acceptance of Tender, supply 25 copies of detailed schedule, catalogues and drawings of all parts of the equipment.

*Note: - Contractor shall ensure that Material source and material are approved by Authority Engineer before commencement of work. Also, contractor/s should ensure & submit separate Design mix with the change in source of cement and aggregate.*

**1.3.2 DESCRIPTION OF SCOPE OF EACH ITEM AND ITS MEANING:**

**PART-I: FOR ELECTRICAL-TRD (OHE & PSI) ITEMS:**

***Concrete for foundation and plinth in all type of soil including hard/rocky soil (including excavation and supply of all materials):***

*The scope shall include all works mentioned in all classes of soil, concrete or, masonry/drains/walls and rock. The scope shall also include the cost of digging, cement concrete & soil refilling. The scope shall be same for any shape and size of concrete blocks for foundation, in calculating the individual volume of concrete, fraction of a cubic meter beyond the third decimal shall be rounded off to the next nearest third decimal. The scope shall apply for concreting of all foundations for masts, gantries, portals, anchor blocks for guy rods and fencing uprights. For purposes of computation of volume of concrete, the volume of steel work embedded in the foundation block and muff shall be ignored. For purposes of compilation of volume of concrete, the volume of concrete shall include the volume of sand and bitumen in sand core foundation. For purposes of compilation of volume of concrete, the volume of each muff for all masts shall be taken as 0.02 cum., except for*

masts with balance weights and for column of portal, each head span masts, 2 or 3 track cantilever masts and special fabricated masts for which the volume of muff shall be taken as 0.08 cum. irrespective of the size and shape of muff on a flat basis. Mixture for casting of foundation shall be 1:3:6 and mixture for grouting shall be 1:2:4. Curing of foundation shall be done by contractor for 28 days. No scroll will be supplied by Railway; contractor will use his scroll. Necessary details like, type, implantation, chainage shall be approved by Railway. Contractor has to prepare standard cube of size 150x150x150mm for every 25 cum of foundation cast & is to be tested in the Govt. approved laboratory as per IS-516/1959(or Latest) to obtain the result as per IS 456/1978. Cement used shall confirm to IS 12269 - 1987 or latest, & grade 53, with preferred makes: ACC, ULTRATECH, VIKRAM, SHREE CEMENT, AMBUJA, JAYPEE CEMENT, CENTURY CEMENT, WONDER CEMENT & J.K. CEMENT. In case the tenderer is required to use cement of any other make, prior approval shall be mandatory. The scope also covers smooth plasters on exposed foundation and muff.

#### **Reinforced Concrete for foundation and cable trench**

The scope shall cover excavation and all reinforced concrete work for foundation including supply of steel for reinforcement and other materials Including bending /Binding laying of reinforcement shoring and shuttering where necessary, costing concrete including frame work where necessary, grouting and finishing the tops of foundation blocks with the required slope/muff. The scope shall include dismantling of all connected temporary arrangement back filling as required and removal of soil. The scope shall also cover all concrete work for cost in situ piles and pedestals /columns for mounting equipment. The volume of cast-in-situ piles and pedestals columns shall be added of the volume of foundation block for purposes of payment; Dowel bars will not be considered as reinforcement for the purpose of this item. The scope shall include the cement also. Cement will not be supplied by Rlys. The scope shall include paint with distemper on exposed portion of foundation. The scope also covers smooth plastering on exposed portion of foundation. Cement shall be used of OPC& 53 grade and of popular brand.

#### **Reinforcement concrete for Cable trench cover**

The scope shall cover costing of cable trench covers in reinforced concrete as per drawing. The cable trench covers will be cashed in on angle iron frame of angle size 40x40x5. The scope shall include the supply of steel for reinforcement angle iron for the frame work fabrication of angle iron frame etc. The scope shall include Positioning and dressing up of the trench covers, if required. The scope shall include the cost of cement, ballast and sand also. Cement will not be supplied by Rlys. Cement shall be used of 53 grade and of popular brand. Curing of concrete shall be carried out for 28 Days.

#### **Supply, spreading and levelling of 30mm downgraded ballast, padding 150mm**

The scope shall cover supply and spreading of uniformly graded gravel/ballast of size 30 mm, in the outdoor switch yard after completing all the works and levelling the switch yard area, but before commissioning of the sub-station. The gravel/ballast shall be of good quality and free from any dust and dirt. Prior approval of ballast shall be taken from the Purchaser for the gravel samples. The gravel/ballast shall be spread out uniformly to a depth of 15cm. over the area indicated by the Purchaser's Engineer.

#### **Supply, erection of rolled or fabricated and galvanized traction mast, TTC, Portal with boom and AT masts, Feeder mast etc.**

Supply, erection of traction main masts of OHE comprising rolled, broad flanged beams, fabricated K-series, B series, portal upright, boom pieces & associated fittings, D.A., extension chairs and AT Masts, feeder mast, bridge mast etc.

1. The scope shall cover the supply, fabrication, galvanization, erection, alignment and setting before grouting of individual tractions masts.

2. Galvanization thickness shall be of 1000 gram per sq. meter, and the procedure shall be as per Railway Specification No. ETI/OHE/13(4/84) with a.c.s. No.4 dtd. 05/2018 (or latest).



3. In case, required size of channels are not available as per approved drawing, higher size of channels can be used with approval of Dy. Chief Electrical Engineer (construction) and payment as per actual black weight will be paid.
4. The scope shall also include the straightening of masts/portal uprights etc. bent during transit and cutting of masts/portal uprights to suit the site condition.
5. 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 for payment.
6. However in case the unit sectional weight of any member indicated in RDSO's drawing is not in conformity with the unit sectional weight as per the latest IS specification the weight of the fabricated steel work shall be calculated on the basis of latest IS specification and the same will be considered for payment for the nonstandard fabricated steel work, the calculated weight to be considered for payment under this item shall be included in the relevant drawing based on latest IS sectional weight at the time of submitting the designs for approval of the purchaser.
7. There will be no addition for increased weight due to galvanizing or painting or reduction for holes or screw cut.
8. Galvanization damaged during transportation/ carting will be touch up with cold ZINC paints by tenderer.
9. Materials will be supplied at site of work.
10. Payable unit weights for standard mast.
11. It Should Be Insured That Only Forged Fitting Will Be Used at The Place of MCI (Malleable Cast Iron) Fittings as Per HQ -TC No. 84 & 89.
12. The scope shall also include the cost of stencilling of location number, height of contact wire, implantation, R.L. etc on masts/portal uprights in the manner as directed by purchaser
13. Provision Of Spare OHE Mast Foundation on Bridge Peir & Spare Bridge Mast Shall Be Made as Per Railway Guidelines Letter No. 2022/EEM/148/4/IRSOD Dated 10.09.2025.

Sr.No.	Type of mast	Weight in Kg/m incl. galvanization	Sr.No.	Type of mast	Weight in Kg/m incl. galvanization
1	6"x6"x25.15 BFB	38.03	14	K-150	38.18
2	162x154x27.1 BFB	38.00	15	K-175	43.72
3	200x200x49.9 BFB	51.20	16	K-200	49.87
4	8"x6"x35 RSJ	53.39	17	K-225	57.50
5	S-1	53.30	18	K-250	66.72
6	S-3	76.40	19	B-100	27.71
7	S-4	53.39	20	B-125	32.47
8	S-5	111.53	21	B-150	39.07
9	S-6	53.39	22	B-175	44.61
10	S-7	76.40	23	B-200	50.76
11	S-8	111.53	24	B-225	61.50

12	K-100	23.70	25	B-250	70.72
13	K-125	30.30	26	S-100	23.72

Civil work for electrification/OHE work of Tunnel

This scope includes the drilling of 35 mm holes with depth should not be less than of 300mm for both top fitting and bottom fitting of cantilever along with all the fittings and accessories as per RDSO drg. No. TI/DRG/CIV/Tunnel anchor bolt/00001/18/0 dtd. 27.02.2018 also includes Drawings No. KR/RE/EL/Tunnel/ROHA-VEN/02 to 06 (or as per instruction of Engineer in charge) and number plate hole size will be 20mm dia with depth of 100mm with Material of the bolt shall conform to Fe-415 of IS:1786/1985 and mechanical Properties of the bolts shall confirm p property class-4.6 as specified in IS:1367 or latest: with zinc coating of minimum 610 gms./sq.m.as per RDSO specification No.ETI/OHE/13/(4/84) with A&C slip no.1of (5/86),2 of(4/90) & 3 of (4/90),to be procured from CORE approved suppliers. The scope also include the supply of 20mm x 600mm galvanized steel rag bolts with threaded portion hot dip galvanized up to 200 mm along with all required fittings and accessories as per RDSO drg no.TI/DRG/CIV/TUNNEL Anchor Bolt/00001/18/0 dtd 27.02.20218.

The scope shall include Fabrication & supply of various galvanized steel items (others than RDSO standard OHE fittings) as per Drawing (or as per instruction of Engineer In-charge), for supporting the fabricated fitting including galvanizing, for supporting the OHE inside the tunnel. The steel items shall be as per IS: 2062-2006, IS: 1730-1989 and RDSO Spec. No.ETI/OHE/49(9/95) with A&C Slip No.1-5. The fittings shall be galvanized as per RDSO specification No. ETI/OHE/13(4/84) with A&C slip No.1 of (5/86), 2 of (4/90) & 3 of (4/90) and shall be procured from CORE approved suppliers only.

1.	TEST PARAMETER	TEST METHOD	RECOMMENDED VALUE	
A	Colour index	ISO 4630	0-3	0-2
B	Epoxy Index	ISO 3001	5.2-5.5	
C	Viscosity@25 deg. C(mPas)	ISO 12058	500-600	
D	Viscosity@75 deg. C(mPas)	ISO 2555		300-600
E	Amine Value (mg of KOH/gm)	ISO 9702		370-410
2.	MIX PROPORTION FOR EPOXY GROUTING			
a.	Epoxy Resin (in Araldite Gy 257) Hardener (Aradur 140)	100 Parts by Weight		
b.	Hardener (Aradure 140)	50 Parts by Weight		
c.	Filler (Silica/Quartz sand)	400-500 Parts by Weight (Variable to suit the consistency required)		
3.	The Bond stress with M15 concrete will be minimum 6 Kg/cm			

Load testing calculation shall be submitted with proper proof checking as per relevant standard and procedure and shall be approved by railway officials before execution at site.

***Supply and erection of fabricated and galvanized steel works other than traction mast, TTC, portals etc. (SPS)***

*The scope shall cover the supply and erection of SPS for different type of masts, portals, DA, isolator, boom. Payment of SPS will be made as per black steel weight of material as per RDSO/CORE latest approved drawings and supplier.*

*1.The scope shall cover fabrication, galvanization, supply, erection and assembling of all the SPS items.*

*2.Galvanization thickness shall be of 1000 gram per sq. meter, and the procedure shall be as per Railway Specification No. ETI/OHE/13(4/84) with a.c.s. No.4 dtd. 05/2018 (or latest).*

*3.In case, required size of channels are not available as per approved drawing, higher size of channels can be used with approval of Dy. Chief Electrical Engineer (construction) and payment as per actual black weight will be paid.*

*4.The scope shall also include the straightening of masts/portal uprights etc bent during transit and cutting of masts/portal uprights to suit the site condition.*

*5.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 for payment.*

*6.However in case the unit sectional weight of any member indicated in RDSO's drawing is not in conformity with the unit sectional weight as per the latest IS specification the weight of the fabricated steel work shall be calculated on the basis of latest IS specification and the same will be considered for payment for the nonstandard fabricated steel work, the calculated weight to be considered for payment under this item shall be included in the relevant drawing based on latest IS sectional weight at the time of submitting the designs for approval of the purchaser.*

*7.There will be no addition for increased weight due to galvanizing or painting or reduction for holes or screw cut.*

*8.Galvanization damaged during transportation/ carting will be touch up with cold ZINC paints by tenderer.*

*9.Materials will be supplied at site of work.*

*10. It Should Be Insured That Only Forged Fitting Will Be Used At The Place Of MCI (Malleable Cast Iron) Fittings As Per HQ -TC No. 84 & 89.*

***Provision of single cantilever assembly complete with insulator for conventional OHE and inside the tunnel.***

*1. The scope shall cover on provision of bracket assembly on a traction mast or Support on drop arm 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.*

*2. The scope shall include the provision of all components including galvanized steel tube duly fabricated, with 800 gm/sqm galvanization thickness and Porcelain insulators 1050/1600 mm CD for polluted Zone (Id. 6000-1, 6030-1) including bolts, nuts etc. if any.*

*3. The scope shall cover provision of all components including registered arm dropper excluding small parts steel work if any.*

*4. This does not include the anti-creep arrangement at masts/structures, however double suspension clamp wherever required shall be included in item.*

*5. Composite insulators shall only be used in polluted Zone and stone pelting areas with prior approval of Dy.CEE/C/RTM.*

*6. The scope also covers testing of insulator (ST/BT/9T) as per latest guidelines, with Hydraulic insulator testing machine. Calibrated Insulator testing machine shall be arranged by contractor.*

*7. All Components shall have complied Latest RDSO/CORE specification.*

*(Note: Forge type fittings shall be used instead of MCI wherever applicable.)*

*8. The scope shall also cover the Packing Saddle (1174) as per SPEC:*

TI/SPC/OHE/FITTINGS/0130-10/13-Rev-1, DRW: RE 33 P 1174, modified drawing of suspension n clamp (Drg. No. RE/33/P/1160 Rev K) as mandated vide RDSO MI no. TI/MI/0059 dtd. 05.09.2024.

9. The scope shall contain of double composite insulators in place of single ST and BT insulators at polluted area in order to avoid/minimise insulator flashing and bird fault cases.

10. The scope shall include double inclined droppers throughout the entire section in all the cantilevers to improve mechanical stability of contact wire.

11. Necessary SED will be required to get approved by Railway for each cantilever.

12. In case the composite insulator required at any location, it should be ensured that double composite ST/BT/9 tonne insulators to be erected at the place of single insulator in order to avoid/minimise insulator flashing and bird fault cases as per HQ TC-127.

Note:-

1. It should be ensured that DA implantation at station at platform should be more than 1.85mtr as per latest RB guideline HQ TC-127.

2. Ensure that 100% testing (joint testing) of insulators before any utilization at site. (as per the latest guidelines- use of only UTM)

#### **Provision of pull-off arrangement for OHE.**

The scope shall cover provision of all components required for a pull-off arrangement to pull OHE equipment, including head span mast fittings complete with M.S. angle equalizing plate assembly steady arm, catenary dropper clip, contact wire swivel clip and fittings, including porcelain 9-ton insulators (1050mm CD) conductors, small jumpers (50 Sq.mm) wire. The scope shall cover erection of all components including composite solid core insulators, small jumper wire and conductors.

Note:-

1. It Should Be Insured That Only Forged Fitting Will Be Used At The Place Of MCI (Malleable Cast Iron) Fittings As Per HQ -TC No. 84 & 89.

2. It should be insured that three (3) PG clamps, instead of two (2) on G-jumper; F jumper; ATJ jumpers and isolator jumpers to ensure firm connections as per latest RB guideline HQ TC- 127.

#### **Provision of guy rod assembly**

1. The scope shall cover provision of guy rod assembly of various lengths for traction masts/portal upright complete with mast guy rod fittings, guy rod with adjustments and parts to be grouted etc in the anchor block including S.P.S.

2. The scope shall not include the provision of dwarf masts.

3. Galvanization shall be based on RDSO specification No. ETI/OHE/13 (4/8) with ACS 1 to 4 ensuring quality of zinc, base metal, surface preparation and galvanizing as per relevant standards as given in above RDSO specification 1000 gm/sqm.,

#### **4. COMPONENTS REQUIREMENTS**

<b>Railway ID No.</b>	<b>Description of components</b>	<b>Qty/unit</b>
3241	Mast Anchor Fitting for cliff type of structure	1 No
3242	Mast guy rod fitting with 4 sets of bolts of 20 mm dia. of suitable length with nuts, Locknuts, washers for attachments to mast/S.P.S. including appropriate fitting	1 No
5001-3	Stud bolts for draft mast (850mm)	2 Nos.
-	Triangular attachment for Dwarf mast	1 No
5002	Guy rod stirrup	1 Set

5004 or 5005 or 5006.1 or 5070-1	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.	1 Set

*Note:*

1. All components should be as per latest Specification with Revision (if any).
2. It Should Be ensured That Only Forged Fitting Will Be Used At The Place Of MCI (Malleable Cast Iron) Fittings As Per HQ -TC No. 84 & 89.

***Provision of regulating equipment 3 pulley type complete with all accessories including counter weight assembly and SS wire rope for conventional OHE.***

The scope shall cover supply of counter weight assembly including 9-Ton adjuster & 9T Porcelain Insulator CD 1050 mm with double strap assembly, and normal/antitheft guide tube assembly including supply of regulating equipment as per RDSO Specification No. TI/SPC/OHE/ATD/0060 Rev.-1 with A&C Slip No.1 or latest and stainless steel wire rope as per Rly Specification No. TI/SPC/OHE/WR/1060(06/2006) With A & C No.1, 2 & 3 or latest suitable for 3 Pulley ATD required for regulating equipment and small parts steel work, if any. The scope shall also cover supply of anti-falling device, anti-climbing (stiffener) Angle on Anchoring and double eye distance rod. The counter weights shall adhere to the instructions as per RDSO's Specification no. ETI/OHE/P/5092/93 Rev.B or latest, including one coat of primer and two coats of aluminium paints. The scope also covers compliance of Latest Technical circular, MI/SMI's, Reliability action plan etc. (if applicable)

This scope shall also cover modification of anti falling arrangement of 3-pulley type ATD as per RDSO modification vide RDSO letter no. TI/OHE/ATD/10 dated 31.05.2010/04.06.2010

*Note:-* only one (01) ATJ jumper in place of three (3) jumpers shall be ensured to simplify the arrangement and improve reliability.

***Spring auto tensioning device for 25 kv AC traction as per RDSO specification no. TI/SPC/OHE/SPRINGATD/0110 Rev 2 or Latest***

The Scope shall include supply, erection, adjustment, testing and commissioning of Spring Auto Tensioning Device (Spring ATD) complete with mounting assembly, stainless steel wire rope, pulleys, bearings, springs, fasteners, fittings and all other supporting structures and accessories required for satisfactory operation of the system, conforming to RDSO Specification No. TI/SPC/OHE/SPRINGATD/0110 Rev.2 or latest.

***Supply and erection of of all types of MS bonds (40 X 6 mm)***

The scope shall include the supply and erection of galvanized structure & other bonds & galvanization shall be based on RDSO specification no. ETI/OHE/13 (4/8) with ACS 1 to 4 ensuring quality of zinc, base metal, surface preparation and galvanizing as per relevant standards as given in above RDSO specification The weight of zinc coating to be adopted is 750g/Cm<sup>2</sup>. The scope shall also include supply of PVC sleeve of approved design for structure under track circuit rail.

It should be ensured that connection of structure bond to rail track circuiting area shall be done as per HQ letter no. EL-94/15/1 ( Comp. no. 677982) dated 17.10.2025

Also, the chamfering of holes in rail for provision of bond shall be ensured.

***Supply and erection of Earth electrode.***

The scope shall cover supply and erection of an earth electrode assembly as per RDSO Specification No. ETI/OHE/P/7021 rev.(A) or latest for OHE, and RDSO Specification No. ETI/PSI/222 rev. 1 or

<p>latest for PSI(SWS)with all accessories &amp; fasteners. The scope also covers the provision of a protective concrete box with removable cover.</p> <p>Note:- It should be ensured that provision of earthing station at SP and SSP -RDSO modification vide RDSO SMI No. TI/SMI/0032 (Rev-2 or latest) as per latest RB guideline HQ TC-127.</p>
<p><b>Supply and erection of galvanized GI flat for earth (50mmx6mm)</b></p> <p>The scope shall include the Provision of galvanized flats &amp; galvanization shall be based on RDSO specification No. ETI/OHE/13 (4/8) with ACS 1 to 4 ensuring quality of zinc, base metal, surface preparation and galvanizing as per relevant standards as given in above RDSO specification The weight of zinc coating to be adopted is 750g/Cm<sup>2</sup>. The scope shall also include supply of PVC sleeve of approved design for structure under track circuit rail.</p> <p>It should be ensured that connection of structure bond to rail track circuiting area shall be done as per HQ letter no. EL-94/15/1 ( Comp. no. 677982) dated 17.10.2025</p> <p>Also the chamfering of holes in rail for provision of bond shall be ensured.</p> <p>Note: 1. The Payment for supply of Schedule Item (B-9) shall be done only after the successful &amp; satisfactory erection of the material under schedule item E11.</p> <p>2. Bonding and earthing of OHE mast for concrete bridges with provision of earth wire /strip and earthing on both side of bridge needs to be provided.</p>
<p><b>Supply and erection of Fencing upright.</b></p> <p>The scope shall cover Supply &amp; Erection of fabricated fencing uprights. The scope shall be on the basis of black weight of the steel section of the approved drawing with no deduction for holes and skew cuts or no increase for weld materials.</p> <p>Note:- It Should Be ensured That Only Forged Fitting Will Be Used At The Place Of MCI (Malleable Cast Iron) Fittings As Per HQ -TC No. 84 &amp; 89.</p>
<p><b>Supply and Erection of fencing panel as per RDSO approved drawing</b></p> <p>The scope shall include supply &amp; erection of GI fencing panels. The scopes shall not include supply of fencing uprights, anti-climbing devices but shall include the fasteners and the scope for a meter length of the panels, measured in the plan view of the approved drawings.</p> <p>Note:- It Should Be ensured That Only Forged Fitting Will Be Used At The Place Of MCI (Malleable Cast Iron) Fittings As Per HQ -TC No. 84 &amp; 89.</p>
<p><b>Supply and erection of Bridge mast Bolt.</b></p> <p>The scope shall include the supply and erection of Bridge mast bolt shall be based on RDSO specification No. TI/SPEC/OHE/FASTENERS/120 REV/1. The scope shall cover the Core cutting at bridge pier block 40mm dia, hole 1000mm gap, and epoxy chemical grouting with minimum bond stress m20 concrete for 20mm bolt. and as per the instructions issued by Engineering.</p> <p>Note: - As per latest RB guideline HQ TC-127, spare bridge pier needs to be provided so as bolts to be supplied as per those piers.</p>
<p><b>Supply and erection of Antibird disc on insulator end fitting.</b></p> <p>The scope shall include supply and erection of Anti disc on ST, BT &amp; 9-ton insulators end fitting as per Drg. No. TI/DRG/OHE/ABD/RDSO/00000/19/0 Rev 1 (Sh 1 &amp; 2), Under RDSO MI No. TI/MI/00059 Rev 3 or latest. The disk shall be made up of polycarbonate of fire flammability rating of V-2 or higher as per UL94, from Group 01, class 2 of latest ASTM D 3935-2, with additional properties as given in SM1.</p>
<p><b>Supply and erection of Anti Monkey climbing device (AMCD) as Monkey Scare for mast.</b></p> <p>The scope shall include supply and erection of fabricated Anti Monkey scare measure for OHE mast at Monkey menace prone area as per RDSO SMI No. TI/MI/0056 Rev-2 or latest. The AMCD shall be barbed wire frame type as per Drg. No. TI/SK/OHE/ANTIMON/RDSO/0001/08/0 given in Annexure 1 or cylindrical arrangement as per Drg. Given in Annexure II. Location and type of AMCD shall be jointly decided by SSE/Elect/Construction and SSE/TrD and approval by Sr DEE/TRD. One sample for each type of OHE mast/Structure is to be fabricated and submitted to concern SSE for approval before utilization at site. Any modification suggested by concern SSE</p>

<i>based on practical implication must be incorporated in the design.</i>
<b><i>Supply and erection of Anti Monkey climbing device as Monkey Scare for Portal.</i></b>
<i>The scope shall include supply, erection and fabrication of Anti Monkey scare measure for OHE Portal/TTC at Monkey menace prone areas as per RDSO SMI No. TI/MI/0056 Rev-2 or latest. The AMCD shall be barbed wire frame type as per Drg. No. TI/SK/OHE/ANTIMON/Rev-2 or latest. The AMCD shall be barbed wire frame type as per Drg. No. TI/SK/OHE/ANTIMON/RDSO/0001/08/0 given in Annexure 1 or cylindrical arrangement as per Drg. Given in Annexure II. Location and type of AMCD shall be jointly decided by SSE/Elect/Construction and SSE/TRD and approval by Sr DEE/TRD. One sample for each type of OHE mast/Structure is to be fabricated and submitted to concern SSE for approval before utilization at site. Any modification suggested by concern SSE based on practical implication must be incorporated in the design. .</i>
<b><i>Supply and erection of nylon/plastic net - High density polyethylene (HDPE) monofilament netting type III, UV stabilized as per IS 16008(part-2)-2016/PVC virgin HDPE Net preferably in black colour.</i></b>
<i>The scope shall include supply and erection of Anti Bird and anti monkey high density poly Ethelene (HDPE) filament netting type III, UV stabilized as per IS 16008 (Part-2)-2016. PVC virgin HDPE net preferably in black colour on fabricated structure, Portal/TTC, Fabricated DA, Gantry boom, etc. as per RDSO MI No. TI/MI/0050 Rev-2 or latest. the scope shall include supply and tying with UV resistant nylon cable tie as per para 4.4 of RDSO SMI. .</i>
<b><i>Supply and erection of 25KV single pole Vacuum interrupter.</i></b>
<i>The scope shall cover supply and erection of 25kV, 1600A Vacuum interrupter, complete with operating mechanism, all fittings, and accessories including terminal connectors as per RDSO Spec. No. TI/SPC/PSI/LVCBIN/0121 (05/23) or latest. The scope shall cover grouting the supporting frame and mechanism box on foundation block and mounting of other accessories in their respective places. It shall also cover, testing and commissioning of the circuit breaker. The scope shall also cover the supply of an enamelled number plate and required quantity of long shackle brass Pad lock (Make - Godrej, Link). The Contractor shall make his own arrangement for power supply requirement for testing purpose. All necessary tools, equipment's instruments required for carrying out necessary checks and tests and commissioning shall be arranged by the Contractor.</i>
<b><i>Supply and Erection of 25 KV double pole, 1600A isolator with interlocking mechanism.</i></b>
<i>The scope shall cover supply &amp; erection of 25KV, 1600A double pole isolator switch of approved make, complete with arcing horns, operating rods, operating rod guides, mounting base (including 25KV pedestal insulators-4Nos and operating rod insulator-2 No), Terminal connectors with bimetallic strip and integral locks. The scope shall also cover supply &amp; erection of long shackle brass Pad lock (Make - Godrej, Link) and a number plate of approved design for each isolator, and also cover supply &amp; erection of copper flexible jumper along with accessories between isolator to OHE and support of operating rods on gantries/mast. The scope shall not include supply of small parts steel work completes with bolts and nuts etc.</i>
<i>Note:- 1. The copper flexible jumper should be of 160 sq. mm with bolt type connector and anti-falling arrangement shall be provided as per latest RB guideline HQ TC-127 dtd. 21.04.2026</i>
<b><i>Supply and erection of 25KV single pole, 1600A isolator.</i></b>
<i>The scope shall cover supply of a 25 KV, 1600A for SP/SSP's (1600A for OHE) Single pole isolator complete (as per RDSO specification No. TI/SPC/PSI/ISOLTR/0210 and RDSO's letter No. TI/PSI/25/ISOL /POLICY /99 dt 3.6.99 or latest), with mounting base (including 25 KV pedestal insulators-2 Nos. and operating rod insulators- 1 Nos.), operating rod and operating rod guides required for the operation of the isolator.</i>
<i>1.The scope shall also cover supply of Al/Cu strips, a 50 mm Brass pad-lock (Make - Godrej, Link), copper jumper for earthing and an Enamelled number plate of approved design for each isolator.</i>

2. The scope also covers cost for 02 no. terminal connector.
3. The scope also covers supply of out-trigger complete assembly (if applicable).
4. The scope work should ensure all the work as per latest RB guideline letter HQ TC-127 dtd. 21.04.2026

**Supply of PTFE short Neutral section.**

The scope shall cover supply of a complete assembly of short neutral section (PTFE) (Phase brake). The scope shall also cover end fitting for contact & catenary wire and other material required for erection & smooth operation with earthing arrangement. 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 is suitable for i.e. 65 sq.mm Catenary and 107 sq.mm contact wires.

