

दी ब्रेथवेट बर्न एंड जेसप कंस्ट्रक्शन कंपनी लिमिटेड
The Braithwaite Burn And Jessop Construction Company Limited
(भारत सरकार का एक उद्यम) / (A Government of India Enterprise)

NIT No. eNIT/ROB/JHANSI-2/T-15-2024

Date: December 12, 2024

Registered Office: 27, Rajendra Nath Mukherjee Road,
Kolkata – 700 001, West Bengal.
Phone: (033) 2248 5841-44 Fax: 033-2210 3961
Email: info.bbjconst@bbjconst.com; Website: www.bbjconst.com;

e-Tender No.	eNIT/ROB/JHANSI-2/T-15-2024	Date:	12-Dec-2024
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NOTICE INVITING e-TENDER.

Sealed Tenders under a **two-bid system** (i.e., "Techno-Commercial & Price Part") are invited from eligible bidders for carrying out construction of Road Over Bridge (ROB) and other miscellaneous works as detailed in "**Scope of Work**" / "**BOQ**", here under:

1	NAME OF WORK	CONSTRUCTION OF ROAD OVER BRIDGE IN LIEU OF LEVEL CROSSING NO. 476 IN BANDA-MANIKPUR SECTION.
2	SCOPE OF WORK	AS PER NIT/ BOQ
3	COST PUT TO TENDER/ BASIC COST	RS. 34,39,21,087.00 including GST.
4	COMPLETION PERIOD	15 (FIFTEEN) MONTHS FOR ENTIRE WORK FROM THE DATE OF LETTER OF ACCEPTANCE (LOA) OR WORK ORDER, WHICHEVER IS EARLIER.
5	COST OF TENDER DOCUMENT (NON-REFUNDABLE)	RS.10,000/- (RUPEES TEN THOUSAND ONLY) BY NEFT/ RTGS/ DEMAND DRAFT/ PAY ORDER/ BANKER'S CHEQUE IN FAVOUR OF "THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED" PAYABLE AT "KOLKATA". TENDER DOCUMENTS WITHOUT THE TENDER FEE SHALL BE REJECTED. EXEMPTION FOR MICRO AND SMALL ENTERPRISES (MSE) FOR SUBMISSION OF "TENDER FEE" IS " NOT APPLICABLE " SINCE WORKS CONTRACT ARE EXCLUDED FROM THE PURVIEW OF PUBLIC PROCUREMENT POLICY FOR MSE ORDER, 2012 AND ITS LATEST AMENDMENT(S).
6	EARNEST MONEY	RS.20,00,000/- (RUPEES TWENTY LAKH ONLY) BY NEFT/ RTGS/ DEMAND DRAFT/ PAY ORDER/ BANKER'S CHEQUE IN FAVOUR OF "THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED" PAYABLE AT "KOLKATA". TENDER DOCUMENTS WITHOUT EMD SHALL STRAIGHTWAY BE REJECTED. FOR UNSUCCESSFUL BIDDERS, EMD WILL BE REFUNDED AFTER THE FINALIZATION OF THE ORDER, WITHOUT ANY INTEREST. FOR SUCCESSFUL BIDDER, THE ABOVE EMD AMOUNT WILL BE CONVERTED INTO A SECURITY DEPOSIT AND WILL BE