Note: -1. It should be ensured that PTFE neutral section in place of insulated overlap of TSS shall be provided.

The work in this scope shall be completed as per latest RB letter no. HQ TC -127 (No EL/TRD/127(10/2014) dated: 06.10.2014).

**Supply and erection of materials for termination of double conductor (including supply of 9t cut-in insulator) of overhead equipment**

The scope shall cover supply and erection of all material necessary for the termination of double conductor of overhead equipment terminating wire on a traction mast or structure including clevis assembly, adjuster, anchor double strap, ending clamp for catenary or contact or terminating wire with fitting and porcelain 9-ton insulator assembly (for polluted zone) equalizing /compensating double strap assembly, as per ETI/OHE/G/03121 MOD-F or latest, but excluding terminating wire if any, wherever double termination is required. It includes all fasteners required for termination. The provision of pipe oh Hex tie rod of ATDs as per RDSO MI No. TI/MI/0035 Rev-1 dt. 28.09.2001 (or latest). The provision on Hex tie rod shall be on ATDs connected on Turnouts, X-over, Neutral sections, other short tension length and tension length with FTA on another end. The length of pipe shall be as per procedure given in RDSO MI. The pipe shall be 20mm dia GI, medium class as per IS 1161-1979 (or latest).

The ending clamp shall be installed correctly following instruction given in the RDSO SMI no. TI/MI/0051 dtd. 08.12.2017 (or Latest).

The scope shall include fluorescent red tape before ending clamp as per RDSO SMI no. TI/MI/0037 Rev-3 and TI/MI/0051 or latest.

Note:- the scope shall ensure that packing of saddle in catenary suspension clamp for prevention of melting / flashing of catenary wire as per RDSO SMI no. TI/MI/0059 Rev-3 or latest.

**Supply and erection of materials for termination of Single conductor including 9T insulator.**

The scope shall cover supply and erection of all material necessary for the termination of Single conductor of overhead equipment terminating wire on a traction mast or structure including clevis assembly, adjuster, anchor double strap, ending clamp for catenary or contact or terminating wire with fitting and porcelain 9-ton insulator assembly (for polluted zone) equalizing /compensating double strap assembly, as per ETI/OHE/G/03121 MOD-F or latest, but excluding terminating wire if any, wherever double termination is required. It includes all fasteners required for termination.

The ending clamp shall be installed correctly following instruction given in RDSO SMI No. TI/MI/0051 dt. 08.12.2017 (latest).

Note: -1. It Should Be ensured That Only Forged Fitting Will Be Used at The Place of MCI (Malleable Cast Iron) Fittings as Per HQ -TC No. 84 & 89. .

**Supply and erection of section insulator assembly including core and cut-in insulator**

The scope shall cover supply and erection of all components required for a standard section insulator assembly on conventional OHE including section insulator assembly (Five parts), also



provide 2 nos., stiffener (contact bar) & other materials as per details given below: All material shall be with latest specifications .

<i>Railway ID No.</i>	<i>Description of component</i>	<i>Qty per unit</i>
<i>RI-1120</i>	<i>Catenary ending clamp</i>	<i>2 Nos.</i>
<i>RI-1190</i>	<i>Catenary dropper clip assembly</i>	<i>As required</i>
<i>RI-6170</i>	<i>Parallel clamp for double contact wire.</i>	<i>12 Nos.</i>
<i>RI-6110</i>	<i>Dropper assembly for Section Insulator.</i>	<i>As required</i>
<i>RI-6100-1</i>	<i>Porcelain section insulator along creepage.</i>	<i>01 No.</i>
<i>RI-6020-1</i>	<i>Porcelain 9-ton insulator</i>	<i>01 No</i>
<i>RI-6181-2</i>	<i>Double straps for section insulator.</i>	<i>02 Nos.</i>

#### **Supply and erection of 25KV solid core cut-in insulator**

The scope shall cover the supply and erection of complete 25 KV solid core long creepage Porcelain cut-in- insulator including Double strap, Catenary wire or contact wire ending cone etc. as per latest RDSO/CORE specification.

The scope shall also cover 100% testing (joint testing) of insulators before providing to the line. (as per the latest guidelines- use of only UTM)

Note: - 1. If there's any location where's we need to use composite type insulator then it should be ensured that double composite insulator to be use at the place of termination of any type of conductor.

It must be ensured that the supply of composite insulator and porcelain insulator as per latest guidelines issued vide letter No. 2002/EEM/161/21/Vol-II, dated: 30.09.2020

#### **Supply and erection of 25KV solid core suspension insulator.**

The scope shall cover the supply and erection of complete 25 KV solid core long creepage Porcelain suspension insulator assembly including Double strap, single eye clevis, suspension clamp etc. as per latest RDSO/CORE specification and drawings.

The scope shall also cover 100% testing (joint testing) of insulators before providing to the line. (as per the latest guidelines- use of only UTM) also it shall be ensured that double composite insulators at termination locations in platform area to enhance reliability and safety , anticreep , FTAs, etc.

Note:- 1. If there's any location where's we need to use composite type insulator then it should be ensured that double composite insulator to be use at the place of termination of any type of conductor.

#### **Supply and erection of 25KV Post/Support insulator.**

The scope shall cover the supply and erection 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.

The scope shall also cover 100% testing (joint testing) of insulators before providing to the line. (as per the latest guidelines- use of only UTM)

#### **Supply and erection of 10 KVA Change over panel as per RDSO spec. suitable for 10 KVA AT supply.**

The scope shall cover the supply, erection, testing and commissioning of Change over panel as per RDSO specification No. 0TI/SPC/PSI/CLS/0020(12/02) (with A&C slip No. 1 to 4) or latest and suitable for 10 KVA/25KVA AT Supply. The scope also covers Type-1 Box, any relay, fittings, Glands, fasteners, Lugs etc. for commissioning of panel and smooth working.

#### **Supply and erection of terminal board in control cubicle.**

The scope shall cover the supply and erection of terminal board for 230V AC supply to Interrupters in switching post control cubicle as per RDSO/CORE latest drawings and specifications.

#### **Supply and erection of 110V DC distribution board.**

The scope shall cover supply and erection of a 110V DC distribution board in the control room as

<i>per RDSO/CORE Specification No. <b>ETI/PSI/29 (12/79) Rev-1 (Feb'93) or latest</b> and from approved make.</i>
<b>Supply and erection of 230V AC distribution board.</b>
<i>The scope shall cover supply and erection of a 230V AC distribution board in the Control Room for SP/SSP/TSS as per RDSO/CORE Specification No. <b>ETI/PSI/29 (12/79) Rev-1 (Feb'93) or latest</b> and from approved make.</i>
<b>Supply and erection of PT Type-I</b>
<i>The scope shall cover supply, erection, testing and commissioning of a 27.5 kV/100V potential transformer complete with all fittings and accessories including terminal connector as per RDSO spec. No. TI/SPC/PSI/ PT/0210 with A&amp;C slip No.1 to 5 <b>or latest</b>. It shall also include supply of an enamelled Number plate &amp; connectors with jumper and the equipment for checking any type of transformer losses while doing testing will be supplied by contractor with the approval of railway official.</i>
<i>Note: - It shall be ensured that PT on HT side of transformer for voltage indication shall be ensured as per latest RDSO modification. .</i>
<b>Supply of 110V lead acid battery charger</b>
<i>The scope shall cover supply of a 110V, 200 AH(TSS) &amp; 40AH(SP/SSP) low maintenance lead acid battery complete as per RDSO/ CORE specification No. RDSO/PE/SPEC/TL/0040-2003 (Rev-0) with Amendment No.1 or latest with stand and accessories as mentioned in relevant specification and a tool board. The Battery bank for SP/SSP shall also conform to the RDSO letter no. RDSO-TI0LKO(PSI)/53/2020 dtd. 17/03/2022.</i>
<i>Note :- It shall be ensured that battery monitoring relay at TSS shall comply with RDSO letter No. TI/PSI/PROCT/STATC/12 dtd. 01/05.03.2013 &amp; 08/12.03.2013.</i>
<b>Supply of 110V, 40AH lead acid battery</b>
<i>The scope shall cover supply of a battery charger for 110V, 200 AH(TSS) &amp; 40AH(SP/SSP) low maintenance lead acid battery complete as per RDSO specification No. TI/SPC/PSI/200-250/CHGR/0210 (07/2021) or latest with stand and accessories as mentioned in relevant specification and from approved vendor.</i>
<i>Note:- The scope shall ensured the latest HQ guidelines of letter no. HQ TC-127.</i>
<b>Supply and erection of Auxiliary Transformer 25 kV/230 V, 10 KVA with DO fuse assembly, LV box &amp; Anti climbing device.</b>
<i>The scope shall cover the supply of Auxiliary Transformer 25 kV/230 V, 25 KVA as per RDSO specification No. ETI/PSI/15 (8 /03) or latest with 25 KV DO fuse complete assembly including insulators as per RDSO Specification No. ETI/ PSI/14(1/86) Rev 1 (Apr-87), LV box for AT &amp; Anti climbing device complete including barbed wires etc. the scope also cover the Clamps, lugs, Name Plate 9-ton insulator arching horn as per RDSO letter no. (TI/PSI/AT/POLICY/10 dtd. 20/31.02.2010.) etc.</i>
<i>The scope shall cover the erection of cable route markers and cable route plan shall be provided as per latest RB guidelines HQ TC-127.</i>
<i>Note:- Duplicate/ standby cable for auxiliary transformer shall be ensured.</i>
<b>Supply and erection of Lightning arrestor for 25 KV OHE.</b>
<i>The scope shall cover supply and erection of a 42kV Lightning Arrestor complete with all fittings and accessories including terminal connector, surge monitor, an enamelled number plate and disconnector assembly as per RDSO spec. No. TI/SPC/ PSI/MOGTLA/ 0101 (02/2015) and RDSO SMI No. TI/SMI/0048 Rev-2 or latest .)</i>
<b>Supply and Erection of Station Equipment's at SP/SSP as per RDSO Spec. No. TI/RCC/ SCADA/0134 or Latest) with A&amp;C slip no.1 with amendments</b>
<i>The scope covers design, supply, erection, testing and commissioning of Standard Supervisory Control and Data Acquisition (SCADA) equipment as per <b>RDSO Specification No.</b></i>

<p><b>TI/SPC/RCC/SCADA/0134 or latest</b> with latest amendments in the proposed section. The, scope of the work also covers supply of SCADA system at RCC, SCADA software, SCADA equipment at controlled stations, Low maintenance batteries at RCC, Dual UPS (W/o Batteries) at RCC, Modular Furniture at RCC for work stations, GPS receiver, Web server for Railway SLDC/SLDC and supervision of operation and maintenance of the SCADA system, as per specification. Comprehensive maintenance (preventive maintenance and break down attention) contract of SCADA system for 04 years after expiry of 36 months guarantee period as per tender paper for control of Traction Sub -Stations and Switching Stations for 25 kV A.C. Single phase, 50 C/S, Electric Traction of electrified section. Comprehensive maintenance covers maintenance of SCADA system complete with all software, RCC equipment, RTUs including replacement of defective parts and accessories or up gradation of SCADA systems, software &amp; RTUs etc. during the currency of contract as mentioned in the Specifications. SCADA site, if required, may be shifted to other suitable locations as per site condition.</p> <p>The control and relay panels shall comply with latest directives of RDSO letter No. TI/PSI/PROCT/STATC/12 dt. 01/05.03.2013 &amp; 08/12.03.2013 or latest.</p>
<p><b>Supply and erection of 50/39 mm aluminium bus bar.</b></p> <p>The scope shall cover supply of 50 x 39 mm Dia Al. bus bar confirming to IS-5082 (Aluminium Alloy to grade in WP condition) and 28 IS-2673 (Accuracy Class) and from RDSO approved source only. The scope shall cover Supply, erection, testing &amp; commissioning of per metre length of 50 x 39mm dia. Aluminium tube to serve as bus bar or equipment to equipment bus bar connection in the traction sub- station, wherever required. The scope shall include bending, shaping and connecting / clamping of the Aluminium tube to the equipment terminals/bus bar supports as required.</p>
<p><b>Supply and Erection of all types of aluminium bus bar terminal assembly, splice and connectors for 50mm bus bar.</b></p> <p>The scope shall cover supply, erection, testing &amp; commissioning of different type of terminal Assembly, connectors and splice (if applicable) as mentioned in relevant RDSO specification with fasteners and bimetallic strip (if applicable). The connectors shall be procured with latest RDSO specifications and approved source Only. The scope shall also cover contact resistance measurement as per procedure laid down in ACTM for commissioning of TSS, SP and SSP.</p>
<p><b>Supply and erection of 18 mm solid copper bus bar</b></p> <p>The scope shall cover supply and erection of solid copper busbar 18mm wherever required in OHE, including for Isolators. Prior approval from Dy.CEE/C shall be obtained before supply.</p>
<p><b>Supply and erection of solid copper bus-bar connectors. Bus Terminal (6310) &amp; Bus Splice (6320)</b></p> <p>The scope shall cover supply and erection of solid copper bus-bar junctions and connectors of various types specified, including bolts, nuts, etc, required at junctions or terminations of solid copper bus- bars. Prior approval from Dy.CEE/C shall be obtained before supply.</p>
<p><b>Supply of overhead equipment excluding catenary &amp; contact wire. Scope includes supply of number plates &amp; various types of caution &amp; other boards including shock treatment chart etc.</b></p> <p>The scope shall cover supply of all components i.e. different type of PG clamps and at the place of G jumper it should be ensured that Large PG clamp to be used as per latest RB guideline HQ TC -127, 5 mm Dropper wire, contact and catenary wire dropper clip, catenary and contact wire ending clamp, catenary and contact wire splices, double straps, Retro-reflective/ enamelled Number plate &amp; various type of caution &amp; other boards, shock treatment chart, anti-creep anchor including 9T insulator and fittings, Material required (False catenary) for providing contact wire in place of catenary wire under FOB, ROB and over line structure etc. (As per latest guide lines) with SPS for attachment on mast / structure, Jumper wires of suitable size with PG clamps for 'G, jumper (160sqmm), potential equalizing jumper, anti-theft jumper, X-feeder along with anti-falling</p>

arrangement as per latest HQ TC-127 (No. EL/TRD/ (10/2014) dtd. 06.10.20214), drop jumper, Isolator Jumpers and any other jumpers (where their use is approved), terminating wires etc.

S. No.	Description of Items
1.	Different types Parallel grooved clamps
2.	5 mm Copper Droppers and at bridge locations it should be ensured that 7 mm copper dropper to be used.
3.	Contact and catenary clips assembly.
4.	Contact and Catenary ending clamp assembly.
5.	Catenary & Contact Splice
6.	Retro-reflective/ Enamel Number Plates, sigma board with latest SPS and fastener, Caution boards, Danger Boards, Power block working limit boards, Unwired OHE/ Turn out, 250M, 500M, DJ close, DJ open and other indication boards must for commissioning for OHE as per HQ TC No. 59 and RB letter 2001/Elect(G) /170/1 Pt, dtd. 21.02.12
7.	Different type of Copper Jumpers i.e. 'G' (160 sq m m) provided in a manner that it should be in cross type arrangement, Potential equalizing, Anti-theft, X-feeder, Drop, Isolator Jumpers etc.
8.	Any extra fittings required for Turn-out, X-over, Diamond X-ing , also it should be ensured that no 'G' jumper to be used at X/O and T/O zone as per HQ TC-127.
9.	Anchor Double straps, Cut-in-insulators (9T) assembly for IOL's, compensating plate/equalizing plate
10.	If tramway OHE is required to be erected then it will be paid in OHE erection only for erection of contact wire including supply & erection of Bridle wire, PG clamp etc.
11.	Catenary Anti-creep complete assembly (catenary wire provision for anti-creep arrangement shall be invariably ensured)
12.	The scope covers the standard arrangement of false catenary under over line structure (FOB/ROB) location shall be done as per RDSO SMI TI/MI/0062 Rev-1 or latest
Note:- it should be insured that all the item fittings must be forged type instead of MCI type as per latest HQ TC-127 guidelines.	

**Supply of Catenary wire splice suitable for 65 sq. mm. catenary wire over and above as required of item no D1.**

The scope shall cover the supply of Catenary Splice suitable for 65 sq. mm catenary wire, over and above the requirement for item no. D1, as per Drawing No. ETI/OHE/P/1090 or latest.

**Supply of Contact wire splice suitable for 107 sq. mm. contact wire over and above as required of item no D1.**

The scope shall cover the supply of Contact wire splice (toothed type) suitable for 107 sq. mm contact wire, over and above the requirement for item no. D1, as per Drawing No. ETI/OHE/P/1081- 1Rev-C or latest.

**Supply and erection of 10 x 2.5, 2 x 2.5, 2 x 4 Sq.mm PVC insulated stranded copper cable for control and indication of interrupters.**

The scope shall cover supply, erection, testing & commissioning of different types of PVC insulated

*stranded copper cable for control and indication as per relevant RDSO specification. The scope shall cover erection, testing & commissioning of per meter length different type of control cable as specified in relevant specification.*

#### **SUB -SPECS**

1. *PVC Insulated Electric Cables conforming to IS:1554 (Part 1): 1988 latest.*
2. *Product should be ISI marked and BIS License number must declare.*
3. *Should be mentioned Nominal Area of Conductor (in Sq. mm) with the Number of cores (in Nos).*
4. *Material of conductor should be copper type with TYPE-A or PVC insulation type.*
5. *Type of armouring should be Galvanized steel formed wire (strip) armoured also the outer sheath of Type-ST 1 (Heat Resisting Insulation) or latest with fire improved quality as C2 - FR-LSH or better.*
6. *Shape of conductor should be solid and provision of filler and inner sheath should be as per Cl. 18.2 of IS:1554 (Part 1):1988 latest.*
7. *Cable should be identified as per Cl. 17 of IS:1554 (Part 1):2011 latest and packing of it should be identify as per Cl. 18 of IS:1554 (Part 1):2011 latest.*
8. *Availability of type test report from Govt Lab/ NABL/ ILAC to prove conformity of the specification as per IS:1554 Part 1 latest*
9. *Availability of Optional Test Reports must be Cold bend test, Cold impact test, Armour resistance test.*

#### **Supply and Erection of copper strip for earthing (25mm x 3mm)**

*The scope shall cover supply & erection of 25mmx3mm copper strip to connect the earth terminals of equipment like potential transformers, lightening arresters, LT supply transformer to the main masts of the gantries on which they are mounted. The scope shall cover all fastenings required for fixing the copper strips along any structure member of the gantry.*

#### **Erection of all types of GI bonds**

*The scope shall include the erection of galvanized structure & other bonds & galvanization shall be based on RDSO specification No. ETI/OHE/13 (4/8) with ACS 1 to 4 ensuring quality of zinc, base metal, surface preparation and galvanizing as per relevant standards as given in above RDSO specification. The weight of zinc coating to be adopted is 750g/Cm<sup>2</sup>. In case during installation, if galvanization is damaged due to hole drilling, welding, cutting, handling etc., the rectification shall be done as per clause 8 of RDSO specification no ETI/OHE/13(4/84) with ACS 1-4 (using zinc-based solder/zinc-based paints). For fabrication of various bonds (of different size), prevailing guidelines of ACTM, RDSO drawing will be followed in all respects albeit with galvanization instead of paints. The scope shall cover connecting a bond from traction feeder mast to the nearest non-track circuited rail, or earth electrode, including all fastenings at both ends. The scope shall include shaping of the bond & chamfering of rail holes prior to erection of bonds. The scope shall also include erection of PVC sleeve of approved design for structure under track circuit rail. The standard length of bond for billing purpose shall be consider to be up to 6 Mtrs, if in case a bond is required a length of more than 6 Mtrs then number of bonds to be considered accordingly.*

*Note: The Payment for supply of Schedule Item (B-7) shall be done only after the successful and satisfactory erection of material under Schedule Item E9*

*Note :- The work in this scope shall be completed as per latest RB letter no. HQ TC -127 (No EL/TRD/127(10/2014)dated: 06.10.2014).*

#### **Erection of 25 kV Vacuum Interrupter**

*The scope shall cover erection of 25kV Vacuum interrupter, complete with operating mechanism, all fittings, and accessories including terminal connectors. The scope shall cover grouting the supporting frame and mechanism box on foundation block and mounting of other accessories in their respective places. It shall also cover, testing and commissioning of the circuit breaker. The scope shall also cover the erection of an enamelled number plate and required quantity of long shackle brass Pad lock (Make - Godrej, Link). The Contractor shall make his own arrangement for*

power supply requirement for testing purpose. All necessary tools, equipment's instruments required for carrying out necessary checks and tests and commissioning shall be arranged by the Contractor.

**Erection of 25KV single pole isolator without earth contact assembly.**

The scopes shall cover erection testing and commissioning of isolator switches of approved make, complete with arcing horns, operating rods, out-trigger, operating rod guides, mounting base (Including 25KV pedestal insulators-2Nos and operating rod insulator-1 No) and integral locks. The scope shall also cover erection of a pad lock and a number plate of approved design for each isolator; and also cover erection of copper flexible jumper along with accessories between isolator to OHE and support of operating rods on gantries/mast. The scope shall not include supply and erection of small parts steel work complete with bolts and nuts etc. The scope shall also cover the Erection of 18mm copper bus bar for use with SPI in OHE. The Isolator and its assembly erection shall comply with the latest approved specifications and Instructions with latest amendments.

**Erection of PTFE Short Neutral section.**

The scope shall cover erection, testing and commissioning of a complete assembly of short neutral section (PTFE) (Phase brake). The scope shall also cover end fitting for contact & catenary wire and other material required for erection & smooth operation with earthing arrangement. 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.

Note :- The work in this scope shall be completed as per latest RB letter no. HQ TC -127 (No EL/TRD/127(10/2014)dated: 06.10.2014).

**Erection of materials for termination of Single/double conductor (including erection of cut-in insulator) of overhead equipment.**

The scope shall cover erection of all material necessary for the termination of double conductor of overhead equipment terminating wire on a traction mast or structure including clevis assembly, adjuster, anchor double strap, ending clamp for catenary or contact or terminating wire with fitting and 9-ton Composite or porcelain insulator (as desired by railway) assembly (for polluted zone) but excluding terminating wire if any, wherever double termination if required. Materials like equalizing /compensating double strap assembly. The scope shall also cover double composite insulators at termination locations in platform areas to enhance reliability and safety.