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		RETAINED BY BBJ TILL SUCCESSFUL COMPLETION OF THE DEFECT LIABILITY PERIOD. EXEMPTION FOR MICRO AND SMALL ENTERPRISES (MSE) FOR SUBMISSION OF "EARNEST MONEY" IS " NOT APPLICABLE " SINCE WORKS CONTRACT ARE EXCLUDED FROM THE PURVIEW OF PUBLIC PROCUREMENT POLICY FOR MSE ORDER, 2012 AND ITS LATEST AMENDMENT(S).												
07	MODE OF SUBMISSION	ONLINE THROUGH THE E-PROCUREMENT SYSTEM OF CPPP (CENTRAL PUBLIC PROCUREMENT PORTAL). A HARD COPY OF THE BID, AS UPLOADED, (TECHNO-COMMERCIAL) SHALL HAVE TO BE SUBMITTED TO BBJ'S REGISTERED OFFICE WITHIN FIVE (05) DAYS OF BID SUBMISSION LAST DATE. TO BBJ'S OFFICE BEFORE OPENING OF TECHNICAL BID. CORRIGENDUM, IF ANY, WILL BE PUBLISHED ON CPPP AND BBJ'S WEBSITE.												
08	DATE & TIME SCHEDULE:	<table border="1"><tr><td>Date of Publishing NIT & Tender Documents</td><td>12/12/2024</td></tr><tr><td>Document download Start Date</td><td>12/12/2024 - 10:00 HRS</td></tr><tr><td>Start Date of uploading of bid document</td><td>26/12/2024 - 10:00 HRS</td></tr><tr><td>End Date for uploading of bid document</td><td>01/01/2025 - 15:00 HRS</td></tr><tr><td>Date of opening of Technical Bid</td><td>02/01/2025 - 15:00 HRS</td></tr><tr><td>Date of opening of Financial Bid</td><td>To be notified later</td></tr></table>	Date of Publishing NIT & Tender Documents	12/12/2024	Document download Start Date	12/12/2024 - 10:00 HRS	Start Date of uploading of bid document	26/12/2024 - 10:00 HRS	End Date for uploading of bid document	01/01/2025 - 15:00 HRS	Date of opening of Technical Bid	02/01/2025 - 15:00 HRS	Date of opening of Financial Bid	To be notified later
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(पार्थ नंदी / PARTHA NANDY)
मुख्य प्रबंधक (परियोजना) / CHIEF MANAGER (PROJECT)

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INSTRUCTION TO BIDDERS

1. **REGISTRATION OF CONTRACTOR**

Any bidder willing to take part in the process of e-Tendering will have to be enrolled & registered with the Government e-Procurement system, through logging on to <https://eprocure.gov.in/eprocure/app>.

2. **DIGITAL SIGNATURE CERTIFICATE (DSC)**

Each bidder is required to obtain a Class-II or Class-III Digital Signature Certificate (DSC) for submission of tenders, from the approved service provider of the National Informatics Centre (NIC) on payment of the requisite amount. Details are available at the web Site (<https://eprocure.gov.in/eprocure/app>) in Clause 2 of Guideline to the bidder. DSC is given as a USB e-Token.

3. **SUBMISSION OF TENDER: ONLINE MODE IN CPPP'S PORTAL**

Bids are to be submitted online through the e-Procurement system of **Central Public Procurement Portal (CPPP)** (<https://eprocure.gov.in/eprocure/app>). Tender along with all other required documents are to be signed and sealed by the authorised signatory while submitting the bid through CPPP. While submitting Price Bid on CPPP, the rates should be properly filled it in the appropriate space in the BILL OF QUANTITY (BoQ) of the Tender.

Hardcopies of the uploaded documents, excluding Price Bid, are to be submitted along with EMD and Tender Fee (as applicable) in a sealed envelope to the BBJ's Registered Office within five (05) days of bid submission last date.

4. **LANGUAGE**

Bids and all accompanying documents shall be in English. In case any accompanying documents are in another language, they shall be accompanied by an English version, which shall prevail in the matter of interpretation.

5. (a) **Cost of Tender (Non-Refundable) of Rs.10,000/-** (Rupees ten thousand five hundred only) in the form of NEFT/ RTGS/ Demand Draft/ Pay Order from any Nationalised or schedule Bank drawn in favour of "The Braithwaite Burn and Jessop Construction Company Limited" payable at "Kolkata". Cost of tender is not refundable.

(b) **Earnest Money Deposit (EMD) of Rs.20,00,000/-** (Rupees twenty lakh only) in the form of NEFT/ RTGS/ Demand Draft/ Pay Order from any Nationalised or Schedule Bank drew in favour of "The Braithwaite Burn and Jessop Construction Company Limited" payable at "Kolkata". In the case of successful bidder, EMD shall be converted to part of Security Deposit and will be retained by BBJ till the completion of the entire job. EMD shall not carry any interest.