Note :- The work in this scope shall be completed as per latest RB letter no. HQ TC -127 (No EL/TRD/127(10/2014)dated: 06.10.2014).

**Erection of anti-creep with 9T insulator over & above as incl. in E34**

The scope shall cover the erection of complete Catenary Anti-creep assembly including 9T insulators, Terminations, copper anti creep wire etc. over and above as included in item no. E34. Erection shall comply with the latest approved specifications and Instructions with latest amendments.

**Erection of section insulator assembly including core and cut-in insulator.**

The scope shall cover erection testing and commissioning of all components required for a standard section insulator assembly on conventional OHE including section insulator assembly (Five parts), also provide 2 nos., stiffener (contact bar) & other materials as per details given below: All material shall be with latest specifications.

Railway ID No.	Description of component	Qty per unit
RI-1120	Catenary ending clamp	2 Nos.
RI-1190	Catenary dropper clip assembly	As required
RI-6170	Parallel clamp for double contact wire.	12 Nos.
RI-6110	Dropper assembly for Section Insulator.	As required
RI-6100-1	Porcelain section insulator along cree-page.	01 No.
RI-6020-1	9-ton insulator	01 No

RI-6181-2	Double straps for section insulator.	02 Nos.
<b>Erection 25KV solid core cut-in insulator.</b>		
The scope shall cover the erection testing and commissioning of complete 25 KV solid core Porcelain/ Composite cut-in-insulator including Double strap, Catenary wire or contact wire ending cone etc. as per latest RDSO/CORE specification. This item not covers the erection of cut-in-insulator which is covered in any other schedule.		
Note:- As per latest RB letter no. HQ TC-127 (No EL/TRD/127(10/2014) dated: 06.10.2014), This to be ensured that 100% testing (joint testing) of insulators before providing to the line. (as per the latest guidelines- use of only UTM)		
<b>Erection of 25KV solid core suspension insulator.</b>		
The scope shall cover the erection testing and commissioning of complete 25 KV solid core Porcelain / Composite suspension insulator assembly including Double strap, single eye clevis, suspension clamp etc. as per latest RDSO/CORE specification and drawings. This item not covers the erection of suspension insulator which is covered in any other schedule.		
Note:- As per latest RB letter no. HQ TC-127 (No EL/TRD/127(10/2014) dated: 06.10.2014), This to be ensured that 100% testing (joint testing) of insulators before providing to the line. (as per the latest guidelines- use of only UTM)		
<b>Erection of 25KV Post/Support insulator.</b>		
The scope shall cover the erection 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 & 2or latest.		
Note:- As per latest RB letter no. HQ TC-127 (No EL/TRD/127(10/2014) dated: 06.10.2014), This to be ensured that 100% testing (joint testing) of insulators before providing to the line. (as per the latest guidelines- use of only UTM)		
<b>Erection of Change over panel as per RDSO spec. suitable for AT supply.</b>		
The scope shall cover the erection, testing and commissioning of Change over panel as per RDSO specification No. TI/SPC/PSI/CLS/0020(12/02) (with A&C slip No. 1 to 4) or latest and suitable for 10 KVA, 25KVA or other required AT Supply specifications. The scope also covers Type-1 Box, any relay, fittings, Glands, fasteners, Lugs etc. for commissioning of panel and smooth working.		
<b>Erection of 10 KVA Change over panel as per RDSO spec. suitable for 10 KVA AT supply</b>		
The scope covers any relay, fittings, Glands, fasteners, Lugs etc. for commissioning of panel and smooth working.		
<b>Erection of terminal board in control cubicle.</b>		
The scope shall cover the erection, testing and commissioning of terminal board for 230V AC supply to Interrupters in switching post control cubicle as per RDSO/CORE latest drawings and specifications		
<b>Erection of 110V DC distribution board.</b>		
The scope also includes the grouting of the frame work of the distribution board in position or mounting it on the wall and necessary connections.		
<b>Erection of 230V AC distribution board.</b>		
The scope shall cover erection of a 230V AC distribution board in the Control Room. It shall include the grouting of the framework of the distribution board in position or mounting it on the wall and necessary connections.		
<b>Erection of PT Type-I</b>		
The scope shall cover erection and connecting of a 27.5 kV/100V potential transformer complete with all fittings and accessories including terminal connector. It shall also include mounting of the transformer in position and erection of the enamelled Number plate. Bus bar connectors provided with jumper connections.		
<b>Erection of 110V lead acid battery charger.</b>		
The scope shall also cover erection of a 110V, 200Ah low maintenance lead acid battery complete		

<i>with stand and accessories as mentioned in relevant specification and a tool board. The scope for erection shall include installation, connecting up, charging and commissioning of the battery.</i>
<b>Erection of 110V lead acid, 40 AH battery</b>
<i>The scope shall cover erection of a battery charger for 110V, 200AH low maintenance lead acid battery complete with stand and accessories as mentioned in relevant specification and a tool board. The scope for erection shall include installation, connecting up, charging and commissioning of the battery.</i>
<b>Erection of Lightning arrestor 42 KV</b>
<i>It shall also include mounting and connecting up of the Lightning Arrestor in position and erection of an enamelled number plate. The scope also covers THRC testing.</i>
<b>Erection of overhead equipment, including catenary, contact, jumper and dropper wires, fixing of number plates &amp; various type of boards</b>
<i>The scope shall cover erection of all components which is covered under Supply of OHE items (Schedule 'D' Item No.-1) including Catenary &amp; Contact wire, 5 mm Dropper wire, ending cones, contact/catenary splices, Retro-reflective/ enamelled Number plate, various types of caution and warning boards, retro-reflective Boards for Neutral section (As per latest guide lines) with SPS for attachment on mast/structure, Jumper wires of suitable size with suitable PG clamps for 'G, jumper(160sqmm), potential equalizing jumper, anti-theft jumper, X-feeder drop jumper, Isolator Jumpers and any other jumpers(where their use is approved), terminating wires etc. The scope also covers the providing catenary anti-creep wire and anchor, Provision of insulation paint and contact wire or false catenary wire in place of catenary under ROB, FOB and over line structures. Catenary and contact wire shall be supplied to contractor at concern SSE's store. Transportation cost shall be borne by contractor and shall not be paid under transportation item.</i>
<i>Note: -</i>
<i>1. The scope shall also include erection of any extra fitting required for turnout, cross over, diamond crossing.</i>
<i>2. The scope shall cover 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 etc.</i>
<i>3. The scope also covers Cut in (9T) insulator with catenary/contact wire ending clamp for catenary &amp; contact wire for all insulated overlaps.</i>
<i>4. The scope shall cover the erection of Catenary/Contact wire splices and other materials required for modification in existing OHE/New OHE where contractor claims erection of OHE cost.</i>
<i>5. If tramway OHE is required to be erected then it will be completed in OHE erection only for erection of contact wire including supply &amp; erection of Bridle wire, PG clamp etc.</i>
<i>6. The scope shall cover cost for erection of complete Anti-creep assembly including termination assembly, Catenary anti-creep wire and other SPS's etc.</i>
<i>7. The scope also covers the erection of a large span wire.</i>
<i>Note: Tower wagon may be supplied by Railway as per availability. Contractor shall make their own arrangement for erection of OHE structures &amp; wiring. Road crane shall be hired by contractor for erection of OHE structures for locations easily accessible by Road. However, Tower wagon shall be made available for final checking of OHE prior to commissioning.</i>
<b>Transportation &amp; laying of 10X2.5/2X2.5/2X4 Sq.mm PVC insulated stranded copper cable for control and indication</b>
<i>The scope also covers the transportation of cables from SSE/TRD/C's store including loading, unloading and handling. The scope also covers the supply &amp; erection of cu lugs, lacing and cable identification made of AL. labels at every 5 metres and at every corner on cable trench. The scope shall also cover insulation resistance measurement. Megger will be arranged by contractor. Method of erection available in Tender Document.</i>
<b>Transportation &amp; laying of 2x70 Sq.mm PVC insulated stranded aluminium cable from AT to DB</b>
<i>The scope shall cover erection, testing &amp; commissioning of per meter length of 2x70 sq. mm AT</i>



<p>cable as specified in relevant item. The scope also covers the transportation of cables from concern SSE's store including loading, unloading and handling. The scope also covers the supply &amp; erection of cu lugs, lacing and cable identification labels made of AL. at every 5 Mtrs and at every corner on cable trench. The scope shall also cover the insulation resistance measurement. Megger shall be arranged by contractor. Method of erection shall be as per Rly. guidelines. Scope shall also cover that of supply and erection of half round pipe for protection of Cable.</p>
<p><b>Erection of 150 sq.mm copper feeder wire.</b></p> <p>The scope shall cover manual erection of a 25KV feeder (along or across tracks) at the location of SP/SSP/FP/Gantries station. made of a single 37/2.25mm HDB stranded copper cross feeder (150sq.mm) The scope shall exclusive of feeder wire termination with antifalling arrangement with jumper wire to OHE and small parts steel work complete with bolts, nuts etc. if any. The scope also covers transportation of feeder wire from concern SSE's Store.</p> <p>Note:- As per latest RB letter No. HQ TC-127 (No EL/TRD/127(10/2014) dated: 06.10.2014) , it should be ensured that copper feeder wire of 150 sq. mm and to run on separate mast. Also crossing of the feeder wire through gantry arrangement.</p>
<p><b>Transfer of OHE from one support to another and adjustment of droppers</b></p> <p>The scope shall cover transfer of overhead equipment to a bracket assembly on a new mast or support and dismantling of the erected bracket assembly from the old mast or support and consequent adjustment to overhead equipment required such as re spacing of droppers.</p>
<p><b>Providing (Supply with erection) of anticlimbing device for SSP/SP.</b></p> <p>The scope shall cover supply &amp; erection of an anti-climbing device consisting of steel fixtures and galvanized barbed wire for mounting on the fencing panels as per approved drawings, the scope shall be per meter length of the panel. The scope shall include painting of the fixtures with two coats of red oxide zinc chromate primer and finished with two coats of Aluminium paint as per IS: 2339.</p>
<p><b>Dismantling &amp; removal of OHE complete with cantilever, droppers, contact &amp; catenary wire etc.</b></p> <p>The scope shall cover the dismantle of complete OHE including contact and catenary wire, droppers, jumpers, insulators &amp; other fitting if any. The scope also covers cutting of catenary wire, contact wire and other materials for DS-8 purpose (if required) and same will be handed over to concern SSE/C, Railways scrap depot for DS-8 or as desired by SSE/TRD/C. Transportation charges will be given relevant item of transportation. Site for DS-8 of dismantled items shall be decided by the SSE in charge.</p>
<p><b>Dismantling &amp; removal of Auxiliary transformer with DO fuse.</b></p> <p>The scope shall cover the dismantle of Auxiliary transformer including DO fuse assembly, Jumper wire, PG clamps, LT fuse box, anti-climbing device, Earth connection etc. Transportation charges will be given relevant item of transportation.</p>
<p><b>Dismantling &amp; removal of Isolator complete.</b></p> <p>The scope shall cover the dismantle of complete isolator including terminal connectors, jumper wire, PG clamps operating rod and support insulators, operating handle and SPS. Transportation charges will be given relevant item of transportation.</p>
<p><b>Dismantling &amp; removal of Mast, portal, TTC &amp; other small part steel</b></p> <ol style="list-style-type: none"> <li>1. The scope shall cover the dismantling of OHE mast, portal upright with boom, TTC and other small part steel by gas cutting and handing over to the railway at nominated place.</li> <li>2. The scope shall exclude the transportation charges and the same will be paid for against relevant item.</li> <li>3. The scope shall also cover cutting in suitable size pieces for scraping the material (i.e. 2.0M to 3.0M or as accepted by railway scrap depot).</li> </ol>
<p><b>Breaking of concrete foundation of Masts, portals &amp; TTC</b></p> <p>The scope shall cover the breaking of foundation of Mast, Portal TTC etc. up to 0.8 M below rail level. The scope also covers removal of debris outside track.</p>
<p><b>Dismantling &amp; removal of Guy rod assembly</b></p>

<i>The scope shall cover to dismantle the Guy rods with Anchor fitting, Guy rod fittings, double strap, stirrup &amp; Anchor V bolt etc. and same will be handed over to concern SSE/C Railways scrap depot for DS-8 or as desired by SSE/TRD/C. Transportation charges will be given relevant item of transportation.</i>
<b><i>Providing (Supply &amp; erection) of layout board for switching posts</i></b>
<i>The scope shall cover the providing (Supply with erection) of lay-out board for switching post. The board shall be framed with Aluminium section in suitable size. Before supply the board necessary approval should be got from Dy.CEE/RTM.</i>
<b><i>Providing (Supply &amp; erection) of Sectioning diagram board at stations</i></b>
<i>The scope shall cover providing (Supply with erection) of Sectioning diagram at Stations. The board shall be framed with Aluminium section in suitable size. Before supply the board necessary approval should be got from Dy.CEE/RTM.</i>
<b><i>Supply &amp; erection of firefighting equipment</i></b>
<i>The scope shall cover providing (supply with erection) of fire extinguisher confirming to IS: 2171 or latest. The firefighting equipment shall be suitable to take care of the B &amp; C class of fire. The extinguisher shall have 10 Kg. Capacity of dry chemical powder. The scope also covers hanging arrangement / suitable clamps.</i>
<b><i>Supply of First aid Box with Stretcher etc.</i></b>
<i>The scope shall cover supply with erection of standard first Aid box and stretcher with hanging arrangement of GI Sheet with pad lock as approved by the Employer. The list of items containing min the first aid box shall be obtained from employer/engineer.</i>
<b><i>Transportation of Railway supply materials from Railways depots to work site OR Transportation of Released material from work site to Railway depot.</i></b>
<i>Scope shall cover the Loading, unloading and transportation of all released OHE materials i.e. OHE mast, cantilevers, SI, SP Isolator, Guy rod, insulators, DA, Chair etc. from site to Construction depot. /Scrap depot for DS-8 or as desired by SSE/TRD/C. The scope also covers the transportation of materials (from OHE depot to Site) which is supplied by Railway and not covered in contractor's supply.</i>
<b><i>Digging of trench 450x1000m for AT cable.</i></b>
<i>The scope shall cover the manual digging of trench of suitable size as per RDSO specification, any changes and instructions may subject to site conditions and as per DYCEE/C/RTM.</i>
<b><i>Supply and fixing of HDPE pipe outer dia. 63mm for AT cable.</i></b>
<i>The scope shall cover the supply and fixing of Poly propylene rope strand hawser laid and strand pleated size 16mm dia. conforming to IS 14929-2001 along with hardware to secure the complete AT cable under the trench including the cable track crossing.</i>
<b><i>Drilling of horizontal bore below track by pushing method for laying of RCC/DWC/HDPE pipes of various sizes up to 450mm dia.</i></b>
<i>The scope covers the Drilling of horizontal bore below track by pushing method for laying of HDPE pipes of suitable size for cable crossing below the tracks, roads, etc, and as per the instructions issued by DYCEE/C/RTM. Prior approval for the location and work is mandatory from DYCEE/C/RTM.</i>
<b><i>Provision of Buried Rail.</i></b>
<i>The scope shall cover Providing (supply with erection) of Buried Rail with all required materials except piece of Rail (13mtrs) as per RDSO specification No. TI/SPC/PSI/EARTHING/0210, dated 20.08.2021. The scope shall cover Providing Earth electrode with Earth pit, GI Flat size of 75x8 as required for connecting earth electrode to Buried Rail &amp; Buried rail to Running track as mentioned in RDSO specification No. TI/SPC/PSI/EARTHING/0210, dated 20.08.2021. The scope shall cover Providing digging, copper rivet, fasteners, Nut bolt, washer, Check nut etc. Rail will be provided by Railway from nearby site/P-way depot. The transportation up to site shall be in contractor's scope. All material except rail shall be supplied by the contractor.</i>

<b>Tree trimming for OHE section.</b>
Clearance of OHE from any trees along the section should be maintained at least 4 Mtrs. Trees infringing the OHE should be trimmed. The scope covers tree trimming irrespective of tree height, and will be paid per tree (irrespective of number of branches to be cut). Decision for trees to be trimmed should be as per railway supervisor deputed at site.
<b>Core cutting at bridge pier block 40mm dia, hole 1000mm gap, and epoxy chemical grouting with minimum bond stress m20 concrete for 20mm bolt.</b>
The scope shall cover the Core cutting at bridge pier block 40mm dia, hole 1000mm gap, and epoxy chemical grouting with minimum bond stress m20 concrete for 20mm bolt. and as per the instructions issued by Engineering. Prior approval for the location and work is mandatory from Engineering.
Note:- As per latest RB guideline letter no. HQ TC-127 (No EL/TRD/127 (10/2014) dated: 06.10.2014) there's will be spare OHE mast foundation on bridges peir as per R.B. letter no. 2022/EEM/148/4/IRSOD dtd. 10.09.2025 so as the spare core cutting to be ensured.
<b>Grouting of Bridge mast bolt by suitable epoxy resin chemical compound.</b>
The scope shall cover Grouting of Bridge mast bolt by suitable epoxy resin chemical compound. as per the instructions issued by Engineering. Prior approval for the location and work is mandatory from Engineering. Construction and provision of template for grouting of bridge mast bolts shall also be in the scope of tenderer.
<b>Erection of Anti Monkey climbing device as Monkey Scare for mast.</b>
The scope shall include erection of Anti Monkey climbing device as Monkey scare measure of OHE mast at Monkey menace prone area as per RDSO SMI No. TI/MI/0056 Rev-2 or latest. The erection of AMCD shall be done as per site requirement of respective OHE structure and as directed by concern SSE/Elect/C.
<b>Erection of Antibird disc.</b>
The scope shall include the erection of Anti bird disc on ST, BT & 9-ton insulators and fitting as per Drg. No. TI/DRG/OHE/ABD/RDSO/00000/19/0 Rev 1 (Sh 1 & 2), under RDSO MI no. TI/MI/00059 Rev 2 (or latest).
<b>Erection of Anti Monkey climbing device as Monkey Scare for Portal</b>
The scope shall include erection of Anti Monkey climbing device as Monkey scare measure of OHE Portal/TTC upright at Monkey menace prone area as per RDSO SMI No. TI/MI/0056 Rev-2 or latest. The erection of AMCD shall be done as per site requirement of respective OHE structure and as directed by concern SSE/Elect/C.
<b>Erection of additional contact wire piece across RRA clamp with 02 Nos. of PG clamps on either side</b>
The Scope shall include supply and fitting of 02 Nos. of PG clamps on either side of RRA clamp as per RDSO SMI No. TI/MI/0058 Rev-1, dated 10.08.2021. The additional contact wire of length 2.00 meter shall be fixed on out of run contact wire across RRA clamp with the help of two Nos. PG clamps on either side (RI No. 1041-2) as per SMI. The work involves bending and fixing of contact wire as per site requirement.
<b>Erection of nylon/plastic net - High density polyethylene (HDPE) monofilament netting type III, UV stabilized as per IS 16008(part-2)-2016/PVC virgin HDPE Net preferably in black colour.</b>
The scope shall include Erection of Anti Bird high density poly ethylene (HDPE) filament netting type III, UV stabilized as per IS 16008 (Part-2)-2016. PVC virgin HDPE net preferably in black colour on fabricated structure, Portal/TTC, Fabricated DA, Gantry boom, etc. as per RDSO MI No. TI/MI/0050 Rev-1 Dtd.27.09.2021. the scope shall include tying with UV resistant nylon cable tie as per para 4.4 of RDSO SMI.
<b>65 sq.mm Cadmium copper catenary wire</b>
This scope shall include the supply of Uninsulated cadmium copper catenary wire (19/2.10mm) 65 sq. mm. As per RDSO specn.no. TI/SPC/OHE/CAT (Cu-Cd)/0971 or latest. Material is required in

<i>wooden Drum standard length of 3000/1500 meter per drum.</i>
<b><i>107 sq.mm copper contact wire</i></b>
<i>This scope includes the supply of HARD drawn grooved copper contact wire jointless, 107 sq. mm Made out of continuous Cast wire RDSO. AS PER RDSO Specification no. TI/SPC/OHE/CW/0971 or Latest. Material is required in wooden Drum standard length of 1500 meter per drum.</i>
<b><i>150 sq.mm copper feeder wire</i></b>
<i>This scope includes the supply of 150 sq. mm hard drawn stranded copper conductor for feeder wire of size 37/2.25 sq. mm overall Dia 15.75 mm as per RDSO specification no. TI/SPC/OHE/HDCSF/0031.</i>
<b><i>2x70 Sq.mm PVC insulated stranded aluminium cable</i></b>
<i>This scope includes the supply of PVC Insulated Armoured, Unscreened, Underground Railway Power Cable Aluminium Conductor as Per RDSO Spec. No Irs:S-63/2014 Rev 4.0 And Is:1554 Part-I. Size: -2core X 70 Sq. mm.</i>
<b><i>INSULATION PAINT-42KV HIGH INSULATION PAINT AS PER RDSO SPECIFICATION-TI0LKO/78/2020.</i></b>
<i>This scope includes the supply/provision of Insulation Paint-42kv High Insulation Paint as Per RDSO Specification-Ti0lko/78/2020 for ROB/FOB and other areas with less clearance from 25KV OHE. Make:- INSULECT SK-03/ CASEWELL or similar.</i>

*Note:- Any Other Modification As Per Railway Board /RDSO/ CORE/ WR HQ Latest Guidelines, Technical Circulars , Reliability Action Plan Items , MI/SMI Instructions And CTM -2022 Amendments Shall Be Deemed Included In The Scope Of Work Without Separate Mentions.*

**PART-II: For Electrical (General services) works:**

<b>v Drawings of the existing/Modified 33KV,11KV&amp;440V LT Overhead line of MPPKVCL &amp; Railway</b>
<i>Drawings for the existing 33KV &amp; 11KV power line of MPPKVCL &amp; Railway by underground cables, sketch on tracing paper by Auto CAD Drawing &amp; supply ammonia/Tracing paper print / in 6copies including signature of MPPKVCL &amp; Railway officials.</i>
<b>v Supply and erection of M.S. H-Beam 150x150 mm Pole of Long for stud complete with pit, foundation painting etc.</b>
<i>This item shall cover supply of M.S. H-Beam 150x150 mm Pole including necessary clamps of suitable size as per requirement. This item also covers excavation of plinth soft soil/ morrum, refilling and concreting for making pole foundation, muffing, curing and erection of H-Beam poles etc. as per schedule. Foundation shall be of 1:3:6 concrete mixture with muffing of 400mm Dia all around the pole and Erection of H-Beam poles, 1/6th portion of the H-Beam pole shall be buried in the foundation and alignment to be in vertical position or in suitable angle for stud, if required. The H- Beam pole shall be of H-Beam section size 150mm x 150mm (37.1 Kgs. / Mtrs. + 5%) of length It also includes cleaning, cutting and transportation of H-Beam poles, supply of paints and painting of complete pole with two coats of Red Oxide and two coats of aluminium paints of good quality with providing postman red paint band 200mm in length around the pole at a distance of 1 meter. below the lowest cross arm or live portion and black paint up to the height of 2 meter from the top of the muffing of H-Beam pole. The Scope also covers Stone block/pre cast block for base padding 450x450x75 mm.</i>
<b>v Supply &amp; erection of RS Joist 175x85 mm pole of 9 Mtrs long complete with pit foundation, painting etc.</b>
<i>This item covers excavation of pit in soft soil/ morrum, refilling and concreting for making pole/ foundation, muffing, curing and erection of M. S. RSJ poles etc. Foundation shall be of 1:3:6 concrete mixture with muffing of 400 mm dia. all around the pole. Erection of M.S. RSJ poles, 9 Mtrs. long, 1/6th portion of the M.S. RSJ pole shall be buried in the foundation and alignment to be in vertical position. The Scope also covers supply &amp; erection of MS RSJ pole of I section M.S. channel size 175mm x 85mm (19.6 Kgs. /Mtrs. + 5%), of length 9 Mtrs and J-hook and other clamping arrangement for LT Arial bunch cable. It also includes supply of paints and painting of RSJ poles with two coats of Red Oxide and two coats of aluminium paints of good quality with providing postman red paint band 200mm in length around the pole at a distance of 1 mts. below the lowest cross arm and black paint up to the height of 2 mts. from the top of the muffing.</i>
<b>v Supply &amp; erection of HT Cross Arm 'V' Type &amp; Top clamp.</b>
<i>This item covers supply and fixing of H.T. cross arm V type with top and back clamps (as per requirement) fabricated from 75x75x6mm or as desired by MPPKVCL/GEB, MS Angle including clamps of MS flat 65x8 mm with necessary hardware's etc. It also includes supply of paints and painting with two coats of red oxide and two coats of aluminium paint of good quality after erection on the pole.</i>
<b>v Supply and fixing of M.S. channel 100x50x5 mm on existing structures including clamps and hardware's etc.</b>
<i>This item includes supply of M.S. channel 100x50x mm size and fabricating, drilling of holes and fixing on existing D.P. or F.P. structures through M.S. clamps of suitable size and hard wares. The channel and clamps etc. shall be duly painted through red oxide and aluminium paints.</i>
<b>v Supply and erection of stay set with stay rod, stay clamp, straining screw, stay wire &amp; G.I. Pipe etc.</b>

<p><i>This item covers supply and erection of stay rod as per schedule with anchor plate or iron channel, stay clamps, stay tightener, stay wire size 7/3.15 mm, G.I pipe 25 mm approx. 1.5 meter. Respectively including excavation of pit refilling and concreting of stay rod with concrete mixture of 1:3:6 at an approx. depth of 1.5 meter.</i></p>
<p><b>v SETC of 200 Amps AB switch with D.O. assembly complete.</b></p>
<p><i>This item covers supply of 50 C/S 2 post type A.B. switch and D.O. fuse assembly complete with necessary clamps, hard ware's as per following specification: - Gang operated outdoor type air brake off load disconnecting switch 200 Amps. Triple pole, each pole consists of Galvanized Steel base, H.T. insulators as per B.S.S./I.S. non – ferrous knife and spring-loaded contacts, arcing horns of adequate section to break magnetizing current of the transformers horizontal G.I. pipe of adequate length for phase separation, adequate length of G.I. Pipes for operation from ground level and operating handle complete with locking arrangement in both OFF and ON positions. All ferrous parts hot dipped galvanized and non-ferrous parts heavily tinned to withstand weather. Manufactured generally in accordance with I.S.9920., suitable for horizontal /vertical mounting and for operation on H.T. supply, Make: Jaipuria, Elpro International or Shree Venkatesh. and the erection of A.B. switch shall be done in workman ship like manner on the D.P. structure in such a fashion that its operation is free from any trouble and should be smooth enough with proper fixing and alignment. As per instruction of Engineer - in-Charge. NOTE - Necessary cable for jump ring shall be provided for that no extra payment will be made.</i></p>
<p><b>v Supply and erection of 45KN Disc type insulators including hard wares etc.</b></p>
<p><i>This item covers supply and erection of 45KN Disc type porcelain/ polymer (as desired by MPPKVVCL/GEB) insulators as per MPPPLVVCL specifications including hardware etc. The Scope also covers complete strain hardware assembly. The insulator shall be vitreous throughout and shall have adequate mechanical strength, high degree of resistance of electrical puncture and resistance to climatic conditions. This also includes termination of existing ACSR conductor.</i></p>
<p><b>v Supply and erection of 10KN Pin type insulators including pin &amp; hard wares etc.</b></p>
<p><i>This item covers supply and erection of 10KN porcelain/ polymer (as desired by MPPKVVCL/GEB) pin insulator as per schedule including G.I. pin and hardware etc. The insulator shall be vitreous throughout and shall have adequate mechanical strength, high degree of resistance of electrical puncture and resistance to climatic condition.</i></p>
<p><b>v Supply and erection of ACSR dog conductor (0.10 inch<sup>2</sup>) 100 mm<sup>2</sup> Al equivalent, (6/4.72+7/1.57 cm) as per MPPKVVCL.</b></p>
<p><i>The Scope shall cover the supply and erection/ stringing of ACSR dog conductor (0.10 inch<sup>2</sup>) 100 mm<sup>2</sup> Al equivalent, (6/4.72+7/1.57 cm) as per MPPKVVCL Item Code M-0401002. The material shall strictly comply relevant standards of MPPKVVCL/GEB.</i></p>
<p><b>v Supply and erection of AAAC dog conductor (0.10 inch<sup>2</sup>) 100 mm<sup>2</sup> Al equivalent, as per MPPKVVCL.</b></p>
<p><i>The Scope shall cover the supply and erection/ stringing of AAAC dog conductor (0.10 inch<sup>2</sup>) 100 mm<sup>2</sup> Al equivalent, as per MPPKVVCL/GEB Item Code M-0401011. The material shall strictly comply relevant standards of MPPKVVCL/GEB.</i></p>
<p><b>v Providing of jointing sleeves (Alu.) for DOG Conductor.</b></p>
<p><i>The Scope shall cover the supply and erection jointing sleeves (Alu.) for DOG Conductor. The item shall comply MPPKVVCL/GEB specification for Item No. M-404231</i></p>
<p><b>v SETC of Cable jointing/ termination kit suitable for 3C up to 400 mm<sup>2</sup> XLPE cable.</b></p>

*This item covers Supply, Erection, Testing & Commissioning of XLPE (earthed) 3 core of various sizes up to 400 mm<sup>2</sup>, armoured cable as per schedule.*

*necessary arrangements shall be made by contractor for loading and transportation of cables to site. Before laying the cable the trench/pipe should be thoroughly checked for sharp ballast & etc. so that cable may not be damaged. Two or four lengths of cable shall be laid for each crossing and as per site requirement, One or Two nos. of cable will be connected to O/H and other shall be kept as spare. All the cables shall be suitably and separately clamped with the structure through suitable M.S. flat clamps of 40x5 mm size MS flat & nut bolts etc.*

*Before and after laying the cable, the I.R. value should be checked and all the instruments for testing shall be arranged by the contractor.*

*While laying the cable, care should be taken that no tree roots come on way of the cable, as it may damage the insulation. Armouring of cable should be earthed at both the ends.*

*Cable crossing on the Road/Rly. track should be at right angle.*

*After laying the cable a layer of 75 mm of soft soil should be placed above the cable and then if required, for mechanical protection second-class burnt brick should be placed on it to cover all the cable laid. After doing this, the trench can be filled up with soil available thereby. The pipe shall be laid in a slope for easy drain out of the water and joints should be waterproof.*

*Wherever the cable emerges out of ground at least one loop of sufficient radius should be provided under the ground. While laying the cable it should be ensured that no obstruction should come in way like drainage, power cables, telecommunication cables etc. The water logging should be avoided.*

**v Supply, erection, testing and commissioning of earthing arrangement using 40 mm G.I. Pipe electrode with 8 SWG G.I. wire from earth electrode to nearest structure or dist. Board**

*This item covers supply of earth electrode fabricated from G.I. pipe of 40 mm Dia, 3.0 meter long having conical shape at one end and 12 mm Dia holes at a distance of 150 mm around the pipe up to 2.5 Mtrs from conical shape, it shall also have one suitable MS flat (50x5 mm) clamp with 12 mm Dia GI nut & bolts having 1 no. spring and 2 nos. plane washers at the top of Earth electrode for connecting GI wire.*

*This item also covers excavation of pit and grouting of earth electrode with sufficient quantity of charcoal and salt. It also includes supply and provision of pre cast R.C.C. earth pit of size 500mmx500mm, 300mm height and 100mm thick wall including RCC cover of 500x500x100mm. RCC pit and cover shall be reinforced with 12 mm Dia M S rods.*

*G.I. wire 8 SWG shall also be supplied and laid from earth electrode to nearest structure and connections shall be made through G.I. BOLTS AND WASHERS.*

*The earth electrode shall be tested in presence of railway engineer and value shall be recorded on earth pit. The contractor shall arrange testing instruments. Value of earth resistance shall not be more than 10 ohms, if so, necessary treatment shall be given.*

*Note: Earth station shall comply MPPKVCL circular no. 1516 dated: 17.03.18.*

**v Supply and erection of 6 SW GI wire with necessary hardware's.**

*The Scope shall cover the supply and erection of 6SWG GI wire including necessary hardware's and clamps required for fixing/ connecting the wire.*

**v Supply and provision of cable route Marker for 11KV & 33 KV line**

*This item includes supply of cast iron cable route marker for 11KV & 33KV with M.S. rod stand as described in MPPKVCL item code no. M0404385 and installation in the cable trench with cable route mark in 1:3:6 ratio of cement, sand & gravel complete in all respect with proper curing at the locations as decided by engineer at site.*

**v Supply and fixing of Danger board 33 KV or 11 KV.**

<p><i>This item covers supply and fixing of MS sheet 2 mm thick enamelled Danger board size 150x225 mm for 11KV/ 33KV including clamps and hardware's required for fixing the danger board on structure/pole.</i></p>
<p><b>v Supply and fixing of Anti climbing device assembly.</b></p>
<p><i>This item covers supply and fixing of Anti climbing device fabricated from MS Flat and MS Rod with clamps and hardware's required for fixing the anti-climbing device on structure/pole including painting with aluminium paint. the Scope also covers supply and fixing of barbed wire GS 2.24 mm dia. (14SWG).</i></p>
<p><b>v Supply, erection, testing and commissioning of Lightning Arrestor complete set of 3 Nos.</b></p>
<p><i>This item covers supply erection testing and commissioning of Lightning arrestor Gapless/ metal oxide substation type complete set of 3 nos. as per schedule with necessary clamps &amp; hardware's Make: MPPKVVCL/GEB accepted makes.</i></p> <p><i>NOTE: - The material shall be complied MPPKVVCL/GEB latest specification. Necessary cable for jumpering shall be provided for that no extra payment will be made.</i></p>
<p><b>v Laying, testing &amp; commissioning of XLPE cables of various size up to 400 mm<sup>2</sup> in existing trench, RCC pipe, GI pipe or air.</b></p>
<p><i>This item covers laying of cables of various sizes up to 400 mm<sup>2</sup> armoured cable as per schedule. Necessary arrangements shall be made by contractor for loading and transportation of cables to site.</i></p> <p><i>(i) Before laying the cable the trench/pipe should be thoroughly checked for sharp ballast &amp; etc. so that cable may not be damaged. Two or four lengths of cable shall be laid for each crossing and as per site requirement, One or Two nos. of cable will be connected to O/H and other shall be kept as spare. All the cables shall be suitably and separately clamped with the structure through suitable M.S. flat clamps of 40x5 mm size MS flat &amp; nut bolts etc.</i></p> <p><i>Before and after laying the cable, the I.R. value should be checked and all the instruments for testing shall be arranged by the contractor.</i></p> <p><i>While laying the cable, care should be taken that no tree roots come on way of the cable, as it may damage the insulation.</i></p> <p><i>Armouring of cable should be earthed at both the ends.</i></p> <p><i>Cable crossing on the Road/Rly. track should be at right angle.</i></p> <p><i>After laying the cable a layer of 75 mm of soft soil should be placed above the cable and then if required, for mechanical protection second-class burnt brick should be placed on it to cover all the cable laid. After doing this, the trench can be filled up with soil available thereby.</i></p> <p><i>The pipe shall be laid in a slope for easy drain out of the water and joints should be water proof.</i></p> <p><i>Wherever the cable emerges out of ground at least one loop of sufficient radius should be provided under the ground.</i></p> <p><i>While laying the cable it should be ensured that no obstruction should come in way like drainage, power cables, telecommunication cables etc. The water logging should be avoided.</i></p>
<p><b>v Supply Of 11 KV Grade (HT) 3 Core, 300 Sq. Mm Aluminium Conductor XLPE Insulated Extruded PVC Inner Sheathed Galvanized Steel Round Wire Armoured Extruded HR PVC Outer sheathed Cable Confirming to Iss:7098(Part-II) Or Latest Version.</b></p>
<p><i>The Scope includes supply of cable as per SPECIFICATION NO.- MRTS/EL/FIRE RESISTANT/CU/LS ZH/ JUNE 2024 along with Transportation &amp; storage. Storage of the cable safely till the laying of the cable is the responsibility of the contractor. The size/rating shall be as mentioned in NIT and/or requirement as per detail design. Cable length in Drum to be selected to minimize the cable joint. Cable shall be supplied just in time before the required work. All the items not specifically mentioned here but necessary to make the system complete and suitable for desired application as per Technical Specifications and Drawings will be deemed to be included in the quoted scope.</i></p>



<b>v Drilling of horizontal bore below track by pushing method for laying of GI/CI/ spun concrete pipes of various sizes up to 450 mm dia.</b>
<i>This item covers drilling of horizontal bore by pushing method or any suitable means in all types of soil 1.5 meter below ground level or 2.1 meter below track level for laying of GI/HDPE/DWC pipes 150 mm to 450 mm Dia by pushing method in presence of Railway representative taking necessary safety precautions of track and movement of trains.</i>
<b>v Supply and laying of HDPE pipe below the track</b>
<i>This item include supply and laying of HDPE pipe below the track including hard rocks with complete accessories and hard wares.</i>
<b>v Supply and laying of "B" class GI pipe with necessary bends and clamps.</b>
<i>This item covers Supply &amp; Laying of G. I. pipe heavy duty 'B' class, as per schedule Pipe shall be provided on the cable while terminating to the overhead on the M. S. channel pole. One end of which shall be grouted in the muffing/ground and other end of which shall be provided with PVC bushing and M.S. flat clamp of 40x5mm flat including hard wares, G.I. bend shall also be supplied and provided wherever required. G.I. Pipe shall also be provided, if required in the existing notch also made in rocky area.</i>
<b>v Supply laying of RCC Pipe 150 mm Dia</b>
<i>This item covers supply and laying of 150 mm internal Dia, reinforced concrete heavy duty non pressure RCC pipes with collars class NP-4, as per IS 458/1988 in the existing trench. The pipe shall be laid with a gradient to facilitate drainage of water and it shall be at right angle to the track. The contractor shall have to submit manufacturer test certificate.</i>
<b>v Supply and erection of LT cross arm 4 pin with 3 shackle insulator and earth knob.</b>
<i>This item covers supply and erection of 4 pin / 5 pin LT cross arm fabricated from M.S. angle 50x50x5 mm including 3 / 4 nos. LT shackle insulators (90x75mm) with 1 no. Aluminium Earth knob. It also includes necessary clamps &amp; hard wares etc. required for fixing on poles and painting with two coats of red oxide and two coats of aluminium paint of good quality after erection on the pole.</i>
<b>v SETC of LT XLPE Arial bunch XLPE cable 3x70 + 1x16 + 1x50 sq. mm with aluminium alloy Bare messenger wire as per MPPKVVCL item.</b>
<i>Supply, erection, testing and commissioning of LT XLPE Aerial Bunch XLPE Cable 3X70 + 1X16 + 1X50 Sq. mm with aluminium's alloy Bare messenger wire as per MPPKVVCL Item No. M-0402119. Material shall be strictly complied MPPKVVCL specification.</i>
<b>v Supply and stringing of cradle guarding on existing cross arm/channel.</b>
<i>This includes supply and design of garnetting cage by 8 SWG GI wire as Guard wire and 10SWG GI Wires as cradles. The cradles are properly binded on guard wires by binding wires at a distance of minimum 02 Mtrs apart. The 8SWG guard wires shall be stringed on each end of cross arm of overhead line poles which is properly binded with binding wires and properly earthed at terminals and on each earth points on pole. The complete garneting so designed to withstand high wind pressure. No joints will be allowed in mid span in guard wires of garnetting.</i>
<b>v Excavation of trench 500 mm wide and 1000 mm deep in all type of soil.</b>
<i>This item covers excavation of trench in all types of soil hard/soft 500mm vide 1000/1500 mm deep from ground level as per the instruction given by engineer at site and back filing the same after laying of the RCC pipe/cable and ramming the soil. This also covers making of notch of 200mm depth in rocky are for laying of G.I. pipe and back covers the same with sand &amp; cement after laying of G.I. pipe. the area shall also be repaired to its original position. If the digging of 1000mm/1500mm is not possible then it is varied as accepted by the railway representative at site. The payment shall be made in proportion of the depth of excavation compared to 1000 mm/1500mm depth.</i>

<p><b>v Shifting of 11/.4 KV transformer up to 100 KVA to new DP structure erected against item no 3 with supply and erection of necessary mounting arrangements except channel.</b></p>
<p>This item shifting of 11/0.4 KV transformer up to 100 KVA to new DP Shifting of 11/0.4 KV transformer up to 100 KVA to new DP structure erected against item no.3 including supply &amp; erection of necessary mounting arrangements except MS channel.</p>
<p><b>v Dismantling &amp; removal of existing Rail or PCC or RSJ poles complete in all respect including all fixtures released materials shall be handed over to the concerned area stores of MPPKVVCL with joint signature &amp; receipt.</b></p>
<p>This item covers dismantling of existing Rail or PCC/ RSJ/H Beam in full length and without any damage, if possible. The pole shall be removed by excavation of pit around the pole and breaking of R.C.C. foundation if any. The released poles shall be handed over at concerned Area Stores of MPPKVVCL/GEB or as per instruction given by engineer at site, transportation charges shall be borne by contractor. The contractor, without any extra cost, if required for removal, shall arrange necessary tools, ropes, gas cutter etc.</p>
<p><b>v Dismantling and removal of existing HT overhead lines span complete in all respect including all fixtures i.e. GI wire, channels, brackets, guarding channels etc. (Released material shall be handed over to concerned area stores of MPPKVVCL with joint signature and receipt.)</b></p>
<p>The scope shall cover cost for dismantling and removal of existing HT overhead lines span complete in all respect including all fixtures i.e. GI wire, channels, brackets, guarding. 3. channels and other released items etc. (Released material shall be handed over to concerned area stores of MPPKVVCL/GEB with joint signature and receipt.)</p>
<p><b>v Supply and Erection of BIS certified Energy Efficient Level-III (old)/Level-II (new) Conventional 11/.433 KV Distribution transformer.</b></p>
<p>Supply portion under this item shall include supply of standard, tested equipments only as per railway technical data and relevant IS. Erection under this item includes provision and connection from incoming and outgoing sides of these equipments on suitable MS base plate which is to be clamped on DP structure, using suitable jumpers, clamps, nuts, bolts [of size appropriate for the purpose whose supply is included in erection. The transformer shall be of 11 KV/0.433 KV, 3 phase, 50 HZ, ONAN type as mentioned in the technical data, it should have bushing on the HT side &amp; cable termination box on the LT side. It also includes the supply &amp; erection of 11 KV expulsion, drop out fuse unit complete with operating rod &amp; other accessories as per relevant IS &amp; technical data. The work also includes supply and erection of 11 KV gang operated AB switch, triple pole completes with operating rod, locking arrangement &amp; other accessories as per relevant IS &amp; technical data. Also, the 11 KV lightning arrestor complete with all accessories as per relevant IS &amp; technical data should be supplied &amp; erected under this item. All these above-mentioned items are to be erected on the double pole structure. After proper fixing of these equipment's connection shall be made from the nearest supply point to the LA, AB switch, DO fuse and to the HT bushing of the transformer with appropriate size of aluminium conductor cable, PG clamps etc., The LT side of the transformer shall be connected with PVC insulated cable with proper termination. After all necessary connection of transformers and other equipments on both incoming &amp; outgoing side all required /prescribed testing and commissioning shall be done as per Rly technical data &amp; manufacturer's recommended tests. Note: - It should be ensured that the 'BEE' certification must be required before planning to execution of distribution transformer as per HQ letter no. EL/111/3 general dt. 20.02.2026.</p>
<p><b>v Supply &amp; erection of LT distribution board for 25 KVA transformer suitable for outdoor application. It also includes supply of suitable MS channel, nut, bolts, clamps etc. for its fixing/erection on the DP structure and electrical connection.</b></p>

<p>The LT panel/ MDB/SDB incorporating all specified switchgears, meters &amp; all other accessories shall be supplied as per Railway technical data and it should be complete in all respect. This shall be erected at given location by making required arrangements of foundation / grouting of bolts of appropriate size and or by providing clamps of MS flat of appropriate size according to weight and site conditions. Then this shall be connected using already provided cables and their termination kits on incoming and outgoing sides. Then testing shall be done. The drawings showing the details of panel SDB shall be approved by RLY. Engineer before making foundations and erection. The LT switchgear, contactors&amp; motor starter should confirm to IS:13947/93 or latest, MCB as per IS:8828/78,96 or latest, MCCB as per IS:13947/93 or latest and shall be of standard reputed firms only.</p>
<p><b>v Supply &amp; erection of LT distribution board for transformer suitable for outdoor application with isolator switch of 200Amps TPN with HRC fuses on incoming side and 6nos.SP MCCB of 60Amp on outgoing side. It also includes supply of suitable MS channel, nut, bolts, clamps etc. for its fixing/erection on the DP structure and electrical connection.</b></p>
<p>The LT panel/ MDB/SDB incorporating all specified switchgears, meters &amp; all other accessories shall be supplied as per Railway technical data and it should be complete in all respect. This shall be erected at given location by making required arrangements of foundation / grouting of bolts of appropriate size and or by providing clamps of MS flat of appropriate size according to weight and site conditions. Then this shall be connected using already provided cables and their termination kits on incoming and outgoing sides. Then testing shall be done. The drawings showing the details of panel SDB shall be approved by RLY. Engineer before making foundations and erection. The LT switchgear, contactors&amp; motor starter should confirm to IS:13947/93 or latest, MCB as per IS:8828/78,96 or latest, MCCB as per IS:13947/93 or latest and shall be of standard reputed firms only.</p>
<p><b>v Supply and stringing of ACSR conductor 6/1/2.50mm &amp; 1/2.59mm steel wire on existing cross arm including split insulator.</b></p>
<p>This item covers supply and stringing of ACSR conductor 6/1/2.59mm &amp; 1/2.59MM steel on OH line. confirming to IS 398 Pt. II 1976 with binding on insulators jointing jumpering tee off connections etc. and cleaning of obstacles (tree trimming etc.) in the alignment of O. H. line. The payment will be made in running meters.</p>
<p><b>v Co-ordination/ liasoning and chasing with State Utility Company for availing new electrical connection/ augmentation of sanctioned load at stations, level crossings etc. including applying for load, collection of estimates for loads, modification of power line crossings, arranging payment from EL/Construction, depositing payment to State Utility Company, arranging release of load &amp; other related works, payment to be made to SEB for new connection, load augmentation, modification of power line crossings etc.</b></p>
<p>Co-ordination/ liasoning and chasing with State Utility Company/ Crossing owner for availing new electrical connection/ augmentation of sanctioned load at stations, level crossings etc. including applying for load, collection of estimates for loads, modification of power line crossings, arranging payment from EL/Construction, depositing payment to State Utility Company and submitting receipt, arranging release of load &amp; other related works, payment to be made to SEB for new connection, load augmentation, modification of power line crossings etc. Payment will be made for each crossing.</p>
<p><b>v Supply of 1.1 KV 4 Core, 400 sq. mm LT XLPE cables.</b></p>
<p>This includes the supply of 4 Core 300 Sq. cable mm Lt PVC Armoured Cable of Size 4 Core X 300 Sq. mm. PVC Outer Sheathed Fr of Type St 2 Cable Fr Grade C1 Category Having Heat resisting Insulation of PVC Compound Type C With Aluminium Conductor Suitable for Rated Voltage At 1100 Volts Grade and Conforming to Is 1554 Part 1 1988 Reaffirmed 2005.</p>

**v Supply of HT PVC sheathed three core power cable with stranded aluminium conductor, armoured suitable for rated voltage of 33KV grade and confirmation to IS :7098 (Pt. II) 1985 or latest size 3 CoreX300 Sq. mm.**

This scope includes the supply of ISI Marked 3 core X 300 sq. mm, 33 KV (E) Grade HT XLPE strip armoured aluminium conductor, copper tape screened PVC sheathed cable with extended steel conducting compound XLPE insulated, Insulation screening with extended steel conducting compound in combination steel flat strip armoured and overall PVC sheathed cable confirming to IS:7098 Pt-II/2011 or latest. Cable marked length and date of manufacturer to every 5 meters. Make: Havells, Polycab, RR Kabel, APAR or similar.

**v Supply and erection of Back Clamp for H Beam pole 65x8 mm MS flat.**

The Scope shall cover the supply and erection of back clamps for H-beam poles, made from 65x8 mm MS flat. This includes the excavation of pits in soft soil or morrum, refilling, and concreting for the foundation of the pole, muffing, curing, and the actual erection of the H-beam poles. The foundation work shall consist of a 1:3:6 concrete mixture with muffing of 400 mm diameter around the pole. H-beam poles, each 11 meters long, will be installed with 1/6th of their length buried in the foundation. The alignment must be vertical or at a suitable angle, if required. The H-beam poles shall have a section size of 150 mm x 150 mm (37.1 kg/m  $\pm$  5%) and will be cleaned, cut, and transported as part of the scope. The work also includes the supply of paints and the painting of each pole with two coats of red oxide and two coats of aluminium paint. Additionally, a postman red paint band, 200 mm in length, will be applied around the pole at a distance of 1 meter below the lowest cross arm or live portion, and black paint will cover up to 2 meters from the top of the muffing.

**v Back filling of poles with boulders.**

The Scope shall cover the backfilling of poles with boulders. This includes the careful placement and compaction of boulders around the base of the poles to provide stable support and prevent shifting. The work will ensure that all gaps are filled and the boulders are adequately compacted to secure the poles in their designated positions.

**v Supply, erection testing and commissioning of Earthing Set (DTR Earthing) as per circular No. 1516 dated 17.03.08 (earthing Set 40 mm 3 meter GI pipe, GI wire earthing clamp and nut bolt.**

The Scope shall cover the supply, erection, testing, and commissioning of an earthing set (DTR earthing) as per Circular No. 1516 dated 17.03.08. This includes a 40 mm diameter, 3-meter GI pipe, GI wire, earthing clamp, and nut and bolt. The work involves ensuring that the earthing set is properly installed and tested to meet the specified standards and requirements.