(c) **Bank Details for NEFT/ RTGS:**

Name of Beneficiary: THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED.
Bank Name: STATE BANK OF INDIA
Branch: DALHOUSIE SQUARE (CALCUTTA)
Bank Address: 2, B.B.D. BAGH (EAST), KOLKATA – 700001 (W.B.).
Bank Account No.: 11175160292
Bank Account Type: Current
IFS Code: SBIN0001401

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PS: In the case of EMD & Tender Fee submitted through NEFT/ RTGS, necessary documents need to be uploaded in CPP Portal and submitted along with the bid.

6. **SUBMISSION OF BID:** The Tender shall be signed by the person legally authorised to enter into commitments on behalf of the Tenderer. All pages of the Tender document and other required documents are to be **signed by the authorised signatory with Company's seal**. Tenders are to be submitted in two parts as described below.

(a) **TECHNO-COMMERCIAL BID:** Scanned copy of the EMD, Cost of Tender and all other required documents duly signed and sealed by the authorized signatory, as stated below, are to be uploaded in CPPP and a hard copy of the same to be addressed to the Chief Manager (Project) at BBJ's Registered office in a sealed envelope, super scribing "TENDER NOTICE NO." and "TECHNO-COMMERCIAL BID" (**Non submission of any of the stated documents shall lead to rejection of the bid**):

- (i) Signed copies of documents as per Eligibility Criteria as per Clause No 2 of Special Conditions of Contract.
- (ii) Signed copy of **PAN, Goods & Service Tax (GST) registration certificates.**
- (iii) Signed copy of **Provident Fund & Employees State Insurance (ESI) Registration Certificate.**
- (iv) Certificate of the Incorporation of the Company/ Partnership Deed/ DIN/ CIN etc.
- (v) Company's audited Balance Sheet & Profit & Loss Account for last 3 (three) financial years ending 31st March of the previous financial year. However, in case balance sheet of the previous year is yet to be audited, the audited balance sheet of fourth previous year shall be considered.
- (vi) Downloaded Tender document (without quoting any price in Techno-Commercial Bid) duly signed with an official stamp on each page.
- (vii) **Solvency Certificate** (as per attached format) for at least **40%** of the advertised value of the tender.
- (viii) Integrity Pact as per Para 7 and Annexure-I.
- (ix) Any Bidder falling under Micro And Small Enterprises (MSEs) category, shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer:

Type under MSE	SC/ST Owned	Women Owned	Others (excluding SC/ ST & Women Owned)
Micro			
Small			

Note: - If the bidder does not furnish the above, the offer shall be processed construing that the bidder is not falling under MSE category.

(b) **PRICE BID:** The rates are to be properly filled up in appropriate space in BILL OF QUANTITIES (BoQ) of the Tender and uploaded on CPPP's website. **Price bid of only Techno-Commercially Qualified bidders shall be opened.**

7. **INTEGRITY PACT:**

The Bidder/ Contractor is required to enter into an Integrity Pact with BBJ, in the Format at Annexure-I. The Integrity Pact enclosed at Annexure-I will be signed by BBJ for and on behalf of Employer as its Agent / Power of Attorney Holder at the time of execution of

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Agreement with the successful Bidder. While submitting the Bid, the Integrity Pact shall be signed by the duly authorized signatory of the Bidder. In case of failure to submit the Integrity Pact duly signed and witnessed, along with the Bid, the Bid is likely to be rejected.

In case of any contradiction between the Terms and Conditions of the Bid Document and the Integrity Pact, the former will prevail. For monitoring of the Integrity Pact, BBJ has appointed the following eminent personality as Independent External Monitor(s) (IEM):