**v Supply, fabrication, laying 0.5 Mtrs below the ground and termination of main earth grid of size 45 mm x 8 mm MS flat hot dipped galvanized from EP to EP, transformer & other equipment's.**

The Scope shall cover the supply, fabrication, and installation of a main earth grid consisting of 45 mm x 8 mm MS flat, hot-dip galvanized. The work includes laying the grid 0.5 meters below ground level and terminating the grid at the Earth Pit (EP), transformer, and other equipment. All necessary connections and terminations are to be included, ensuring a complete and effective earthing system.

**BALLAST: - 1/2" size black ballast (black stone) shall be supplied and spread to the substation premises to a height of 150mm, as per the directives of Railway Authority.**

The Scope shall cover the supply and spreading of 1/2" size black ballast (black stone) within the substation premises. The ballast shall be spread to a height of 150 mm, following the directives of the Railway Authority.

***Pucca Cable trench: Construction of cable trench and laying of UG cable in 700 mm deep cable trench made of brick masonry. This includes supply of all materials erection, commissioning of cable & trench etc. The laying of cable from transformer to the panel board shall be done in cable trench made of brick masonry complete with excavation of soil, construction of bricks wall for a height of 700 mm and inside width of 500 mm. Both wall and bottom surface of inside trench shall be finished with a fine coating of plaster. This constructed cable trench shall be covered with concrete slabs each of requisite width and a length of 1m. All the top slabs shall be provided with two nos of hooks as to enable to lift the same without any difficult and in normal course the hook should be pressed towards inside of trench. This cable is to be drawn from transformer to the panel board through cable trench. Both the raising ends of the cable (i.e. from ground to the apparatus) shall be drawn through suitable GI pipe with clamps nut bolts etc. Necessary cable glands shall be provided at both ends.***

*The Scope shall cover the construction of a pucca cable trench and the laying of underground (UG) cables. The trench shall be 700 mm deep and constructed of brick masonry, with an inside width of 500 mm. This includes the supply of all materials, erection, and commissioning of both the cable and the trench. The work involves excavation of soil, building brick walls to a height of 700 mm, and finishing both the wall and bottom surfaces of the trench with a fine plaster coating. The trench shall be covered with concrete slabs, each of 1 meter length and of the requisite width, equipped with two hooks per slab for easy lifting and placement. The cable shall be drawn from the transformer to the panel board through this trench. Both ends of the cable, where it raises from the ground to the apparatus, shall be drawn through suitable GI pipes, with clamps, nuts, bolts, and necessary cable glands provided at both ends.*

***Supply & erection of G.I. stripe size: 30 x 5 mm***

*The Scope shall also cover for Supply & erection of G.I. flat of 30 x 5 mm duly painted with nut, bolts and washers of 12 mm diameter (approx.) shall be provided as per site requirement.*

***Supply, fixing testing and commissioning of AC Socket point with 20 Amp MCB in Socket Enclosers with Plug Socket.***

*The scope shall cover the supply, fixing, testing, and commissioning of an AC socket point with a 20 Amp MCB, housed in an enclosure with a plug socket. To ensure a maintenance point inside the tunnel, plug & sockets shall be required inside trolley niches. For storing these set of plug & sockets, a cabinet shall be required. The cabinet shall be installed inside the trolley niches and shall have a degree of IP 66 and IK 10 protection. Rating of plug & sockets shall be as per single line diagram. The dimensions of the enclosure shall be as per drawings. The lower edge of the maintenance cabinet shall be at 1.20 m above the finished floor level.*

*The enclosure for the maintenance socket should be robust design that is weatherproof, resists vibration and degree of protection up to IP66 suitable for an "aggressive environment" (e.g. tunnels). The enclosure made of stainless-steel sheet (V4A) Consisting of: cover, circumferential case and bottom Connection housing in robust, corrosion-resistant from materials of Requirements class I, VA4 (1.4571) stainless steel.*

*The enclosure shall comply and tested for intrinsic fire resistance E90 in accordance with DIN 4102 part 12; fire resistance, F 90 in accordance with DIN 4102-2; fire load insulation, I 90 in accordance with DIN 4102-11.*

*The lid locking system using screws. The enclosure is Vibration resistance suitable for road & railway tunnels with higher levels of oscillation and fluctuations in pressure. The enclosure classification partly in according with EN 1634-3, EN 1366-11, EN 13501-1+A1, EN 13501-2+A1.*

*The cabinet shall be suitable for installation in tunnel environment. It shall be fixed type, single*

*front, wall mounting type, ready for installation at site. It shall be designed to facilitate easy inspection, maintenance and repair.*

*The cabinet shall be of adequate size to facilitate enough space for maintenance and cooling. The size of the cabinet shall be designed in such a way that the internal space will be sufficient for hot air movement, and the electrical component does not attain temperature more than 40 degree Celsius in normal conditions. The cabinet shall be designed to withstand the heaviest and harsh condition of the tunnel.*

*The cabinet shall be totally enclosed, sturdy and robust, rigid construction, wall mounted, dust, moisture, termite and vermin proof, air - insulated, suitable for operation on three phase/ single phase, 433V/ 240V, 50 Hz. The lid shall have polyurethane gasket and shall be screw lockable.*

*The socket unit should be inside the E90, IP 66 Stainless steel cabinet and socket should comply with IEC 60309 and the Power Socket shall be made of high-quality thermoplastic polycarbonate (rust free, shock proof, corrosion free, fire retardant) with IP44 protection, contact terminals made of high-quality copper alloy (brass) & all steel components (screws, springs, etc.) shall be zinc plated or nickel plated. Power sockets shall also be provided for emergency and maintenance. The socket outlets shall be compatible to the rescue and maintenance equipment.*

*The Maintenance Plug & Sockets DB should hold type test certificates as per IEC 60309, EN60529 & DIN 4102-12 for enclosure. The assembly should consist of proper Insulation bolt, Stainless steel screws / bolts and fasteners, MCB, Hinged Flap (optional), along with wiring accessories, Earth strips, Sleeves, etc. of standard specifications.*

*Reference International standards:*

*DIN 4102-12: Fire behaviour of building materials and structural elements. Part 12 Intrinsic fire resistance of electric cable system, requirements and tests.*

*DIN 4102-2: Fire Behaviour of Building Materials and Building Components; Building Components; Definitions, Requirements and Tests.*

*DIN 4102-11: Fire behaviour of building materials and building components; pipe encasements, pipe bushings, service shafts and ducts, and barriers across.*

*BS EN 1634-3: Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 3: Smoke control test for door and shutter assemblies.*

*BS EN 1366-11: Fire resistance tests for service installations Fire protective systems for cable systems and associated components.*

*EN 13501-1+A1: Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests.*

*EN 13501-2+A1: Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services.*

*IEC 60529: Degree of Protection for Enclosures (IP code).*

*IEC 60309: Specifies general functionality and safety requirements for industrial power connectors.*

**Supply installation testing and commissioning of Tunnel LED Luminaires of 20 Watt including internal wiring, support structure etc.**

*The scope shall cover the supply, installation, testing, and commissioning of tunnel LED luminaires of 20 watts, including internal wiring, support structure, and other related components. Prior approval from Dy.CEE/C shall be obtained before supply.*

**CABLE SUPPLY & LAYING WORK of AL 4x16,25,50,70 sq. mm and copper cable 3x1.5,2.5 sq. mm**

*This item covers supply and laying of 1.1 KV LT cables of various sizes up to 400 mm<sup>2</sup> armoured cable as per schedule. Necessary arrangements shall be made by contractor for loading and transportation of cables to site.*

*All the cables shall be suitably and separately clamped with the structure through suitable M.S. flat clamps of 40x5 mm size MS flat & nut bolts etc.*

*Before and after laying the cable, the I.R. value should be checked and all the instruments for testing shall be arranged by the contractor.*

*While laying the cable, care should be taken that no tree roots come on way of the cable, as it may damage the insulation.*

*Armouring of cable should be earthed at both the ends.*

*As copper cables for 3 core 1.5 sq. mm and 2.5 sq. mm should be of multi strand PVC insulated flexible copper cable. individually PVC insulated & overall PVC sheathed 1.1 KV Grade conforming to IS :694 and 8130 or latest.*

*Cable specification should match these requirements and should be approved by the concern SSE or officers of the division.*

### **SUB -SPECS**

**1.** PVC Insulated (Heavy Duty) Electric Cables conforming to IS:1554 (Part 1): 1988 latest.

**2.** Working voltage Up to and including 1100 Volts.

**3.** Product should be ISI marked and BIS License number must declare.

**4.** Nominal Area of Conductor (in Sq. mm) with the Number of cores (in Nos).

**5.** Material of conductor should be aluminium type with TYPE-C (heat resisting insulation) or PVC insulation type.

**6.** Type of armouring should be Galvanized steel formed wire (strip) armoured also the outer sheath of Type-ST 2 (Heat Resisting Insulation) or latest with fire improved quality as C2 - FR-LSH or better.

**7.** Shape of conductor should be stranded and provision of filler and inner sheath should be as per Cl. 5 of IS:1554 (Part 1):1988 latest.

**8.** Cable should be identified as per Cl. 17 of IS:1554 (Part 1):2011 latest and packing of it should be identify as per Cl. 18 of IS:1554 (Part 1):2011 latest.

**9.** Availability of type test report from Govt Lab/ NABL/ ILAC to prove conformity of the specification as per IS:1554 Part 1 latest

### **Digging of cable trench 450 x 1000 mm in RCC/PCC/hard soil.**

*This item includes excavation / digging of trench in cement Pebble block / CC Flooring for laying of cables on a bedding of sand at the bottom of the trench and covered the cable with layer of sand. The desired minimum depth of trench for laying cable shall be as under the minimum depth of trench for laying low voltage cable below 3.3 KV shall be 0.75 meter. For laying cable at Railway level crossing/track (shall be laid in RCC pipe / HDPE Pipe Grade PE- 80 & Class PN-4 of suitable Dia as per IS 4984-1995 or latest), the minimum depth from bottom of sleepers to the top of pipe shall be 01 meter. This also covers excavation of trench for laying of cable in all type of cemented flooring / Platform / Pebble block. In trench different sizes Cables shall be laid horizontally together & then all these cables shall be covered by 100mm thick*

layer sand at bottom & top of the cable. There is no need to keep bricks in Pucci trench. After laying the cable the trench should be refilled by Gittites (grommets) & reflooring by cement, sand mixture / Pebble block or as per site requirement. At locations where digging is not feasible, the scope will be made in proportional to actual depth & length dug and there is no need to keep bricks in trench where cable is passed though RCC pipe / HDPE Pipe / GI pipe.

**v Supply and laying of DWC Pipe complete**

This item covers supply and laying of DWC (Double walled corrugated) pipe as specification No. RDSO/SPN/204/2011 Ver.-1 or latest, anti-rodent and anti -oxidant and non-flame propagating type in 6 meters straight length and the following required quantity as per site requirement should also be supplied as required for the work as per the instruction of engineer in-charge: (1) Suitable snap fit couplers with rubber O ring. (2) Spacers. (3) Tees. (4) Bend. (5) End cap. (1 No. = 6 meters Straight pipe)

**Providing of self-drinking water cooler with (Non CFC refrigerant) energy efficient compressor cooling capacity 150 Liter. Per hrs. storage type, storage capacity 150 Liters. Rated of max. Energy consumption watt: 1550W**

This includes Providing (supply & erection) of self-drinking water cooler with (non-CFC refrigerant) energy efficient compressor cooling capacity 150 Litre. Per hrs., storage type, storage capacity 150 Liters. Rated of max. Energy consumption watt: 1550W. the scope also covers suitable size of Connecting pipes as per requirement.

Make: As per Make list.

**Supply & fixing of GI Box & modular switch board Modules.**

This includes supply of material fixing of G.I. Box Module with Modular Inner and outer cover plate combined to fix Modular fan regulator, switches sockets etc. complete with internal wiring. All cables are flexible copper conductor FRLS PVC insulated cable inside should be provided between switches & plugs. All points shall be provided with earth wire 1.5mm<sup>2</sup> flexible copper conductors PVC insulated FRLS cable green colour inside PVC pipe for earth and connected to general earthing arrangement. Board should be fixed on wooden Gittites with screws. The box cover plate should be white glazed finished or with matching colour of switch and socket. Make: -As per make list.

**Supply, erection, testing and commissioning of 18W LED smart round face or surface slim panel LED light 230V, 50Hz.**

This includes Supply, erection, testing and commissioning of 18W LED surface slim panel LED light 230V, 50Hz. Fitting shall have heat sink for efficient heat dissipation and with integrated electronic driver and Glare free diffuser. The fitting shall be guaranteed for satisfactorily performance and manufacturing defects for a period of 60 months i.e.5 year from the date of commissioning. Necessary documents / guarantee card shall be submitted during commissioning to the Rly. site engineer. The luminaries shall have minimum system efficacy 85 lumen/watt complied with LM 79 report. LM 80 report shall be as per L70 standard with Min. tested for 8000- 10000 Hrs. which confirms about 50000 burning hours of life and colour rendering index must be minimum 6000K. Necessary OEM's test certificate & LM79 report should have Manufacture name, Model No of Luminary asked, Make of LED used & LED Driver should be constant current, constant voltage type. SELV Driver under 60V will be accepting with short circuit, open circuit, over voltage, over current protection facility. LM 80 & LM 79 shall be submitted during supply for sample approval. NOTE: - All LED Fittings Shall be confirming to WR Specification No. WR/CCG/Specification/P/001 (Rev"1")/2018 of Dt . 28-02-2018. Specification i s a t t a c h e d separately. Necessary certificate /Test report must be submitted during sample approval mentioned in this specification.



**Supply, Installation, commissioning and testing (ICT) of charges for Industrial grade wall mounted AC of capacity 4.0 TR (2.0TR\* 2) (Twin type) indoor & outdoor.**

This item shall include supply, erection, testing and commissioning of Industrial grade wall mounted AC of capacity 4.0 TR (2.0TR\* 2) (Twin type) indoor & outdoor including all type of charges and it should be Twin circuit in Unitary type construction, wall mountable type with supporting foundation bolt & anti-vibration pad for machine installation. as per make: - Johnson Controls-Hitachi.

The design standards for AC should follows: -

Fan Motor - IDU	IS-996 -2009, with Amendment No. -1 or latest
Fan Motor - ODU	IS-996 -2009, with Amendment No. -1 or latest
Compressor	IEC60335-1:2004(Ed4.1) ARI or IS 10617 or similar Indian Standards
Internal Wiring/Cables	IS - 694-1990, IS-5831(1984) or latest for PVC
Capacitor	UL810, CSA C22.2 No 190- M1985 or latest
Performance Testing	<ol style="list-style-type: none"> <li>1. IS 8148 or equivalent</li> <li>2. Conducted Emission test (CE) as per CISPR 14-1, 1997 or latest</li> <li>3. Electrical Fast Transient (EFT) as per IEC 61000 - 4 - 4, 1995 or latest</li> <li>4. Radiated Susceptibility test as per IEC 61000 - 4 - 3, 1995 or latest</li> <li>5. Surge Immunity test as per IEC 61000 - 4 5, 1995 or latest</li> </ol>

The industrial AC should be 3150 Watt Maximum per unit of 2 TR capacity and 10%  $\pm$  variation. To change in voltage and operating conditions beyond design considerations or better with duty of machine should be 24x365 Days a year. It's rated voltage should be single phase 230V, 50Hz and total cooling capacity of 2x2 TR (2 Unit of 24000 BTU).

Note: - Before the supply it should be approved by the Dy.cee/C/RTM.

**v Supply & fixing of double pole modular MCB (SPN 6-32A) on existing board including connection.**

This includes Supply of material and fixing of Mini/ Modular Type Double pole MCB SPN 6- 32- amp Capacity in existing Main/ Sub board including connections. All materials shall be as per make list

**v Supply, fabrication, installation, testing and commissioning of 250A LT panel Board consisting incoming 4 pole 250A MCCB and outgoing 6x125A and 2x63A 4 pole MCCB.**

This item covers supply, erection, testing and commissioning of L.T. control panel front accessible type, cubical type, totally enclosed dust and vermin proof, fully compartmentalized with concealed type hinged covers on front and bolted covers on back side. All hinged doors and covers shall be provided with rubber gasket. The panel shall be fabricated with 2 mm thick M.S. sheet and base are to be made from channel at the bottom, suitable to support the entire panel. It shall undergo a process of degreasing, then sprayed with anti-corrosive primer and finally two coats of enamel paint. The structural members shall be designed in such a way to with stand mechanical and electrical stresses as well easy replacement with other standard make of MCCBs and MCBs without changing the design. The L.T. control panel shall comprise of; (A)INCOMING CIRCUIT.

(i) MCCB250Amps.415V, braking capacity ICS=100% ICU 35KA capacity 4 pole confirm to IS:13947-II 02 Nos Fixed magnetic setting and thermal setting with neutral link, HRC fuse and fuse links of suitable capacity. Similar to Harvell's catalogue No. LCNF0250 as per make list.

<p>(ii) Phase indication lamps. As reqd.</p> <p>(iii) Digital Voltmeter 0-500 volts, as per make list 01No.with selector switch as per make list,</p> <p>(iv) Digital Ampere meter 0-300 Amps as per make list with selector switch and CTs of suitable ratio.</p> <p>(v) Kit Kat fuse unit with HRC fuses for instrument protection 03 Nos.</p> <p><b>(B) OUT GOING CIRCUIT.</b></p> <p>(i) MCCB100Amps.415V,35KA capacity 3 pole 03 Nos. confirm to IS:13947-II Fixed magnetic setting and thermal setting with neutral link, HRC fuse and fuse links of suitable capacity. Similar to Harvell's catalogue No. LCNT0100 as per make list</p> <p>(ii) MCCB 63Amps.415V,35KA capacity 3 pole 03 Nos. confirm to IS:13947-II Fixed magnetic setting and thermal setting with neutral link, HRC fuse and fuse links of suitable capacity. Similar to Harvell's catalogue No. LCNT063 as per make list</p> <p>(iii) Indication lamps for each circuit. As reqd.</p> <p>(C) One set of 3 phase and neutral tinned plated electrolytic copper flat 40x5 mm bus bar with 0.2 mm thick 2.5 KV grade colour coated PVC insulated heat shrinkable sleeves on epoxy support insulators.</p> <p>(D) Internal wiring shall be done through copper stranded PVC insulated cables of suitable size with suitable copper terminal ends.</p> <p>(E) Copper bus bar for Earthing, Two Earthing terminals and Danger board.</p> <p>(F) Suitable Aluminium lugs and cable glands for all the incoming and outgoing cables.</p> <p>(G) The size of cable chambers shall be adequate and sufficient to accommodate and connect the various cables according to the rating of the MCCB's/MCB's provided in the panel and sufficient space shall be available from the point of view of maintenance.</p> <p>(H) Label for identification of each feeder.</p> <p>All sides of the bottom of the panel shall be covered with MS sheet of 2mm thick. Panel drg. Shall be approved before supply. All item shall be as per make list.</p>
<p><b>v Providing Distribution Board with incomer MCB DP, 16/32 Amp - 1 No, RCCB, 25 Amp - 1 No and outgoing MCB SP, 6/10/16 Amp - 4 Nos.</b></p>
<p>This includes supply, erection, testing, and commissioning of. LT Distribution Panel Company make, made from MS sheet indoor, wall mounting, double door type duly powders coated. The internal wiring of panel board shall be done with suitable size of flexible copper cable, MS glands of suitable size for incoming/outgoing cable &amp; panel to be secured on reg bolts. The danger board shall be fixed /provided on front cover. The incoming/ outgoing cable shall be provided with crimped terminal lugs. The board shall comprise of following:</p>
<p><b>v Supply and fixing of distribution board for AC control with time switch</b></p>
<p>This includes supply and fixing of Distribution Board suitable size fabricated from 18SWG MS sheet, two door type, Powder coated for AC control with time switch, wall mounting. The internal wiring of panel board shall be done with suitable size of flexible copper cable with suitable size of copper bus bar 3 PH+1N., MS glands of suitable size for incoming/outgoing cable &amp; panel to be secured on reblots. The danger board shall be fixed/provided on front cover. The incoming/ outgoing cable shall be provided with crimped terminal lugs. The board shall comprise of</p> <p>following: -</p> <p>Sr. Item Description Unit/Qty</p> <p>1. MCB -C series Double pole 20 Amps, 50Hz 03 Nos.</p> <p>2. Time switch 01 Nos.</p>

3. 3 Pole 25 Amp Heavy duty contractor 02 Nos.

4. Terminal connector 32 Amp 02 Nos.

Make: -

1. All MCB's shall be of HPL / HAVELLS / L&T / SIEMENS / CROMPTON / STANDARD / BCH / C&S / HAGER / LEGRAND / INDO ASIAN / BENLO make confirming to IS/IEC 60898-1. All electrical Accessories of ISI Marked.

2. PVC CABLE: The PVC cable for wiring shall be done by suitable Standard copper 1100 Volt grade conforming to IS 694 & of PARAGON \ FINOLEX \ KEI \ HAVELLS \ PARALITE \ EMPIRE \ POLYCAB \ HPL \ RR KABEL \ NEO-CAB \ NICCO \ ECOTEK \ ASIAN \ L&T \ AVOCAB \ ANCHOR make and ISI marked.

3. TIMER: Timer shall be from approved make list

4. CONTACTOR: Contactor shall be BCH, HAVELLS, C&S, GIC, INDO ASIAN. LEGRAND, SIEMENS, L&T,

**v Supply and laying of extra refrigeration pipe.**

This item covers supply, erection, testing and commissioning of extra Refrigeration gas pipeline  $\frac{1}{2}$ " &  $\frac{1}{4}$ " with insulation pipe and AC control cable indoor unit to outdoor unit and after laying of pipeline, cable these should be wrapped with insulation PVC paper tape. Refrigeration pipe line and Electrical cable. As per instruction of site in-charge.

**v Supply, Erection, testing & commissioning of ON Line UPS 2 KVA with isolation transformer suitable for single phase AC input and single phase output, floor mounted type Back up time -120 minutes.**

The contractor shall have to Supply, installation, testing and commissioning of 2 KVA, On-Line, single- phase input and single-phase output UPS suitable for 120-minute backup with maintenance free battery set as per RDSO specifications No. RDSO/PE/SPEC/PS/0023 - (Rev.0) 2001 with Amendment No.1 (Copy of the specification is available in the office of the Dy.CEE/C/RTM. Same can be purchased by the tenderer). If any doubt / dispute arises between the RDSO specifications & manufacturers specifications the decision given by the Dy.CEE/C/RTM shall be considered as final. The contractor shall have to submit the guarantee card for the period of 60 months. The Manufacturer shall be required to guarantee the performance of the equipment against unsatisfactory performance / break down. Installation of equipment or any part there of found defective within guarantee period shall be replaced by the manufacturer free of charge. The guarantee shall also cover quality, strength and performance of material and equipment used. The contractor shall have to arrange factory inspection of UPS by Railway Engineer at his own cost. During factory inspection all the parameters of UPS testing will have to be tabulated in a report form and signed by firm and Railway Engineer.

Note: - Make & Model shall be got approved from Dy.CEE (C) RTM before supply.

**v Supply. Erection. Testing & Commissioning of High Mast 16 mtr long complete with 300 W LED lights (6 nos), LA, aviation lights 18W LED-2 Nos etc. With double circuit for 50% lighting control with earthing and Control panel with Digital type timer 2 Nos having range for 24 hrs, 25x3mm for earth 2nos, nos, MCB TPN 63A-1no, DP MCB 32A-3nos, Winch motor 1HP-1no, SS rope suitable for lifting and lowering of light carriage of suitable length, control panel mounted MS frame of suitable size.**

This item covers Supply. Erection. Testing & Commissioning of High Mast 16 Mtrs long complete with 300 W LED lights (6 no's), LA, aviation lights 18W LED-2 Nos etc. With double circuit for 50% lighting control with earthing and Control panel with Digital type

timer 2 Nos having range for 24 hrs., 25x3mm for earth 2nos, MCB TPN 63A-1no, DP MCB 32A-3nos, which motor 1HP- 1no, SS rope suitable for lifting and lowering of light carriage of suitable length, control panel mounted MS frame of suitable size.