<p style="text-align: center;">Shri Sunil Pandey IFoS (Retd.) 249, Phase-I, Vasant Vihar, Dehradun - 248001. Uttarakhand Email: pandey.sunil90@yahoo.co.in</p>	<p style="text-align: center;">Dr. Ravindra Kumar Srivastava IAS (Retd.) A6, Anand Niketan, New Delhi - 110021 Email: srivastava.rks@gmail.com</p>
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8. All costs and expenses incidental to the preparation of the tender, discussion, conference, pre-award discussion with BBJ shall be borne by the bidder and BBJ shall bear no liability whatsoever on such cost expenses.
9. **Works Contract are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012.**
10. **No deviation to the tender conditions shall be accepted. Conditional tenders shall not be accepted, and no additional clause shall be entertained. BBJ reserves all rights in this regard.**
11. The award of the order or rejection of the Tenderer's offer and/or cancellation of the tender will be made at the absolute discretion of BBJ. BBJ reserves the right to cancel or accept or reject any or all tender(s), whether lowest or otherwise, without assigning any reason(s) whatsoever thereof. A tenderer, whose tender is not accepted shall not be entitled to claim any cost, charges or expenses incidental to or incurred by him through or in connection with the preparation and submission of the Tender/ Offer to BBJ.
12. **CURRENCIES OF BID AND PAYMENT**
The tenderer shall submit his price bid/ offer in Indian Rupees and payment under this contract will be made in Indian Rupees.
13. **Price Variation Clause (PVC) shall be applicable** as stated at Clause No. 15 of Special Conditions of Contract.
14. All duties, taxes, fees and other levies payable by the bidder under the contract or any other cause shall be included in the quoted price.
15. **PREFERENCE TO MAKE IN INDIA:**
The provisions of revised 'Public Procurement (Preference to Make in India) Order 2017' issued by Department of Industrial Policy and Promotion under Ministry of Commerce and Industry vide letter no. P45021/2/2017-PP (BE-II) dated 16th September 2020, as amended from time to time up to Bid Due Date, shall be applicable to the bidding process and award of the contract shall be done accordingly.

Please enter the percentage of local content in the material being offered. Please enter 0 for fully imported items, and 100 for fully indigenous items. The definition and calculation of

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local content shall be in accordance with the Make in India policy as incorporated in the tender conditions.

16. **PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA):**
For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/Non-Local Supplier and purchase preferences to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 4th June 2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT.
17. **COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (XI) OF GFR 2017**
- I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. The Competent Authority for the purpose of this Clause shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).
- II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any Bidder branch or office controlled by such person, participating in a procurement process.
- III. "Bidder from a country which shares a land border with India" for the purpose of this Clause means:
- a) An entity incorporated established or registered in such a country; or
b) A subsidiary of an entity incorporated established or registered in such a country; or
c) An entity substantially controlled through entities incorporated, established or registered in such a country; or
d) An entity whose beneficial owner is situated in such a country; or
e) An Indian (or other) agent of such an entity; or
f) A natural person who is a citizen of such a country; or
g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.
- IV. The beneficial owner for the purpose of (III) above will be as under:
18. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation-

- a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company.
b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements.

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19. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership.
20. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person has ownership of or entitlement to more than fifteen percent of the property or capital or profits of the such association or body of individuals.
21. Where no natural person is identified under (19) or (20) or (21) above, the beneficial owner is the relevant natural person who holds the position of senior managing official.
22. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
23. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

Note:

- i. The bidder shall provide undertaking for their compliance to this Clause, in the format provided in Annexure-A.
- ii. Registration of the bidder with Competent Authority should be valid at the time of submission of bids and at the time of acceptance of the bids.

24. **VALIDITY OF TENDER**

90 (ninety) days from the date of opening of tender or for a further period if mutually accepted. BBJ reserves the right to ask for the extension of validity if any.

25. **ORDER OF PRIORITY OF CONTRACT DOCUMENTS:**

Where there is any conflict between the various documents in the contract, the following order of priority shall be followed i.e., a document appearing earlier shall override the document appearing subsequently:

- 1) Work order
- 2) Letter of Award (LOA)
- 3) Schedule of Items, Rates & Quantities
- 4) Special Conditions of the Contract (SCC)
- 5) Technical Specifications (TS)
- 6) Scope of Work (SOW)
- 7) Drawings
- 8) Relevant Codes & Standards
- 9) Notice Inviting Tender
- 10) Instructions to the Bidders (IB)
- 11) General Conditions of Contract
- 12) Any other documents forming part of the Contract.

26. **Bidder should submit the documents in Hard Copy on or before as stipulated in "DATE & TIME SCHEDULE" to the address as mentioned above.**

SCOPE OF WORKS

NAME OF WORK: CONSTRUCTION OF ROAD OVER BRIDGE IN LIEU OF LEVEL CROSSING NO. 476 IN BANDA-MANIKPUR SECTION.