#### **TECHNICAL DATA FOR HIGH MAST**

##### **1) HIGH MAST STRUCTURE:**

- a) Height of Mast : 16 Mtrs.
- b) Material of construction : High tensile steel as per BS/ASTM/DIN Standard.
- c) Thickness in mm : Top 3 mm, Bottom 4 mm
- d) Cross section of Mast in : 18 sides (minimum) or more as per design Polygon
- e) No. of section of Mast : 02
- f) Type of joints : Telescopic stress fit (slip over joint system) with no circumferential weld
- g) Thickness of galvanization : Minimum 75 Microns
- h) Size of opening and door at base : Not less than 950 mm x 225 mm

##### **2) DYNAMIC LOADING:**

- a) Max. wind speed : 180 Km/hr.
- b) Factor of safety for wind load : More than 1:25
- c) Factor of safety for material : More than 1:15 (as per TR No.-7)

##### **3) FOUNDATION DETAILS:**

- a) Type of foundation : Open raft shallow RCC type
- b) Size of foundation : As per site conditions considered

##### **4) LANTERN CARRIAGE:**

- a) Material of construction : M.S (Hot dip galvanized)
- b) Buffer arrangement between : PVC sleeve mast Carriage & mast
- c) Type of fitting/fixture : 300 W LED light - 06 No

##### **5) WINCH:**

- a) Number of Winch per mast : One (Double drum)
- Method of operation : Manual / Electrical
- c) Gear material : Cast iron

##### **6) STAINLESS STEEL WIRE ROPES:**

<b>a)</b>	Grade	:	AISI 316 or better grade
<b>b)</b>	Number of ropes	:	Not less than 2 continuous ropes
<b>c)</b>	Construction	:	7 / 19 with central core SS
<b>d)</b>	center core materials	:	Stainless steel wire

##### **7) POWER TOOLS:**

<b>a)</b>	Power supply	:	3 phase, 415 Volts
<b>b)</b>	Remote control switch	:	
	i) Type	:	Push Button

	ii) Length of control cable	5/6 Mt. (Approx.) copper wound, multi core, Sheathed, round type at 2/3 Mtrs
<b>v Supply, erection, testing and commissioning of distribution box with 100Amps MCCB.</b>		
<p>This includes supply, testing, erection and commissioning of. LT Distribution Panel Company make, made from MS sheet indoor, wall mounting, double door type duly powder coated. The internal wiring of panel board shall be done with suitable size of flexible copper cable with suitable size of copper bus bar 3 PH+1N. MS glands of suitable size for incoming/outgoing cable &amp; panel to be secured on reg bolts. The danger board shall be fixed /provided on front cover. The incoming/ outgoing cable shall be provided with crimped terminal lugs. The board shall comprise of following: -</p>		
S N	Item Description	Unit / Qty.
A	Incoming Circuit	
1	MCCB Four Pole 100 Amps. 16 KA	01 Nos.
2	Earthing Terminals	02 Nos.
B	Outgoing Circuit	
1	MCB TP 32 Amps.	02 Nos.
2	MCB SP 6 to 32 Amps.	12Nos.
<p>Make: All Distribution panel shall be company make shall be of STANDARD/ HAVEELS ABB/LEGRAND/L&amp;T /SIEMENS / BCH / C&amp;S/ HAGER All Accessories of same make of Panel</p>		
<b>v Providing maintenance free earthing</b>		
<p>The price shall cover for providing maintenance free earthing as per the following specifications - 1. High tensile-low carbon steel rod having diameter not less than 17 mm complying with requirements of BS 4360 Grade 43A or EN10025:2-004S275JR, molecularly bonded by 99.99% pure high conductivity copper on outer surface with copper coating thickness of 250 micron or more, Length 3000 mm (minimum). Certificates from NABL approved labs shall be submitted with test results. 2.Copper earth bus-bar of size 250 mm x50 mm x 6 mm having electrical conductivity of 101% IACS, minimum99.9% copper content shall be exothermically welded to rod with 4 holes of 12 mm diameter (two on each side) for connecting earthing conductor.3. Earth Enhancement compound should have characteristics as mentioned in the RDSO specifications. It should have low resistivity preferably below 0.2 Ohm-meter, supplied in sealed bags (minimum 75kg per pit for 5' x 5' x 10' size pit and minimum 50 kg per pit for 300mm bore type pit).</p>		
<b>v Supply, erection, testing and commissioning of 70W LED flood/street light (IP65) complete including connection.</b>		

*This supply of LED street light fitting 70 Watt +10% Watt complete with all accessories. The fitting shall be Pressure die cast aluminium IP65 roadway luminaries with Toughened Glass, water proof & suitable for outdoor location. The fitting shall be guaranteed for satisfactorily performance and manufacturing defects for a period of 60 months i.e. 5 year from the date of commissioning. Necessary documents / guarantee card shall be submitted during commissioning to the Rly. site engineer. The Street Light luminaries shall have minimum system efficacy 100 lumen/watt complied with LM 79 report. LM 80 report shall be as per L70 standard with Min. tested for 8000- 10000 Hrs. which confirms about 50000 burning hours of life and colour rendering index must be minimum 6000K. Necessary OEM's test certificate & LM79 report should have Manufacture name, Model No of Luminary asked, Make of LED used & LED Driver should be constant current, constant voltage type. SELV Driver under 60V will be accepting with short circuit, open circuit, over voltage, over current protection facility. LM 80 & LM 79 shall be submitted during supply for sample approval and Erection, testing & commissioning of LED Flood light fitting 70 Watt complete with all accessories. The fitting shall be fixed/ mounted on octagonal pole / Beam / Structure/ Building/Rail Pole with suitable bracket and clamps duly painted & hardware including connection from junction box / Ceiling Rose to fitting by minimum 3 core 0.5 Sq. mm. PVC copper Cable. The PVC bushes/ rubber grommets shall be provided on bracket at cable entries. Separately NOTE: - All LED Fittings Shall be confirming to WR Specification No. WR/CCG/Specification/P/001 (Rev"1")/2018 of Dt. 28-02-2018. Specification is attached separately. Necessary certificate /Test report must be submitted during sample approval mentioned in this specification.*

**v Laying of cable and commissioning of LT cable as per instruction Engineer in charge.**

*This includes laying of 1100V grade, PVC insulated Armoured aluminium Circular armoured AL. PVC 1100 V grade Cable in pipe/ trench/ walls/ poles/ Platform shed/ trays properly secured etc. including connections at both ends along with suitable type or size lugs, bolts etc. At locations where cable is passed through pipes on walls/poles the same shall be secured with MS clamps of suitable size and hardware (minimum two clamps) and above pipe Cable on shall be secured with suitable size of MS Clamps .and Cable shall be provided with glands at the entrance of cable in panel junction box etc. The end of cable lead shall be proper lugged as per site requirement. The various sizes LT armoured cables will be issued by Railway at the store depot of SSE-Stores (Power-GS) RTM free of cost, Necessary arrangements shall be made by contractor for loading and transportation of cables to site.*

**v Supply & erection of octagonal pole single/double arm completes with foundation.**

*This item covers Supply of galvanized octagonal steel pole, as per schedule with one Meters. long arm. The pole shall be hot dipped galvanized external and internal by single dipping method in accordance with IS 2629 or equivalent up to 65 microns DFT and should have on longitudinal weld and should be in one section designed for basic wind speed of 169 KMPH with mounting bracket type as per following specification.*

**TECHNICAL SPECIFICATIONS OF GALVANIZED OCTAGONAL POLES**

**Design:** - The Octagonal Poles shall be designed to withstand the maximum wind speed as per IS 875. The top loading i.e. area and the weight of fixtures are to be considered to calculate maximum deflection of the pole and the same shall meet the requirement of BSEN 40-3-3:2003.

**Pole Shaft:** - The pole shaft shall have octagonal cross section and shall be continuously tapered with single longitudinal welding. There shall not be any circumferential welding. The welding of pole shaft shall be done by Submerged Arc Welding (SAW) process. All

octagonal pole shafts shall be provided with the rigid flange plate of suitable thickness with provision for fixing 4 foundation bolts. This base plate shall be fillet welded to the pole shaft both inside and outside. The welding shall be done as per qualified GMAW process approved by Third Party Inspection Agency

**Door opening:** - The octagonal Poles shall have door of approximate 500 mm length at the elevation of 500 mm from the Base plate. The door shall be vandal resistance and shall be weather proof to ensure safety of inside connections. The door shall be flush with the exterior surface and shall have suitable locking arrangement. There shall also be suitable arrangement for the purpose of earthing. The pole shall be adequately strengthened at the location of the door to compensate for the loss in section.

**Material:** - Octagonal Poles HT Steel Conforming to grade S355. Base Plate Fe 410 conforming to IS 2062 Foundation Bolts EN 8 grade Bracket ERW tubes as per IS 1161

**Welding:** - The welding shall be carried out confirming to approved procedures duly qualified by third party inspection agency. The welders shall also be qualified for welding the octagonal shafts.

**Bracket Arm:** - The bracket will have a sleeve as cap of suitable Diameter fitted with pinching bolts. The length of bracket shall be as per illumination design.

**Galvanization:** - The poles shall be hot dip galvanized in single dipping as per BSEN ISO 1461 standards with average coating thickness of 70 micron.

**Fixing Type:** - The Octagonal Poles shall be bolted on a pre-cast foundation with four foundation bolts for greater rigidity.

**Top Mountings:** - The galvanized mounting bracket shall be supplied along with the Octagonal Poles for installation of the luminaries.

**Manufacturing:** - The pole manufacturing & galvanizing unit shall be ISO 9001: 2000, ISO 14001 & 18001 OSHAS certified to ensure consistent quality & environmental protection.

**Pole Testing Facility:** - The manufacturing unit shall have in-house pole testing facility for validation of structural design data. The pole testing facility shall conform to BS EN 40-3-2-2000 part 3-2.

**Certification:** - The manufacturing unit is having ISO 14001, ISO 18001 and OSHAS certifications.

**Foundation:** Construction of suitable shallow foundation with 1:2:4 concrete for the octagonal pole 1 meter  $\pm 10\%$  depth with all materials and labour with 3 days curing.

**Galvanized octagonal steel pole Make shall be as per make list.**

**v Supply, installation, testing and commissioning of LED light name boards having Station/ Zonal training centre Names in English and Hindi Languages for total of 2 boards each station with Indian Railway logo and as per specifications.**

This includes supply of material, erection, testing and commissioning of LED Based name board in Hindi as per specification below SPECIFICATION FOR LED BASED NAME BOARD: Design, development and Supply, Fixing, testing and commissioning of LED Based Name board in English & Hindi language.

Technical specification / salient features:

1. Power supply System: - It should be as under. Input: 230 Volt single phase A.C  $\pm 5\%$

Output: 12 Volt D.C

2. Letters in Hindi languages

a) Letters for name board shall be made in Hindi & English (CAPITAL LETTERS).

b) Substrate material used for the front portion of channel letter shall be 3 mm thick acrylic sheet RED Colour.

c) Hindi word "Letter size 24" for stations and width of letter should be in proportionate to the height

- d) Depth of each letter should not be less than 3"
- e) Back of letter should be of 28 SWG powder coated sheet.
- f) Front & back of letters should be assembled in such a fashion that it remains water tight, Dust proof.
- g) Front & back of letters should be jointed / tighten with steel screw and washers, so that it may be opened in case of failure or for maintenance.
- h) All letters of each location should be fitted suitably on 3mm thick ALUMINUM PANEL Sheet and back ground shall be Bright silver/White sheet as per instruction of site supervisor, if required and this sheet to be fixed suitably on above M.S. Structure.
- i) Complete name board should be fixed on a M.S. Iron frame structure suitable size to withstand the atmospheric weather wind pressure etc.
- j) M.S. Structure should be grouted well with appropriated cement, concrete mixture at given Location.

3. L.E.D (Water proof 3-Diode Module); - Each letter to be fitted with these modules on the inside of back cover of letter in such a fashion so that module may be removed / replaced if required / pasted and should be following characteristics for RED color.

- The alphabets will have to be back-lit using LED Module arrays comprising RED LEDs Module will have a 2-wire bus LED Make shall be NICHIA/ CREE/ OSRAM/ SEOUL/ PHILIPSLUMILEDS /LEDNIUM /AVAGO /SAMSUNG.

4) Switch Mode Power supply.

a) The power supply system (SMPS) along with transformer etc. for complete station name board should be of company made.

b) It should be in accordance to requirement.

c) It should be housed in a M.S. Box which should be vermin, dust and water proof.

This box should be lockable and fixed at proper place from safety point of view

**v Supply Installation Testing & Commissioning of Signage board LED (Glow sign) size 24"x24"x6" or 48"x12"x6.**

The price shall cover for supply, fixing, testing & commissioning of new LED glow sign boards made out of 2 mm white acrylic sheet with vinyl pasting. The LED Glow Sign Board shall be of 24" x 24"x6" or 48"x12"x6" size as per site requirement & shall be visible from both sides and well supported and the structure should be prepared to bear wind pressure and also self-weight. Before manufacturing, the structural design should be got approved from Dy.CEE/C/RTM. The board Frame shall be made from 22 SWG G.I. sheet duly painted by black enamelled paint from outside and white name led paint inside The Acrylic sheet shall be fixed between duly fabricated G.I. square section and from the top it should be supported by S.S angle of size approx. 25mm x 25mm and will be fixed by screw. The board should be illuminated from inside by providing with LED Lamp of minimum 04 Nos. 5 watts on 4 sides of make Philips/ Wipro / Bajaj / Osram / GE / Surya / HAVELLS/C&S with internal wiring & holder etc. The board shall be designed to provide uniform brightness & readable from a distance of 15 meters. The Board shall be provided with internal wiring by 1mm<sup>2</sup> PVC copper cable in suitable size casing capping. A connector strip of Bakelite material of 16-amp capacity duly fixed in the board and shall have provision of PVC/Rubber Grommet for further connection. Provision shall also be made for 01 earth terminal & suitable no's of louvers on both sides for proper heat dissipation. A wire mesh shall also be provided to prevent entry of lizard & other insects. The matter, size of letter, language & color code of signage board to be digitally printed vinyl sheet sticker on the flex shall be given by the concerned Field Supervisor and shall be got approved by Dy.CEE/C/RTM before commissioning. The board shall be fixed/hanged using a suitable size of clamp made from GI flat strip or steel chain in the platform cover shed as per site condition and connection to be given by a 3 core PVC



insulated copper flexible cable of 24/0.20 mm size through a PVC flexible pipe from the existing Junction Box of catenaries /ceiling rose point. The matter and colour will be as decided by Railway authorities as per actual site requirement.
<b>v Supply &amp; laying of perforated GI cable Tray with cover and fixing arrangement</b>
<p>The contractor shall have to supply and fix the perforated GI tray on Wall/ roof/as per site requirement for able laying.</p> <ol style="list-style-type: none"> <li>1.The fixing arrangement shall be robust and the fixing shall have to be done by Angle at an interval of minimum 1.5-meter, nut, bolt, clamp or welding on Wall/ roof/as per site requirement.</li> <li>2.Cable tray perforated shall be 2.5 mm thick minimum with cover. In case non-availability of the required size next higher size can be used.</li> <li>3.The cable tray shall be firmly fixed /supported on the Wall/ roof/as per site requirement.</li> <li>4.The design&amp; fixing arrangement shall have to be approved by Railway before fabrication and installation. Provide proper clamping arrangement for cables laid on it.</li> </ol>
<b>v Supply of material and wiring of light point/ fan point/ ceiling rose point by 1.5 mm<sup>2</sup> copper PVC cable in PVC casing capping/ PVC pipe with earth wire without switch.</b>
<p>This item includes supply of all materials and wiring of light/fan point as per IS with 1.5mm<sup>2</sup> Single core Copper stranded FRLS PVC insulated unsheathed cables ISI marked and PVC copper stranded earth wire 1.5mm<sup>2</sup> in heavy duty PVC casing capping / pipe of 25mm size cream/ash colour complete with supply &amp; fixing 2 plate ceiling rose on PVC square block of suitable size. All materials shall be as per make list.</p> <p>NOTE: - Wiring of light /fan point for platforms.</p>
<b>v Supply, erection, testing and commissioning of LED tube light 18-20 watt including connection.</b>
<p>This includes supply of material 18-20 batten fitting 4Feet long with 18–20-Watt LED retrofit tube rod. Fitting shall have extruded aluminium heat sink for efficient heat dissipation and with integrated electronic driver and Glare free diffuser. The fitting shall be guaranteed for satisfactorily performance and manufacturing defects for a period of 60 months i.e.5 year from the date of commissioning. Necessary documents / guarantee card shall be submitted during commissioning to the Rly. site engineer. The luminaries shall have minimum system efficacy 85 lumen/watt complied with LM 79 report. LM 80 report shall be as per L70 standard with Min. tested for 8000- 10000 Hrs. which confirms about 50000 burning hours of life and colour rendering index must be minimum 6000K. Necessary OEM's test certificate &amp; LM79 report should have Manufacture name, Model No of Luminary asked, Make of LED used &amp; LED Driver should be constant current, constant voltage type. SELV Driver under 60V will be accepting with short circuit, open circuit, over voltage, over current protection facility. LM 80 &amp;LM 79 shall be submitted during supply for sample approval.</p> <p>NOTE: - All LED Fittings Shall be confirmed to WR Specification No. WR/CCG/Specification/P/001 (Rev"1")/2018 of Dt. 28-02-2018.Specification is attached separately. Necessary certificate /Test report must be submitted during sample approval mentioned in this specification. And installation, testing &amp; commissioning of 18-20 batten fitting 4Feet long with 18–20-Watt LED retrofit tube rod including connection from ceiling rose. The fitting shall be fixed on two round blocks/ square PVC block on wall &amp; connected by minimum 3core 0.5 Sq. mm. PVC flexible cable from existing ceiling rose.</p>
<b>v Supply of material &amp; wiring of sub-main by PVC copper cable, 2x4.0 sq.mm with earth wire in PVC casing-capping/ PVC pipe including connection.</b>
<p>This includes supply of material &amp; wiring by 2x4.0mm<sup>2</sup> single core copper stranded PVC insulated FRLS cable in separate or existing PVC pipe / PVC casing capping from one board to</p>

<p>another with separate earth wire 4.0 mm<sup>2</sup> flexible copper conductor PVC insulated FRLS cable green Colour inside PVC pipe /PVC casing-capping for earth and connected to general earthing arrangement.</p>
<p><b>v Supply of Material Erection, testing &amp; Commissioning of cable junction box IP 65/66 with 4 No copper bus bar.</b></p>
<p>This includes supply, erection, testing and commissioning of thermoplastic IP 65/66 cable Junction box size 260 x 210 x 116 mm (± 5% of Size), Halogen free &amp; weather proof for outdoor installations with metric knockouts for cable entry with supply and fixing of 04 Nos. copper Bus bars of 15mm X3mm size, suitable for 16/25mm<sup>2</sup> cable with lead sealing and with lug arrangement at each cable ends &amp; labelling for circuit system. Junction boxes to be fixed on the pole/ Covering shed with two Nos. clamps of suitable size. Make: - Hensel, GE Vynecker, Spielberg &amp; Neptune Bals.</p>
<p><b>v Supply of Material Erection, testing &amp; Commissioning of cable junction box IP 65/66 with 5 No 16 Amp. Cut out.</b></p>
<p>This includes supply, erection, testing and commissioning of thermoplastic cable junction box Halogen free &amp; weather proof for outdoor installations with metric knockouts for cable entry, IP65/66 Junction box size 260 x 210 x 116 mm (± 5% of Size) with supply and fixing of 16 Amp. 05 Nos. Cutouts and neutral link of 15mm X 3mm size. Junction boxes to be fixed on the pole/Covering shed with two Nos. clamps of suitable size. Make: - Hensel, Rittal, Schneider, GE V-necked &amp; Spielberg</p>
<p><b>v Supply and providing 32A DP switch with NEON indication.</b></p>
<p>The contractor shall have to supply, erection, testing &amp; commissioning of 32A DP Switch with NEON indication. Provide on wooden board nearby Energy meter. Make as per list enclosed and shall be got approved from Dy.CEE (C) RTM before supply. Note- Contractor shall provide big common wooden board for Energy meter &amp; DP switch if required in multi-story buildings ground floor.</p>
<p><b>v Supply, fixing, testing &amp; commissioning of modular type electronic fan regulator.</b></p>
<p>The scope shall cover supply, erection, testing and commissioning of humbles electronic fan regulator having five speed control arrangements or smooth speed control arrangement can be fixed on existing board suitable for Single phase, 230V AC, 50Hz supply. Electronic Fan regulator shall be from approved make list.</p>
<p><b>v Fixing testing &amp; commissioning of 1200mm sweep ceiling fan.</b></p>
<p>This includes Supply, erection, testing and commissioning of Energy efficient Electric Ceiling Fan Capacitor type sweep 1200mm White colour, double ball bearing, canopies with down rods and other Accessories, suitable for operation in single phase, 230 Volt AC, 50Hz supply. All materials shall be as per make list</p>
<p><b>v Supply of material &amp; concealed wiring of modular plug socket 16/6A cap. With modular switch 16A by 4.0 sq.mm PVC wire including PVC pipe, earth wire &amp; connection work.</b></p>
<p>This includes supply of material &amp; commissioning one modular 6 pin, 6/16 Amps socket with separate switch including wiring in PVC casing/ capping more size wherever required in casing/ capping manner by 2x4Sq. mm single core copper stranded PVC insulated FRLS cable with 4 Sq. mm flexible copper conductor, PVC insulated FRLS cable green colour for separate earth wire, in separate Surface mounting plastic board with modular cover Plate of suitable Module. PVC box shall be as per IS14772. All cables are 4mm<sup>2</sup> flexible copper conductor FRLS PVC insulated cable inside should be provided between switches &amp; plugs. Board should be fixed on wooden Gittites/ PVC rowel plug with screws. The board &amp; Cover plate shall be Off</p>

white / White Colour. Modular Cover plate shall be glaze finished. All materials shall be as per make list.
v <b>Supply of material &amp; wiring of modular plug socket 6A, 3pin, 5 PIN with switch &amp; wiring on existing board by 2x2.5 sq.mm PVC copper cable including connection.</b>
This includes supply of material, fixing and commissioning of modular 6 Amps 3 Pin socket with separate modular switch on existing board (Casing capping) including connections. All cables are 2.5mm <sup>2</sup> flexible copper conductor FRLS PVC insulated cable inside should be provided switches & plugs. All materials shall be as per make list.
v <b>Supply of material &amp; concealed wiring of modular plug socket 6A, 3pin, 5 PIN with switch &amp; wiring on separate board by 2x2.5 sq.mm PVC copper cable including connection &amp; PVC pipe.</b>
This includes supply of material & commissioning one modular 3pin, 6 Amps socket with separate modular switch including casing/ capping wiring in PVC conduit pipe of minimum 2mm thick 25 mm size or more size wherever required in concealed manner by 2x2.5 Sq. mm single core copper stranded PVC insulated FRLS cable with 2.5 Sq. mm flexible copper conductor, PVC insulated FRLS cable green colour for separate earth wire in separate Surface mounting plastic board with modular cover Plate of suitable Module. PVC box shall be as per IS14772. All cables are 2.5mm <sup>2</sup> flexible copper conductor FRLS PVC insulated cable inside should be provided switches & plugs. Board should be fixed on wooden Gittites /PVC rowel plug with screws. The board & Cover plate shall be Off white / White Colour. Modular Cover plate shall be glaze finished. All materials shall be as per make list.
<b>Supply of material &amp; concealed wiring of sub- main by PVC copper cable, 2x2.5, 2x4.0 &amp; 2x6.0 sq.mm with earth wire in PVC pipe including connection.</b>
This includes supply of material & wiring by single core copper stranded PVC insulated FRLS cable in separate or existing PVC pipe / PVC casing capping from one board to another with separate earth wire 2.5mm <sup>2</sup> flexible copper conductor PVC insulated FRLS cable green Colour inside PVC pipe /PVC casing-capping for earth and connected to general earthing arrangement. All materials shall be as per make list.
v <b>Supply, erection, testing and commissioning of 9 to 11 watt LED Lamp.</b>
The price shall include supply and erection of 9-11 W LED lamp of Philips, Crompton, Syska, HPL, Bajaj make.
v <b>Supply, erection, testing &amp; commissioning of 300 mm exhaust fan.</b>
This item includes supply, fixing and commissioning of heavy-duty exhaust fan having 300 mm sweep on Rag-bolts including connection by 3 core flexible PVC copper cable (white/grey colour) from existing ceiling rose. Exhaust fan shall be as per make list.
v <b>Supply, installation, testing &amp; commissioning of 38-45 system watt LED street light fitting.</b>
This includes supply of LED street light fitting 38-45 Watt complete with all accessories. The fitting shall be Pressure die cast aluminium IP65 roadway luminaries with Toughened Glass, water proof & suitable for outdoor location. The fitting shall be guaranteed for satisfactorily performance and manufacturing defects for a period of 60 months i.e.5 year from the date of commissioning.
Necessary documents / guarantee card shall be submitted during commissioning to the Rly. Site engineer. The Street Light luminaries shall have minimum system efficacy 100 lumen/watt complied with LM 79 report. LM 80 report shall be as per L70 standard with Min. tested for 8000- 10000 Hrs which confirms about 50000 burning hours of life and colour rendering index must be minimum 6000K. Necessary OEM's test certificate & LM79 report should have

Manufacture name, Model No of Luminary asked, Make of LED used & LED Driver should be constant current, constant voltage type. SELV Driver under 60V will be accepting with short circuit, open circuit, over voltage, over current protection facility. LM 80 & LM 79 shall be submitted during supply for sample approval.

NOTE: - All LED Fittings Shall be confirming to WR Specification No. WR/CCG/Specification/P/001 (Rev"1")/2018 of Dt. 28-02-2018. Specification is attached separately. Necessary certificate /Test report must be submitted during sample approval mentioned in this specification and erection, testing & commissioning of LED street light fitting 38-45 Watt complete with all accessories. The fitting shall be fixed/ mounted on octagonal pole / Beam / Structure/ Building/Rail Pole with suitable bracket and clamps duly painted & hardware including connection from junction box / Ceiling Rose to fitting by minimum 3core 0.5 Sq. mm. PVC copper Cable. The PVC bushes/ rubber grommets shall be provided on bracket at cable entries. Separately.