The scope described hereunder is only indicative and shall be deemed to be inclusive of all items to be executed for successful completion of the work as per Specifications and Drawings.

Bidder to read understand and consider all the conditions, special & additional special conditions, instructions, specifications, work scope etc. before quoting rates.

- 1. INDICATIVE SCOPE OF WORK: (IN GENERAL, BUT MAY NOT BE LIMITED TO):**
The job to be carried out in accordance with the BOQ and as advised by the site-in-charge and also consists of the followings:
- 1.1 Preparation of all detailed structural drawings and arranging approval of competent authority all complete. It also includes preparation of Quality Assurance Plan (QAP), for sub-structure, foundation, super-structure including stud welding and supply and installation of bearings.
 - 1.2 Construction of RCC open foundation / pile foundation & pile cap as per approved drawings. Construction of RCC abutments and piers, for Composite Plate Girders /Bow String Girders and for PSC/RCC Girders as per approved drawings.
 - 1.3 Preparation of Temporary Arrangement Drawings (TAD), Launching Scheme and approval thereof for approach portion.
 - 1.4 Construction of Post tensioned Pre-stressed (PSC) Girder and erection over piers on approach portion.
 - 1.5 Construction of approaches which includes constructing of RE wall, RCC slab, piers, crash barrier, earthwork in bank, providing bituminous road & all works related to constructing approaches complete as per drawing.
 - 1.6 Providing and fixing in position standard fixed type POT bearing, free sliding type POT cum PTFE bearings/ Elastomeric bearings as per approved drawing
 - 1.7 Providing and laying cement concrete wearing coat, drainage spouts, footpath, etc.
 - 1.8 Providing and fixing RCC crash barrier, railing and electric lighting poles.
 - 1.9 Providing and fixing in position single strip seal elastomeric type expansion joints.
 - 1.10 Construction of Inspection platform, railing, ladders, etc.
 - 1.11 Construction of staircases.
 - 1.12 Providing and fixing of protection screens
 - 1.13 Making any temporary work for the purpose or arranging any temporary land for the working or stacking of materials of contractor.
 - 1.14 All necessary testing facilities of materials, consumables, plants & machinery under the

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scope of Successful Bidder.

- 1.15 Successful Bidder shall develop two number site office within 15 days from the date of LOA. Office containing infrastructure and tools are under the scope of Successful Bidder. Vehicle for transportation in connection with the work are under the scope of Successful Bidder.

2. OTHER SCOPE OF WORK OF THE SUCCESSFUL BIDDER

- 2.1 Arrangement of labours, supervisors, riveting and bolting gangs, welding and engineers to deliver the jobs in time.
- 2.2 Taking approval of camber, site welding at joints and apply of paints of pain span from Railway representatives is the responsibility of the Successful Bidder solely.
- 2.3 The rate of the Successful Bidder includes cutting of plates, angles, channels etc. and welding for making temporary arrangements, required for the erection of spans
- 2.4 The rate of the Successful Bidder includes Electricity/ Power, Water, Hutment, etc., as may be required from time to time for the successful execution of entire work.
- 2.5 The rate of the Bidder includes Service Roads & Approach Road on the project site, if required for the successful execution of entire work.
- 2.6 The rate of the Bidder includes erection and dismantling of link members and other false work gadgets, demolition of temporary RCC Pedestals, loading, handling, re-handling of bridge components of anchor span, link members and other false work gadgets and store materials on trucks and trailers before winding up of the site.
- 2.7 The Bidder will take care about safety arrangements of their workers and will follow all safety rules during the execution of work

3. MILESTONE AND TIME SCHEDULE:

The time allowed for execution of the works is 15 months (fifteen months) from the date of issue of letter of acceptance from BBJ. The contractor shall be expected to mobilize and commence execution of the works within 10 (days) from issue of Acceptance Letter. If the contractor commits defaults in commencing execution of the works as afore stated, BBJ shall without prejudice to any other right to remedy, be at liberty to forfeit fully the Earnest Money Deposit and performance guarantee of the contractor.

Milestone Targets	Time allocated within which to achieve completion in total 15 (Fifteen) months' Time
(a) Physical commencement of work	D + 10 days
(b) Mobilization of equipment's	D + 20 days
(c) Full mobilization of plant, machinery, men and material	D + 30 days
(d) Construction of diversion of Road	D + 50 days
(e) Construction of foundation	D + 125 days
(f) Construction of substructure (Abutments & Piers)	D+125 to D+200 days
(g) Construction of Pier Cap	D + 100 to D + 225 days

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(h) Fabrication and launching of steel superstructure	D + 50 to D+ 275 days
(i) Construction of deck slab including foot path, crash barrier, RE wall, RCC slab/Girder, railing, etc.	D +200 to D + 250 days
(j) Earthwork in embankment, Asphalted Road, rolling etc. complete	D +200 to D + 320 days
(k) Completion of providing & fixing of protection screens, cables, testing, etc.	D +325 to D + 390 days
(l) Providing and fixing Road sign boards, Lighting arrangements, painting etc. final Finishing and clearance / tidying up of site completely.	D +390 to D + 450 days

Note: "D" is the date of approval of drawing by BBJ/Railways to the contractor.

4. PROGRESS OF WORKS:

The contractor shall submit a programme of work in the form of a Bar Chart of all the activities in consistency with milestone target envisaged below.

In case this bar chart requires to be modified, the Engineer and the contractor shall agree upon a time and progress chart. The chart shall be prepared in direct relation to the time stated as 15 months for the completion of the works as the milestone targets specified below of these special conditions. It shall indicate the forecast of the dates of commencement and completion of various activities of the work and may be amended as necessary by agreements between the Engineer and the contractor within the limitation of 15 months as overall completion period.

5. ACHIEVEMENT OF MILESTONE PROGRESS:

In order to ensure progress during the execution of the work the contractor will be expected to achieve the following milestone targets ahead of dates mentioned against each. Failure to achieve accomplished milestone targets within allocated timeframe, save for reason accepted as laid by the Engineer shall create and constitute the ground for failure on the part of contractor for maintaining progress of the work as per agreed programme.

Work is to be carried out in a way to cause minimum inconvenience to passengers on platform/L-xings and taking all safety measures against any infringement with running trains or passengers.

After successful inspection of the fabricated components appropriate surface treatment as specified by Railway shall be rendered & components transported to the site.

Technical Specification

1. WELDING PROCEDURE:

- 1.1 All the welding shall be done by Submerged Arc welding (SAW) process either fully automatic or semi-automatic. Manual Metal Arc Welding (MMAW) shall be done only for welds of very short run of minor importance or at inaccessible locations with prior permission of engineer. Provision of IS-823-1964 and IS-4353-1967, shall generally be followed, as applicable, for welding procedure, details of workmanship, correction of welding faults, peeling, painting etc. In case any of the provisions contained therein contravenes the provisions made in Railway Welded Bridge Code, the latter shall be followed. Welding shall be done by RDSO approved welders only.
- 1.2 No welding work shall be given to a contractor who does not produce satisfactory evidence of his ability to handle the work in a competent manner. The contractor shall also prove the ability of the Operator/Welders employed by him to produce welds of the required strength. The contractor shall employ a competent welding supervisor to ensure that the quality of materials and the standard of workmanship comply with the requirements laid down in the Railway's welded bridge code and relevant IR B&S standard codes. Contractor maintain all the record of welding as per BS 110(R).
- 1.3 The sizes and length of welds shall be not less than those specified in the drawings, nor shall they be substantially in excess of the requirements without prior approval of the Engineer. The location of welds shall not be changed without prior approval of the Engineer. Welds shall preferably be made in a flat position.
- 1.4 The preparation of fusion faces, angle of preparation root radius and root face shall be as specified in IS: 823-1964 and IS: 4353-1967. Where the gap between the root faces of a butt joint is excessive, the gap shall not be bridged since this procedure often leads to cracking. The fusion faces of the joint shall be build-up with weld metal to give the appropriate gap before the weld proper is commenced.
- 1.5 Splices in each component part of a solid web girder or built-up member shall be made before such component part is welded to other component part of the member. Splicing shall be done at the approved location only for making up section of larger length. Two components/ plates to be joined by Butt Welding of Radiographic quality only.
- 1.6 In making welds under conditions of severe external shrinkage restraint, the welding shall be carried out with electrodes having type 6 covering as per IRS-M-28.
- 1.7 In making butt welded joints in rolled shapes, the sequence and procedure of welding shall be such as to take into account unequal amount of expansion or contraction in elements being welded. The welding in the thinnest element of a section (usually the web in case of beams) shall be done prior to the welding of the thicker elements (usually the flanges in case of beams).
- 1.8 In case of welding using direct current, earthing on the work pieces to be welded shall be connected carefully at more than one location with a view to avoid "Arc Blow" during welding.
- 1.9 The sequence of welding shall be such as to minimize distortion/ deformation. Wherever possible, the members which offer the greatest resistance to compression are welded first.