**v Supply & fixing of Junction box. 2 CUT OUT**

This includes supply, erection, testing and commissioning of thermoplastic cable junction box Halogen free & weather proof for outdoor installations with metric knockouts for cable entry, IP65/66 Junction box size 260 x 210 x 116 mm ( $\pm 5\%$  of Size) with supply and fixing of 16 Amp.05 Nos. Cutouts and neutral link of 15mm X 3mm size. Junction boxes to be fixed on the pole/Covering shed with two Nos. clamps of suitable size.

Make: - Hensel, Rittal, Schneider, GE Vynecker & Spelsberg

**v Supply, erection, testing and commissioning of Geyser 15 Liters. Capacity**

This includes supply and erection of Automatic instant type geyser 15 Litre. capacity ISI mark 230V AC 50 Hz. with auto thermostat thermal cut-in cut-off and confirming to relevant IS. The price also covers supply and fixing of necessary fixing arrangement of geyser including fasteners, clamps and connecting pipe of suitable size etc. Make: As per Make list.

**v Supply and fixing of 63A distribution box.**

This includes supply, erection, testing, and commissioning of. LT Distribution Panel Company make, made from MS sheet indoor, wall mounting, double door type duly powders coated. The internal wiring of panel board shall be done with suitable size of flexible copper cable, MS glands of suitable size for incoming/outgoing cable & panel to be secured on reg bolts. The danger board shall be fixed /provided on front cover. The incoming/ outgoing cable shall be provided with crimped terminal lugs. The board shall comprise of following: -

Sr.	Item Description	Unit/Qty	Note: All material shall be as per make list
A	Incoming circuit		
I	MCB 3 pole 63 Amps, 50Hz	- 01 Nos. or as per requirement	
II	Earthing terminals	- 02 Nos or as per requirement	
B	Outgoing Circuit		
I	MCB SP 6 to 32 Amp, 50Hz	06 Nos or as per requirement	

**v Supply, testing and commissioning of pump set including all fittings and accessories along with wiring work and electrification work.**

The scope shall include 3- $\Phi$  vertical submersible pump motor set with rating of 415V, 50Hz, AC for 135mtr duty point head at discharge 90LPM minimum 5- star rating with all accessories and Pump Motor shall be energy efficient in terms of HP, Head, Discharge / efficiency with 5star rating by BEE. The scope also includes starter panel fabricated from 18 gauge MS sheet along with minimum Size of 20 x 13 x 20 inches. The control panel should consist of following components: - Main MCB triple pole 32 Amp. (Siemens, BCH, Havells, C&S, ABB, Schneider) Suitable for Inductive load C curve type. Main contractor 22A with 02NO+02NC (Siemens, ABB, HPL, BCH, TC, Schneider) All contactor shall be AC-3 duty ratings. Overload relay, phase failure, unbalance, Phase sequence reversal, UV, OV protection with SPP with dry running (under current setting is adjustable & by pass features when to be used for motors operating on NO load currents. Three over load characteristics (2sec, 5sec, 10 sec) are selectable relay required with 2 change over output relay outputs (Model Minilec:- S2CMR1/D2MPR3 or Gelco, SUN) with appropriate CTs of same make (Minimum 20/5A) AC Three Phase Electronic Panel mounted multi-function meter, 3Lines LCD Display in 96X96 Sq mm, Flush mounted case, Accuracy class 1.0 emissive Water level Guard with probe with dual level monitoring & complete installation (Minilec, Gelco) Hour meter of suitable capacity, size and shape. (Conzerv, Nippen, MECO, GELCO, L&T) Indicator lamps for R Y B phase, overload, run. Push buttons are provided to start & stop. Toggle switch double pole ON- OFF- ON for auto or manual operation includes HDPE pipe PE 63 grade 32 mm Dia 10 kg pressure suitable 3.6-4.2 mm thickness PN 10 for Vertical Submersible pump set in the borewell/open well etc. and cable should be suitable for pump set or should be permitted by railway official before execution.

**Supply and erection of Illuminated Escape Route Orientation Sign**

The scope includes supply, fixing, testing and commissioning of illuminated escape route orientation sign complete with LED illumination arrangement, housing, display panel, mounting accessories, wiring and all associated materials required for proper visibility and emergency guidance during evacuation, conforming to relevant IS standards, fire safety requirements and approved technical specifications.

Prior approval from Dy.CEE/C shall be obtained before supply.

**Supply and erection of Illuminated Escape Route Orientation Sign Controller**

The scope shall include supply, installing, testing and commissioning of illuminated escape route orientation sign controller complete with control circuitry, power supply arrangement, monitoring and interface components, termination accessories and all associated hardware required for proper operation and control of escape route orientation signage system and conforming to relevant technical specifications.

Prior approval from Dy.CEE/C shall be obtained before supply.

**Supply and erection of CN Distribution Panel**

The scope includes Design, fabrication, supply, installation, testing and commissioning of Communication Network Distribution Panel complete with incoming and outgoing feeders, protection devices, internal wiring, terminal blocks, indication arrangements, earthing provisions and all associated accessories required for reliable power distribution and operation of communication/networking equipment and conforming to approved technical specifications.

Prior approval from Dy.CEE/C shall be obtained before supply.

**MAKE – LIST****Approved Make of Various Electrical Items (Power/General Service)**

Ref: - As per CEE/C/CCG's letter no. EL-93/11/3/C Vol. VIII Dtd. 22/01/2018

01	Transformer	Areva, ABB, Emco, Crompton, BHEL, Volt Amp. , Kirloskar, Bharat Bijlee, NGEF, Voltas, GEC, Tesla, Siemens, Western Electric, IMP, Vivekanand, RTS, National
02	DG set Silent	Cummins, Kirlosker Green, Caterpiliar, Greaves-Cotton , Ashok Leyland, Mahindra, TATA, Panta Volvo.
03	A.C. Unit (Window/Split)	Hitachi, LG, Samsung, Voltas, Blue star, Carrier, Fedders lioyad, Videocon, Godrej, Onida, Toshiba. Panasonic, Haier, O'General, Daikin.
04	All types of Fans	Crompton, Usha, GEC, Almonard, Khaitan, Bajaj, Havells, Orient , Anchor, Polar, Alfa, Inova, Unique.
05	Water Heaters/Gyser	Venus, Bajaj, Recold, Voltas, Ditz, Crompton, Usha, Havells, Spherehot.
06	Water Cooler	Blue Star, Voltas, Usha, Fedder Llyod.
07	Motor & Pump sets	Kirloskar, Crompton, Siemens, NGEF, KSB, Taxmo, ABB, Jhonson, Jyoti, shakti, Beacon, Calama, Amrut, Sriram, Lubi, KDS
08	Electrical Switch gear & Relays	L&T, GE, Siemens, Indo Asian, Havells, ABB, Crompton, Schneider, C&S, HPL, Beicco Lawrie, Voltas, BHEL, AREVA, Legrand, BCH, Standard, Bentec, MEL, Jyoti
09	GI Octagonal pole/ High Mast	Bajaj, PHILIPS, CROMPTON, BPP, UTKARSH, TRANSRAIL
10	LED Luminaries	As per CEE/WR spec. WR/CCG/Specification/P/001 (Rev-01) - 2018 of Dt. 28-02-2018. (Ref. RDSO specification nO. RDSO/PE/SPEC/PS/0123 (Rev-0)-2009 with amendment-1.
11	Lead Acid Battery	Amar Raja, Excide, CSB, Hitachi, Okaya, Panasonic, Luminous, Amron
12	Modular Switches/Fan regulators/socket and accessories	Anchor/Roma, Cona, Leader, Crabtree, Legrand, C&S, HPL, Indo Asian, Havells, Standard, Bentec, Elleys, Precision
13	LT/HT Joints & End Termination	Raychem, Denson, M-Seal, 3M, CCI, Mahindra & Mahindra
14	Copper wire/PVC casing caping/ PVC Conduit	ISI Mark confirming to relevant IS with approval of officer in charge
	For all other items not included specifically in above list, contractor shall supply material as per relevant Standard as indicated in the tender with approval of Officer-in-charge.	

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 FOBs	Contractor	CE/C (30 days)	
14.	Engineering Scale Plans (ESPs)	Contractor	<b>CE/C (45 days)</b>	Tentative ESP copy enclosed with RFP.
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.
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.
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)	

**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.	General Power Supply diagram	Contractor	CEE(C), CEDE/WR, (45 days)	Approval of HQ
2.	Sectioning cum Wiring Diagram	Contractor	CTPM/CCG, CEDE/WR, CEE(C) (45 days)	Approval of HQ



3.	Final Layout Plan (LOP)	Contractor	Dy.CEE(C) (21 days)	NIL
4.	Cross Sectioning Drawings (CSD)	Contractor	Dy.CEE(C) (21 days)	NIL
5.	Structure Erection Drawings (SED)	Contractor	Dy.CEE(C) (21 days)	NIL
6.	Long Section drawings of OHE under over line structures and overhead crossings	Contractor	Dy.CEE(C) (21 days)	NIL
7.	Other design and drawings where there is any deviation from RDSO standards	Contractor	Dy.CEE(C) (15 days)	NIL
8.	As erected SED and CSD	Contractor	Dy.CEE(C) (30 days)	NIL
9.	Any special arrangement, including bridge masts, FOB/ROB modification, or structural modifications.	Contractor	CEE(C) (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) within 30 days)
10.	All PSI Drawings/Designs	Contractor	Dy.CEE(C) (21 days)	NIL
11.	Relay setting calculation of TSS	Contractor	CEE(C) (21 days)	NA
12.	HT Crossing and LT crossing modifications	Contractor	Dy.CEE(C) (21 days)	Sr DEE(TRD) of concerned Division (Review and return to Dy.CEE(C) within 30 days).
13.	Bonding Plan of Yard Area	Contractor	Dy.CEE(C), Dy.CSTE(C) (28 days)	Sr DEE(TRD) of concerned Division (Review and return within 21 days to Dy.CEE(C))
14.	All other drawings not mentioned above, where mandatory review by Railway is necessary to comply with provision of Manuals/Codes.	Contractor	21 days where CEE(C) is the 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:
  - 1.2
    - (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.
  - 1.3 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.
  - 1.4 All conditions as imposed by Forest department under Annex IV Sch A Environmental and Forest clearances to be strictly adhered to by contractor.

SCHEDULE - F  
(See Clauses 7.1.1, 7.5.3 and 17.2)  
**FORM OF BANK GUARANTEE**

Annex-I  
(See Clauses 7.1.1)  
**Performance Security**

[The General Manager], West Railway,  
Churchgate Mumbai

**FA & CAO/C, Churchgate Mumbai,  
WR**

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 \*\*\*\*<sup>\$</sup>**. 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

<sup>\$</sup> Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 of the Agreement).

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:

1. (Signature)

(Name)

(Designation)

(CodeNumber)

(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.

## 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 Engineering/Const  
Churchgate Mumbai, WRBeneficiary : **Dy FA & CAO/C,****Ratlam, WR**

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

**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.

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 the 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@sbigeneral.in]

Place.....

Bank's Seal and authorized signature(s)

[Name in Block letters].....

[Designation with Code No.].....

[P/Attorney] No

Annex – II  
(Schedule - F)  
(See Clause 7.5.3)

**Form of Guarantee for Withdrawal of Retention Money**

[General Manager,\*\*\*\*\*

\*\*\*\*Railway,  
.....]

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 The issuing branch should be mentioned on the covering letter of the issuing branch.

Annex – III  
(Schedule - F)  
(See Clause 17.2)

**Form of Guarantee for Advance Payment**

[\*\*\*], [\*\*\*]Railway,

[Mumbai-].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. (Rupees .....crore) 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 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 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

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§The Guarantee Amount should be equivalent to 110% of the value of the applicable installment.

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 \*\*\*\*.<sup>s</sup> 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

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 .....

\_\_\_\_\_

<sup>§</sup> 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).

**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 the issuing branch should be mentioned on the covering letter of the issuing branch.



SCHEDULE - G

*(See Clauses 10.1.4 and 17.3)*

**Contract Price Weightages[(For Lump sum value of this agreement)]**

1.1 The Contract Price for this schedule of Agreement is **Rs. 509,02,24,100.97/-**

[It is assigned for different components of the Railway Project as follows:]

**[For works consisting of civil works]**

<b>Component</b>	<b>Approximate Cost (Rs)</b>
<b>Civil works</b>	<b>Rs. 487,07,47,718.00/- (95.69%)</b>
<b>Electrification related civil works</b>	<b>Rs. 21,94,76,382.97/- (4.31%)</b>
<b>TOTAL</b>	<b>Rs. 509,02,24,100.97/- (100.00%)</b>

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

<b>1. Civil and track works</b>				
<b>Item</b>	<b>Weightage in percentage to the Contract Price</b>	<b>Stage for Payment</b>	<b>Percentage weightage</b>	<b>Payment Procedure</b>
1	2	3	4	5
<b>1.1 Earthwork</b>	<b>14.08%</b>	<b>1.1.1 Earthwork in embankment/ cutting including compaction up to H*/4 from ground level complete in all respects.</b>	<b>30%</b>	<p>(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.</p> <p>(b) Provided that payment for the blanketing layer shall be made on completion of minor bridges including slab / RCC box(item no 1.4)/pipe culverts (item 1.5) 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 1.4 and pipe culverts shall be payable separately in accordance with item 1.5.</p> <p>*H = Height of formation from ground</p>
		<b>1.1.2 Earthwork in embankment/ cutting including compaction from H/4 to H/2 from ground level complete in all respects.</b>	<b>30%</b>	
		<b>1.1.3 Earthwork in embankment/ cutting including compaction from H/2 to 3H/4 from ground level complete in all respects</b>	<b>20%</b>	
		<b>1.1.4 Earthwork in embankment/ cutting including compaction from 3H/4 level to H from ground level complete in all respects including rolling of side slopes</b>	<b>20%</b>	

				level minus blanketing thickness  Note:- The whole Project length may be divided in sections depending on average Formation Height/depth Upto 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 Ht. and separate EW payment milestone may be made as it is made for item No. 1.1. ( i.e. 1.1A, 1.1 B, 1.1C, 1.1D)
		Total	<b>100%</b>	
<b>1.2</b>	<b>0.12%</b>	1.2.1 Blanketing work complete in all respect	<b>87.48%</b>	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.
		1.2.2 Slope Protection by Turfing of formation Slope	<b>12.52%</b>	
		Total	<b>100%</b>	
<b>1.3. Mega Bridges</b>	<b>19.42%</b>	1.3.1 Super-structure: Completion of the super structure except deck slab and bearings.	<b>86.90%</b>	(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.
		1.3.2 Completion of the deck slab, Inspection side Pathway, bearings/ expansion joints and making bridge ready for track linking including Bearings	<b>11.93%</b>	
		1.3.3 Bridge approaches with required backfilling and filter media with a transition system.	<b>0.35%</b>	

		1.3.4 Miscellaneous works: Completion of the remaining works including hand rails, trolley refuges, walls, all protection works, pitching, boulder backing, railing on inspection platform, river training works, all types of marking on bridges DL HFL gauges, all plaques bridge tablets, tests like load testing of span, etc., complete in all respects and fit for use.	<b>0.83%</b>	<p>(c) Payment shall be made on completion of each component/stage of an Important Bridge as per the weightage given in this schedule.</p> <p>(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 casting of concrete pre-cast elements/Assembled plate girders/Assembled open web girders etc.&amp; transportation to site</p> <p>(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.</p> <p>[ 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</p>
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				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 misc. works shall be determined by dividing total misc. cost of the bridge of all the bridge by number of all the bridges - <b>These instructions are to be deleted after customisation</b> ].
		Total	<b>100%</b>	
<b>1.4 Major Bridges</b>	<b>10.96%</b>	1.4.1 Super-structure: Completion of the super structure except deck slab and bearings	<b>77.80%</b>	<p>a. Cost of each bridge shall be determined on pro rata basis with respect to the total linear length of the Major Bridges.</p> <p>b. 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.</p> <p>c. Payment shall be made on completion of each</p>
		1.4.2 Completion of the deck slab, Inspection Pathway, bearings/ expansion joints and making the bridge ready for track linking including Bearings	<b>10.91%</b>	
		1.4.3 Bridge approaches with required backfilling and filter media with a transition system.	<b>1.32%</b>	

		<p>1.4.4 Miscellaneous works: Completion of the remaining works including hand rails, trolley refuges, walls, all protection works, pitching, boulder backing, railing on inspection platform, river training works, all types of marking on bridges DL HFL gauges, all plaques bridge tablets, tests like load testing of span, etc., complete in all respects and fit for use.</p>	<p><b>9.96%</b></p>	<p>component/stage of an Major Bridge as per the weightage given in this schedule.</p> <p>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.&amp; transportation to site</p> <p>i. The supply of structural steel for fabrication of girders may be paid at the rate of 75% of cost of material on its delivery at a RDSO's approved workshop on submission of BG/insurance surety bond of equivalent amount.</p> <p>ii. If contractor sets up workshop at site, then BG/insurance surety bond shall not be insisted upon.</p> <p>The amount paid against the supply of structural steel shall in any case not exceed 75% of payment admissible under the stage.</p> <p>e. For item no 1.4.1/a and 1.4.1/b if a bridge is constructed with pile/well foundation: 70% payment shall be released upon finishing the</p>
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				<p>piling/well sinking activity.</p> <p>[ For the purpose of calculation of quantity item No. 1.4.1/a and 1.4.1/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. 1.4.2/a and 1.4.2/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 1.4.3 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 1.4.4 and 1.4.5 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 1.4.6 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 - <b>These instructions are to be deleted after customisation</b>].</p>
		Total	<b>100%</b>	
<b>1.5. Minor Bridges</b>	<b>0.72%</b>	1.5.1 Completion of the slab with launching, Inspection Pathway, bearings/ expansion joints and making the bridge ready for track linking including Bearings.	<b>10.00%</b>	(a) Cost of each bridge shall be determined on pro rate basis with respect to the total clear span of the Minor Bridges.

		1.5.2 Miscellaneous works: Completion of the remaining works including hand rails, trolley refuges, walls, all protection works, pitching, boulder backing, railing on inspection platform, river training works, all types of marking on bridges DL HFL gauges, all plaques bridge tablets, tests like load testing of span, etc., complete in all respects and fit for use.	<b>90.00%</b>	<p>(b) Payment shall be made on completion of each component/stage of an 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 &amp; slab for slab bridges shall be determined by dividing total cost of the RCC boxes, Abutments, pier &amp; 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 prorate basis- <b>These instructions are to be deleted after customisation</b>].</p>
		<b>Total</b>	<b>100%</b>	
<b>1.6 Track works</b>	<b>4.68 %</b>	1.6.1 Supply of ballast and staking	<b>23%</b>	<p>(a) Unit of measurement is cum for item No. 1.6.1 cum. [80%] payment may be will be released after taking indemnity bond. The 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.</p>
		1.6.2 Bed Ballast laying, compacting initial layer of 200 mm to facilitate mechanized track laying.	<b>1%</b>	



		1.6.3 Mechanized track laying in block section between station limits on PSC sleepers or on BLT complete in all respects including laying [ 60 Kg] PSC sleepers at sleeper density of [1600/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.		For items from 1.6.2 to 1.6.4. Payment of each stage shall be made on pro rata basis on completion of a stage in a continuous length of minimum 100 m.
		1.6.3/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 ,( including dismantling of MG track etc.)	<b>33%</b>	(c) For item no 1.6.3 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.
		1.6.3/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.	<b>17%</b>	(d) For item no 1.6.4 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.
		1.6.4 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 [1600/km on main line and 1540/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		(e) On supply of complete T/O sleepers sets payments of [15%] of item No. 1.6.4/a and 1.6.4/b will be released on prorate basis after taking indemnity bond.  (f) On supply of T/O switches, Xings and fittings, payments of [35%] of item No. 1.6.4/a and 1.6.4/b will be released on prorate basis after taking indemnity bond.  Note: In case option of item No. 1.6.1 is not operated, then this item will be added in item No. 1.6.2 and 1.6.5

		1.6.4/a Skelton linking without 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.,( including dismantling of MG track & point crossing etc.)	<b>7%</b>	
		1.6.4/b 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.	<b>18%</b>	
		1.6.5Ballast laying to facilitate lifting of track, making of full ballast cushion and profile, distressing of long welded rails, machine tamping of track.	<b>3%</b>	
		<b>Total</b>	<b>100%</b>	
<b>1.7 Tunnels</b>	<b>22.13%</b>	1.7.1 On completion of Tunnel Portals Excavation.	<b>3.64%</b>	(a) On a pro rate basis with respect to the total linear length of all bored tunnels. (b)Payment shall be made on completion of each stage of a tunnel as per the weightage given in this schedule. (c) Permanent support system and Lining work including its cement and reinforcement steel shall be paid separately under schedule G1.
		1.7.2 On completion of tunnelling including all activities of drilling, blasting etc. complete in tunnel, niches and refuges	<b>95.96%</b>	
		1.7.3 Environment Management Plan	<b>0.40%</b>	
		<b>Total</b>	<b>100%</b>	

<b>1.8 Ballastless Track (BLT)</b>	<b>8.20%</b>	1.8.1 Design and construction of BLT including transition portion as per specifications complete in all respect including trackwork on secondary rails/new rails.	<b>98.48%</b>	The unit of measurement is linear length. Payment shall be made on a pro rata basis on completion of continuous length of minimum 50 m.
		1.8.2 Supply of 5% extra fittings for maintenance.	<b>1.52%</b>	
		Total	<b>100%</b>	
<b>1.9 Other Engineering works</b>	<b>12.41%</b>	1.9.1(a) Construction of platforms including platform fencing and Wall but excluding items mentioned in item no 1.9.1(b) and (c) as per yard diagram.	<b>34.74%</b>	For 1.9.1(a), (b), (c) unit of measurement is square metres, Payment shall be made on pro rata basis on completion of each platform.
		1.9.1(b) Surfacing of platform with [Kota stone/ CC] including passenger amenities.	<b>12.73%</b>	1.9.2 Unit of measurement is number. Payment of each level crossing shall be made on completion on prorata basis with respect to total number of level crossings
		1.9.1(c) Provision of platforms including shelters	<b>3.86%</b>	
		1.9.2 Railway level crossings and gate lodges including water supply, sewer line, approach road, fencing and electrification.	<b>0.00%</b>	1.9.3 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 total length of all foot over bridges.
		1.9.3 Foot over bridges on railway stations and pedestrian foot over bridges at other locations	<b>3.95%</b>	
		1.12.4 Construction of railway station buildings and service buildings, cable huts, tool rooms, SSP complete in all respects including fixing doors, windows, sanitary, water supply works, electrification, lifts, escalators and all other specified and incidental works	<b>7.35%</b>	1.9.4 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.

	1.9.5 Construction of staff quarters complete in all respects including fixing doors, windows, sanitary, water supply works, electrification, lifts, escalators and all other specified and incidental works	<b>2.68%</b>	<ul style="list-style-type: none"> <li>• 50% Payment shall be paid after completion of structural works i.e. beam, columns &amp; slab in case of framed structure or walls &amp; slabs in case of other buildings and</li> <li>• 30% Payment shall be paid after completion of finishing and</li> <li>• 20% Final completion of works in all respects ready for use.</li> </ul> <p>1.9.5 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.</p> <p>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 &amp; slab in case of framed structure or walls &amp; slabs in case of other buildings and 50% Final completion of works in all respects ready for use.</p> <p>1.9.6 Payment shall be made on pro rata basis on completion of these works for the area and buildings covered as completed</p>
	1.9.6 On completion of circulation area, parking area, boundary wall, internal roads, drainage, water supply works including bore well, pump house, water tanks, power supply, lighting, landscaping and all other incidental works in railway station/colony area.	<b>9.81%</b>	
	1.9.7 Boundary walls, boundary pillars, fencing, roads, footpaths in block sections		
	1.9.7.1 Boundary pillars	<b>0.10%</b>	
	1.9.8 Signage, information boards and posts	<b>0.20%</b>	
	1.9.9 Drainage along the railway line	<b>20.01%</b>	
	1.9.10 Cable Duct along the Railway Track	<b>4.57%</b>	

				<p>works for stage payment under Items 1.9.4 and 1.9.5.</p> <p>1.9.7 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>1.9.8 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>1.9.9 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>1.9.10 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>
		Total	<b>100%</b>	
<b>1.10 Inventory for civil &amp; track works</b>	<b>0.13%</b>	<b>1.10</b> Supply of material as per the inventory	<b>100%</b>	On completion of supply of full inventory at least three months before the issue of the Provisional Certificate.