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- 1.10 All slag shall be removed from each run before another run is super-imposed and from the final run. When cold, the final run shall be protected with clean boiled linseed oil and shall not be painted until approved by the Inspector.
- 1.11 In case of welds in structures subjected to dynamic loading, adequate means of identification, either by identification stamp or other records, shall be provided to enable each weld to be traced to the welding operator by whom it was made.
- 1.12 During the entire welding and cooling cycle, the joints shall not be subjected to any external forces or shocks.

2. SUB-MERGED ARC WELDING:

- 2.1 Main section of the components shall be framed only be submerged Arc welding. Neither the depth of fusion nor the maximum width in the cross section of weld metal deposited in each weld pass shall exceed the width of the face of the weld pass.
- 2.2 All butt welds by the submerged arc process shall be made in the flat and horizontal position. Fillets welds may be made in either flat or horizontal vertical position. The size of the single pass welds made in the horizontal-vertical position shall not exceed 8 mm. In addition to the provisions of IS:4353-1967, the inspector may, where deemed necessary, require a sample joint having the same cross-section as the joint to be used in construction and a length of at least 300mm to be welded with the wire, flux, current, arc voltage and speed of travel that are proposed to be used and a macro etched cross section of the welded joint prepared as a demonstration that the specified requirements will be met, when the welding current, arc voltage and speed of travel are established by a test made in accordance with requirements of this clause, they shall be kept within the following limits of variations
- Welding current ... $\pm 10\%$
Arc voltage ... $\pm 7\%$
Speed of travel ... $\pm 15\%$
- 2.3 Submerged Arc welding machine for heavy duty bridge girders shall be as per IRS Specification.

3. EDGE PREPARATION AND SET-UP OF PARTS:

- 3.1 Edge preparation shall conform to the relevant drawings and meet the requirement of IRS Welded Bridge Code. Normally all edges to be welded will be mechanically planned before members being subjected to welding.
- 3.2 After the parts are assembled in position for welding, the inspector shall check for incorrect root gap, improper edge preparation and other features that might affect the quality of welded joint.

4. INSPECTION AND TESTING OF WELDED JOINTS:

- 4.1 Inspection of the welded bridge girders shall be entrusted to RDSO.
- 4.2 The Inspector designated by the purchaser shall ascertain that fabrication by welding is performed in accordance with the requirement of welded Bridge Code and IS-822- code of practice for inspection of welds.

- 4.3 The contractor shall notify in advance of the start of any welding operation.
- 4.4 The contractor shall provide free access to the work being done at all reasonable time and facilities shall be provided to the inspecting authority so that during the course of welding, he may be able to inspect any layer of weld metal. The inspecting authority shall be at liberty to reject any material that does not conform to the provision of the welded Bridge code and to require any defective welds to be removed and re-welded.