<b>1.11 Integrated testing and commissioning.</b>	<b>2.84%</b>	<b>1.11</b> Successful completion of Integrated testing and commissioning.	<b>100%</b>	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.
<b>Total</b>	<b>95.69%</b>			

Note – %age Stages for payment given above may be further bifurcated with the approval of Authority

2.0 Railway Electrification Works				
Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage	Payment Procedure
1	3	4	5	6
2.1 Overhead Equipment (OHE) Work	2.38%	2.1.1 Completion of Design & drawing and Foundation work for block sections including stations and yards	10.50%	Payment for each stage shall be made for a Section and its yards, measured in track kilo metre (TKM) pro rata with reference to the total TKM.
		2.1.2 Supply of steel (All steel item including Masts, Portals and their components)	22.00%	
		2.1.3 Completion of Steel erection (Mast & Portal) & grouting with stencilling works.	7.00%	
		2.1.4 Completion of erection of Bracket, Guy Rod, mast fittings (Complete pre wiring activity), Height gauge & protection screen	10.50%	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 competent authority for the purpose of payment
		2.1.5 Supply of Contact & Catenary wire only	28.00%	
		2.1.6 Completion of wiring along with erection of balance weight, droppering & clipping, catenary - anticreep wire including antitheft charging with completion of OHE bonding & earthing work.	16.00%	
		2.1.7 EIG Sanction & Commissioning including modification of SCADA, provision of T&P items, stations SWR boards and attending	6.00%	
				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 payment admissible under

		of all the defects / deficiencies. 2.1.8		<p>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.</p> <p>For item No. 1.7 Stage payment will be released on completion of work under Item no [2.2, 3.2]</p>
		<b>Total</b>	<b>100%</b>	
<b>2.2 Switching Posts</b>	0.18%	<p>2.2.1 Design, Drawing and completion of SP, SSP Civil works i.e. Fencing foundations, Structure foundations, Equipment foundations etc. complete.</p> <p>2.2.2 Supply and Erection of Steel structures complete for all Equipment's, earthing stations, Earth mat including buried rail, Gantry along with feeder arrangement, opposite gantry and earthing system.</p> <p>2.2.3 Supply and Erection of all Equipments including Electrical switchgears (BM) &amp; PT, LA, DPI, SPI, SPS, Busbar, ATs, etc.</p>	<p><b>10.00%</b></p> <p><b>20.00%</b></p> <p><b>25.00%</b></p>	<p><b>The stage 2.2 excludes the work &amp; payment of SSP's cubicle building of switching Post, and will be covered in civil scope work and corresponding stage of schedule -G.</b></p>



		<p>2.2.4 Supply &amp; Erection of bus bars, cable trench, Completion of spreading of ballast, Control cables, SCADA equipment (RTU) at SP SSP and software upgradation/ mapping at RCC</p> <p>2.2.5 EIG Certification, Testing, Commissioning and charging at 25 KV. Supply, erection testing and commissioning of Battery &amp; battery charger, Completion of Testing, commissioning, EIG certification and Charging of SP SSP including all miscellaneous items, etc. including yard illumination/lighting, Electrification of SP/SSP building, providing all types of Boards, painting, numbering, finishing, cross feeders &amp; drop jumpers to OHE, attending all the defects / deficiencies and other miscellaneous works.</p>	<p><b>35.00%</b></p> <p><b>10.00%</b></p>	
		Total	<b>100%</b>	
2.3 Auxiliary Transformer Stations	0.01%	<p>2.3.1 Completion of all works pertaining to auxiliary transformer, CLS panel , erection of cable, LV box, Anticlimbing device, DO assembly, 9tonne arching horn assembly including testing of all the equipment.</p> <p>2.3.2 Charging and Commissioning, attending all the defects / deficiencies.</p>	<p><b>90.00%</b></p> <p><b>10.00%</b></p>	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.
		Total	<b>100%</b>	

<b>2.4 Various electrical general services work including tunnel electrification work.</b>	1.62%	2.4.1 Completion & Approval of all type of Design & Drawings, and Completion of all type of Wiring works	<b>25.00%</b>	Payment shall be made after the completion and commissioning of works under this item of work.
		2.4.2 Supply, Erection and Completion of All type of Luminaries /Lighting works (including Service buildings, PF area and Street lights)	<b>30.00%</b>	
		2.4.3 Supply, Erection and commissioning of Air Conditioners, All types of Fans (Ceiling, Exhaust, etc.), Station Name board, Signages, etc.	<b>35.00%</b>	
		2.4.4 Commissioning of Station with complete Electrical General services work including attending of all defects / deficiencies.	<b>10.00%</b>	
<b>2.5 Extension/ Augmentation of general power supply</b>	0.12%	2.5.1 Completion including commissioning of extension / augmentation of general power supply for station / building / platforms and other service buildings.	<b>60.00%</b>	Payment shall be made after the completion and commissioning of works under this item of work.
		2.5.2 Completion including commissioning of extension / augmentation of general power supply for Tunnel electrification work.	<b>40.00%</b>	
	<b>4.31%</b>	<b>TOTAL</b>	<b>100%</b>	
<b>Note-</b> %age Stages for payment given above may be further bifurcated with the approval of Authority.				

### **SCHEDULE - G**

*(See Clauses 10.1.4 and 17.3)*

**Note** - For inter se ranking of offers considering capitalization of Transformer losses : **(NOT APPLICABLE FOR THIS WORK)**

- i. 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. TIISPC/PSI/TRNPWW4200 (for V connected transformer), TIISPC/PSVTRNPWR/5200 (for Scott connected transformer) and Specification No. TVSPC/PSVAUTOTR/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. Firms should indicate the value of parameters Maximum No- Load Loss in watt (l) 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/PSVTRNPWR/4200 for V connected power transformer, RDSO .TVSPC/PSVTRNPWR/5200 (for Scott connected transformer) and RDSO Specification No. TVSPC/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 as **per NIT**
2. Schedule G1 consists of seven parts as under of which any or all schedules may be used as per the requirement.
3. Rate should be quoted (% above/Below/at par) on IREPS portal. In case the bidder quote rates anywhere other than IREPS portal, the offer will summarily be rejected.
4. **Schedule G1**

Schedule	Description	Item	Value of Item/ Schedule	Payment Procedure	Applicable rates	PVC applicable
G1A	A-Civil Building Works	CPWD DSR 2023 Items	As per NIT	Payment shall be made on actual work done as per work done measured while submitting stage payment certificate	As detailed in Para-3 above	PVC Applicable as per clause 17.8.4-B of Article 17 of this tender document
	B-Earthwork in Cutting for CWD USSOR 2021 Items	USSOR 2021 Items				
	C-Bridge Work Sub Structure "Foundation"	USSOR 2021 Items				
	D-Supplying and using Cement.	USSOR 2021 Items.				
	E-Supplying and using Reinforcement steel"	USSOR 2021 Items				
	F-Bridge Work Sub Structure Miscellaneous	USSOR 2021 Items.				
	G-Bridge Work Sub Structure and Pway	NS ITEMS				

	H-Tunnel Underground Support System	NS ITEMS				
	I-Tunnel Supply and Utilizing Steel Fibers	NS ITEMS				
	J-Tunnel Underground Concrete works	NS ITEMS				
	K-Tunnel Supply and Utilizing PU Grout	NS ITEMS				
	L-Tunnel Underground Drainage Works	NS ITEMS				
	M-Horticulture	CPWD DSR 2020 Items				
G1B	Modification of LT/11KV/33KV HT track crossings in the section into Underground crossings	NS items				

**Note: 1)** Before the start of any sub-work(s) under Schedule G-1, Drawing, Method Statement, BOQ etc. shall be finalised and approved by the 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 etc.
- (j) Details of Track Structure & its components.
- (k) Details of existing utilities in Row and plan for their shifting.

**2. ~~Signal Engineering:~~**

- (a) ~~Signal interlocking plan (station/auto huts/gate huts)~~
- (b) ~~Route Control table (station/auto huts/gate huts)~~
- (c) ~~Panel/ VDU diagram (station/ gate huts)~~
- (d) ~~Cable Core Chart.~~
- (e) ~~Cable Route Plan (Separate for station & blocks sections)~~
- (f) ~~Power Supply Diagram (station/auto huts/ control)~~
- (g) ~~Equipment sizing (station/ auto huts/gate huts/control)~~
- (h) ~~Equipment lay out and details including cable troughs required (station/ auto huts/gate huts/control)~~
- (i) ~~Track circuit diagram (station/ auto huts/gate huts/control)~~
- (j) ~~Bonding plan (station/ auto huts/gate huts/control)~~



- (k) ~~Circuit Diagrams.~~
- (l) ~~Station/Gate working Rule/Rule diagrams~~
- (m) ~~Equipment Rack details~~
- (n) ~~Cable Termination Rack Diagram~~
- (o) ~~Fuse Details~~
- (p) ~~Location/junction boxes lay out & wiring details~~
- (q) ~~Lightening, surge protection & earthing plan.~~

### 3. ~~Telecommunication Engineering:~~

- (a) ~~Location and connectivity of all equipments 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) ~~Channelling plan.~~

### 4. Electrical Engineering (Traction):

- (a) General arrangement of the Traction substation for (1 x 25 KV) system single transformer and the double transformer with incoming as 220 KV or 132 KV 3 phase. (These substations will be remotely controlled and operated) – **Not Applicable**
- (b) General arrangement of SP (Sectioning Post). (These substations will be remotely controlled and operated)
- (c) General arrangement of the SSP (Sub sectioning post). (These substations will be remotely controlled and operated)
- (d) Power supply arrangement for 25 KV traction system and Sectioning drawing for the traction arrangement.
- (e) Power supply arrangement for the signals at the stations (Auxiliary transformer and the arrangement of 230-volt supply)
- (f) Typical layout of the control room at the traction substation SP, SSP.
- (g) Typical layout of the remote-control centre.
- (h) General arrangement of the implementation of the SCADA system.
- (i) Earthing arrangement at the TSS, SP and SSP.
- (j) Preparation of Location plans for TSS/SP/SSPs

- (k) Typical arrangement of the regulated OHE for (2 X 25 KV) system with the feeder arrangement. - **Not Applicable**
- (l) Power supply arrangement with IR at interface point.
- (m) Latest Employment schedule
- (n) OHE Layout Plan (LOP)
- (o) CSD
- (p) SED
- (q) Bridge Mast Drawings with Calculation as per BS-121
- (r) As Erected Drawings
- (s) Wiring Diagram
- (t) Bonding plans
- (u) Station Working Rule Diagrams (Including Literature/Appendix-G in standard divisional format)
- (v) Other diagrams/ designs as required for erection of the OHE/TSS
- (w) Diagrams/designs as listed in ACTM.
- (x) EIG Sanction Documents.
- (y) CRS/PCEE Opening documents as per attached list & proformas.

## **5. Electrical Engineering (General Power supply)**

- (a) General Arrangement drawings of LT/11/33 KV Track Crossings
- (b) Wiring diagrams for each Station and Service buildings.
- (z) General arrangement of the 11/33/66 KV substations for the station and the service buildings.- **Not Applicable**
- (c) General arrangement of the distribution of the 415 V 50 Hz supply to various loads.

### **Note:**

1. The above Electrical drawings list is for reference and is not exhaustive and scope of contractor will not be limited to this list. Any other drawings/design essential for the execution of the work will be in the scope of this tender.
2. Design and Drawings shall be developed in conformity with the Specifications and Standards set forth in Schedule-D and Clause 10.2 of ARTICLE-10.
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) MEGA 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

#### 1 Project Completion Schedule

During the 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.

#### 2 Project Milestone-I

- 2.1 Project Milestone-I shall occur on the date falling on the **9th (ninth) Month** 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 5% (ten per cent) of the Contract Price.

#### 3 Project Milestone-II

- 3.1 Project Milestone-II shall occur on the date falling on the **18th (Eighteen) Month** 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 40% (forty per cent) of the Contract Price.

#### 4 Project Milestone-III

- 4.1 Project Milestone-III shall occur on the date falling on the **30th (Thirtieth) Month** 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 70% (Seventy per cent) of the Contract Price.

#### 5 Scheduled Completion Date

- 5.1 The Scheduled Completion Date shall be the last day of **42nd (Forty Second) month** from the Appointed Date.
- 5.2 On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

- A. 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.

## 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 a physical milestone shall become due upon non completion of each deadline as mentioned in table below.

However, in case where a 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	Damages per day after the deadline
1	MI-1	Deployment of 'Contractor's Authorized Representative (Project Director	D+20	Rs. 10,000/ day (Subject to maximum of Rs. 3,00,000/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 Prima vera (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	Rs 10,000/day
		Method Statements Key items	D+30	Rs 10,000/day per statement
		Monthly cash flow forecast for the Project	D+30	Rs. 15,000/ day.
		Resource deployment Plan (Men & Machinery)	D+30	Rs. 10,000/ day

		Procurement Plan in conformity with project implementation schedule (Civil, Electrical, S&T)	D+30	Rs. 10,000/ day
3	MI-3	Proposal to engage Design consultants with three alternatives of qualified, reputed and experienced Design firms	D+30	Rs. 25,000/day

**B. Project Initiation Stage**

S.no	Milestone No	Milestone Description	Deadline Appointed Date (D)+ Days	Damages after the Deadline
1	MP-1	Setting up Project office, Site Laboratory Project Office	D+30, Site Lab - D+45	Rs.10,000/day
2	MP-2	Submission of Utility Survey & Shifting Plan	D+45 days	Rs.15,000/day
3	MP-3	Submission of Ground levels, cross sections, validation report of tender data including alignment and L-section confirmation/modification	D+60 days	Rs.15,000/day
4	MP-4	Submission of drawings (including DBR/DBN) GADS for each type of bridges	D+75 days	Rs.10,000/day
5	MP-5	Submission of conceptual plan for 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 – 50% Block sections. Test report should include factual GT report, interpretations and recommendations (compliance to latest IS Code)	D+75 days	Rs.15,000/day
7	MP-7	Submission of detailed sample design for each type of bridges	D+90 days	Rs.10,000/day
8	MP-8	Submission of Route Control Charts & signaling interlocking plan	NA	NA
9	MP-9	Submission of Formation Design including Slope protection	D+120 days	Rs.10,000/day

10	MP-10	Submission of Procurement Plan & delivery Schedule	D+120 days	Rs.10,000/day
11	MP-11	Submission of detailed Design for Station Buildings and allied buildings/structures	D+120 days	Rs.10,000/day
12	MP-12	Submission of Schematic Drawings – Signal Engineering	NA	NA
13	MP-13	Submission of Schematic Drawings – Telecommunication Engineering	NA	NA
14	MP-14	Submission of Schematic Drawings – Electrical (Traction)	D+120 days	Rs.10,000/day
15	MP-15	Submission of Schematic Drawings – Electrical (General Power Supply) drawings	D+120 days	Rs.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, Interpretations	D+120 days	Rs.10,000/day
17	MP-17	Submission of Formation Design including Slope protection	D+120 days	Rs.10,000/day
18	MP-18	Submission of Detailed Design for all type of bridges in entire Block section	D+180 days	Rs.10,000/day
19	MP-19	Submission of Detailed Design of protection/ miscellaneous works	D+270 days	Rs.10,000/day

**C. Project Construction Stage**

S.no	Milestone No	Milestone Description	Deadline for Achievement in Days	Damages after Deadline
1	MCn-1	Making arrangement of Power, Water 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 functional Station & Yards (if any) of 50% project	FMI-1	Rs.5,000/day

		length		
5	MCn-5	Foundation of bridges (important Major/Minor ROB/RUB, bridges)	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 bridges – 100% of each Bridge	FMI-2	Rs.5,000/day
8	MCn-8	S&T Cable trenching 100% 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
10	MCn-10	Site clearance and preparation of Formation, including all functional Stations & Yards (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 Sections	FMI-2 + 1/2 of (FMI-3 - FMI-2)	Rs.5,000/day
12	MCn-12	Station & Allied Buildings – Superstructure	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 – Finishing	FMI-2 + 1/2 of (FMI-3 - FMI-2)	Rs.5,000/day
16	MCn-16	Bridges – 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 Buildings – Systems & Equipment	FMI-3	Rs.5,000/day
20	MCn-20	Track Linking – 100%	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 + 30 days	Rs.5,000/day

**FM I, II, III, IV refers to financial milestones as per para 2,3,4,5 of this Sch I**

**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 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 Test**

- 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 Testing**

- a) The Contractor shall submit the Project Quality Assurance Plan and its subplan as described in EPC Agreement. According to the plans, the Contractor shall implement tests which are listed, but not limited to, in the EPC Agreement.
- b) The Contractor shall be responsible for all on-site and off-site testing and for all in-situ testing. All appropriate laboratory tests may be carried out in the Contractor's laboratory, or tests shall be carried out in other laboratories if consented by the Authority's Engineer provided that: the identified laboratory is accredited by NABL for the relevant work; and particulars of the proposed laboratory are submitted to the Authority's Engineer for his consent.
- c) All site specific and in-situ tests shall be done in the presence of the Authority's Engineer. The Authority may also be present if he so desires.
- d) Equipment, apparatus and materials for all on site, off site and in-situ tests including laboratory compliance tests to be carried out (by the Contractor and / or by the Authority's Engineer] shall be provided by the Contractor. The equipment and apparatus shall be maintained by the Contractor and shall be calibrated before the testing starts, at regular intervals as specified and as directed by the Authority's Engineer. The equipment, apparatus and materials for in-the situ tests shall be removed by the Contractor as soon as practicable after the testing is complete
- e) The Contractor shall be entitled in all cases to attend the testing carried out in the Authority's or other laboratories, to inspect the calibration certificates of the testing machines and to undertake the testing on counterpart samples. Testing of such samples shall be undertaken in laboratories complying with the provisions which are submitted

to the Authority's Engineer for consent prior to the testing

- f) Attendance on tests, including that by the Authority's Engineer, the Contractor and the designer shall be as laid down in the Quality Assurance Procedures .

## **2.2 Batches, Samples and Specimens**

- a) A batch of material is a specified quantity of the material that satisfies the specified conditions. If one of the specified conditions is that the material is to be delivered to the Site at the same time , then the material delivered to the Site over a period as consented by the Authority's Engineer shall be considered as part of the same batch if in the opinion of the Authority's Engineer there is sufficient proof that the other specified conditions applying to the batch apply to all of the material delivered over this period.
- b) A sample is a specified quantity of material that is taken from a batch for testing and which consists of a specified amount, or a specified number of pieces or units, of the material. A specimen is the portion of a sample that is to be tested.

## **2.3 Samples for testing**

- a) Samples shall be of sufficient size and in accordance with relevant standards to carry out all specified tests.
- b) Samples taken on the Site shall be selected by, and taken in the presence of the Authority's Engineer and shall be suitably marked for their identification. An identification marking system shall be evolved at the start of works in consultation with the Authority's Engineer.
- c) Samples shall be protected, handled and stored in such a manner that they are not damaged or contaminated and such that the properties of the sample do not change.
- d) Samples shall be delivered by the Contractor, under the supervision of the Authority's Engineer, to the specified place of testing. Samples on which non-destructive tests have been carried out shall be collected from the place of testing after testing and delivered to the Site or other locations by the Contractor and as instructed by the Authority's Engineer.
- e) Samples that have been tested may be incorporated in the Permanent Works provided that: (a) the sample complies with the specified requirement (b) the sample is not damaged; and (c) the sample is not required to be retained under any other provision of the Contract. (d) consent of the Authority's Engineer is obtained
- f) Additional samples shall be provided for testing if in the opinion of the Authority's Engineer: (a) material previously tested no longer complies with the specified requirements; or (b) material has been handled or stored in such a manner that it does not comply with the specified requirements

## **2.4 Compliance of Batch**

- a) The results of tests on samples or specimens shall be considered to represent the whole batch from which the sample was taken.
- b) A batch shall be considered as complying with the specified requirements for a material if the results of specific tests for the specified properties comply with the specified requirements for the properties.

- c) If additional tests are permitted or required by the Authority's Engineer but separate compliance criteria for the additional tests are not stated in
- d) the Contract, the compliance criteria for the same shall be mutually decided by the Authority's Engineer and the Contractor.
- e) Cost of all such tests shall be borne by the Contractor

## **2.5 Records of Tests**

- a) Records of in-situ tests and laboratory compliance tests carried out by the Contractor shall be kept by the Contractor on the Site and a report shall be submitted to the Authority's Engineer within seven (7) days, or such other time stated in the Contract or in the Quality Assurance Programme, (a) after completion of each test. In addition to any other requirements, the report shall contain the following details: material or part of Works tested; (b) location of the batch from which the samples were taken or location of the part of the Works; (c) place of testing; (d) date and time of tests; (e) weather conditions in the case of in-situ tests; (f) technical personal supervising or carrying out tests. (g) size and description of samples and specimens; (h) method of sampling (i) properties tested; (j) method of testing; (k) readings and measurements taken during the tests. (l) test results, including any calculations and graphs; (m) specified acceptance criteria; and (n) other details stated in the Contract and / or as required by the Authority's Engineer
- b) Reports of tests shall be signed by the Contractor's site representative, or by any other representative authorized by the Contractor.
- c) If requested, records of tests carried out by the Authority's staff or by the Authority's Engineer shall be given to the Contractor.

## **2.6 Production Tests (At Works)**

- a) Should the Contractor propose or the Contract includes use of any equipment not previously proven in service , the Contractor shall undertake a thorough testing of pre-production units to the entire satisfaction of the Authority's Engineer. The Contractor shall identify such equipment which differs significantly from that which is already in service elsewhere.
- b) All materials, components, sub-assemblies, unit assemblies including software, cables, wiring etc. shall be subject to testing and certification. Notification of these tests shall be submitted to the Authority's Engineer twenty eight (28) days in advance of carrying out tests. The Authority's Engineer shall then determine which items, if any shall be accepted based on previous supply or experience.
- c) Where processor based equipment is to be used for the Works, test shall include also verification of software used in this application
- d) Works Tests shall include but not limited to
  - Physical Inspection
  - Dimensional check
  - Electrical check
  - Calibration

- Output check
  - Operational performance
  - Full load test
  - Flash over test
  - Insulation test
  - Soak test
  - Non-destructive test to assess integrity or strength of parts
  - Tests on bearings as specified in specifications.
  - Tests on production of rails as prescribed in IRS T-12- 2009
- 2.7 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 Load test on MEGA and MAJOR Bridges and any other test on bridges, tunnels and earthwork, as per requirement of CRS. NDT(non destructive testing) and concrete core testing to be done as per instructions of A.E. and railway guidelines. All other tests as per approved QAP to be done.
- 2.8 Integrated Testing of the 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
- 2.9 Sanction of Commissioner of Railway Safety (CRS) is required before opening of track in terms of Chapter XIII of Indian Railway Permanent Way Manual.
- 2.10 [Riding quality of track and recording of various track parameters on electronic track recording cars 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. TQI values to be as per IRPWM.
- 2.11 Tests for bridges: All Mega, major, Viaduct and minor bridges shall be subjected to the tests as prescribed in Specifications and Standards in Schedule D.
- 2.12 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.
- 2.13 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.

- 2.14 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.
- 2.15 The USFD (Ultra Sonic Flaw Detection) testing shall be carried out by the Authority for the track & welds, the defective weld shall be replaced as per the Manual and extend guidelines.
- 2.16 Following the satisfactory completion of the acceptance tests and the Integrated System Test the Engineer will commence an extended period of trial running to prove all technical systems, to the satisfaction of the CRS or any other authorized official, who will check the system from safety point of view and to allow all technical systems to settle and to train staff in working procedures. For the purpose of assessing the riding quality of track an OMS (Oscillating Monitoring System) accelerometer run at a speed as deemed fit by Authority Engineer shall be arranged by the Authority. The said run will be conducted keeping the accelerometer in a passenger fit coach attached as the last vehicle of the train formation. All the arrangements including men and material required for conducting such a run will be made by the Authority. The acceptance criteria for the track in respect to peaks shall be as per Manual and latest guidelines. In case the track fails to qualify within the aforesaid criteria, the track will be attended to rectify the defects and a rerun of the recording car shall be scheduled.

### **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.

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## 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 (km ....to km ...) in 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 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:

(Signature)

SIGNED,SEALED AND  
DELIVERED

For and on behalf of

AUTHORITY ENGINEER

(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 the .....section (km ..... to km ..... ) of .....in 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 the 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 The 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 MEGA 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 checks prescribed in this agreement for each category or type of test for quality control by the Contractor. Procedure order for Measurement, Test Check Limit, Material Passing and Payments etc. shall be in accordance to Railway Board letter no. 2016/CE-I/CT/14/Measurement dated 02.08.2024.
- 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 Engineers 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 measures, 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.

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## 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. 1,25,00,000

- 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.

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**SCHEDULE - O**

*(See Clauses 4.6 & 4.7)*

**Provision of Traffic Blocks and Power Blocks**

1. Provision of Traffic Blocks Power Blocks and Disconnections

Deleted, NA

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## 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:

#### 1. For Track Machines:

SN	Particulars of each type of machinery and equipment	Unit rate in rupees in rounded figures.
1	3X / CSM / DUO	89,951/- per kms
2	BRM	23,612/- per kms
3	DGS	59,292/- per kms
4	UNIMAT	41,864/- per T/out

**The cost of Fuel/consumables for operating Track machine is to be borne by contractor.**

#### 2. For Electrical Machinery & Equipment:

S.N.	Particulars of each type of machinery and equipment	Daily rate in rupees in rounded figures.
1	8 wheeler Tower Wagon	2,000/-
2	Diesel Loco	2,000/-
3	BRN wagon	1,000/-
4	Conventional non-ac coach	1,000/-
5	BRN mounted 5 MT Rail Crane	1,000/-

Note: For Machines and T&P whose hire charges are 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.

**The End of Schedules.**

**Appendices**

## APPENDIX-I

### LIST OF BID-SPECIFIC CLAUSES<sup>s</sup>

#### **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 (I) : 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)

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<sup>s</sup> 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/EPC 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 CLAUSES<sup>24</sup>

#### **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 (footnoteno.19)

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<sup>24</sup>This 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/EPC 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
37. Schedule - P : Machinery and Equipment