5. MARKING OF DEFECTIVE WELDS:

- 5.1 The marking shall be positive and clear and in accordance with the method of marking followed and understood by the Inspector and shop personnel involved in making the repairs.
- 5.2 Marking shall be permanent enough to be evident until the repair has been done and inspection completed.
- 5.3 After the repair has been made, it shall be inspected and properly marked to indicate whether the repair is satisfactory or not.
- 5.4 EXTENSION PIECES: In fusion welds such extension pieces are to be welded which will serve the additional functions of running in/out pieces to ensure the soundness of full length of the weld. Extension pieces will be of the same composition and with the same weld preparation as the parent material of the main weld.
- 5.5 RADIOGRAPHIC TEST: All Butt welds shall be examined by appropriate Radiographic or any other equally effective method as specified in the drawing or procedure sheet.
- 5.6 DYE PENETRATION TEST: Other welding may be examined by Radiographic or any other non-destructive method like dye penetration test, Magnaflux and/or any other method at the discretion of the Inspecting Authority. DP material liquid shall be ISI & RDSO approved firm.
- 5.7 WELDING PARAMETERS: Contractor has to keep a record of welding parameters piece wise, component wise and bridge wise.
- 5.8 MISCELLANEOUS:
- 5.8.1 All material plates, angle etc. shall have straight edge, flat surface and free from twist. The adjacent surface or edge shall be in close contact or at uniform distance throughout.
- 5.8.2 The face of compression member shall be machined so that the faces are at right angles to the axis of the member and at the joint when made out will be in close contact throughout.
- 5.8.3 Contractors have to use mechanically controlled torch for flame cutting. All flame cut edges shall be ground properly to remove all burr etc. No drag line, bevel cut shall be permitted.
- 5.8.4 Contractors have to take special care to ensure that the ends of all plates and members are in close contact.
- 5.8.5 No making up of surface etc. will be allowed without ascertaining its structural adequacy by radiography testing.

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- 5.8.6 The contractor shall have to arrange use of hydraulic yoke hammer for riveting wherever possible.
- 5.8.7 Only full length of plates/angles/Roller section shall be used & no joints will be allowed in any of the components.
- 5.8.8 In the fabrication of girders, necessary arrangements and provision shall be kept for inspection facilities underneath the girder and for carriage of service cables, pipelines etc. as per approved drawing.

6. INSPECTION AND PROGRESS REPORT

- 6.1 The raw material and fabrication work shall be inspected by the Railway / BBJ through RDSO or RITES or as authorized by the Railway/ BBJ for which free accommodation, transport and other facilities will have to be provided by the contractor. The work of fabrication in the contractor's fabrication shop will at all times be open for inspection by the railway / BBJ or their authorized agents. Before dispatch of fabricated steel work from the shop, they will be inspected in the contractor's workshop by the Railway / BBJ or their agent who will thereafter issue inspection certificates. The tests will be carried out at contractor's cost. All facilities as required for carrying out the inspection will be provided free of cost by the contractor including those requiring the services of outside agencies & all measuring tools, gauges, template etc.
- 6.2 Any defects noticed during inspection in the execution of the work shall be rectified or replaced by the contractor at his own cost. The decision of the railways or its inspecting Bidder as to the existence of defect, the manner in which the defective work to be rectified or replaced shall be final, conclusive and binding on the contractors. No extra claim, whatsoever, shall be entertained for the cost of such rectification or replacement.
- 6.3 The progress of fabrication of steelwork as well as execution of all works shall be subject to periodic review by the Railway/ BBJ Administration.
- 6.4 The contractors shall provide all facilities to the BBJ/ Railway's representative to make periodical detailed assessment of the progress of the works. Such information and progress reports as may be called for by the BBJ/ Railway and at such intervals as specified shall also be made available.

7. SPECIFICATION FOR METALLISING ON BRIDGE GIRDERS

- 7.1 **SURFACE PREPARATION:**
The surface shall be thoroughly cleaned and roughened by compressed air blasting or centrifugal blasting with a suitable abrasive materials in accordance with clause 3 of IS-6586. Immediately, before spraying it shall be free from grease, scale, rust, moisture or other foreign matter. It shall be comparable in roughness with a reference surface produced in accordance with Appendix-A of IS: 5909 to Sa 2-1/2 and shall provide an adequate key for the subsequent sprayed metal coating.
- 7.2 **METAL SPRAYING:**
The metal spraying shall be carried out as soon as possible after surface preparation but in any case, within such period that the surface is still completely clean, dry and without visible oxidation. If deterioration in the surface to be coated is observed, by comparison with a

freshly prepared metal surface of similar quality which has undergone the same preparation, the preparation treatment should be repeated on the surface to be coated. The wire method shall be used for the purpose of metallising, the diameter of the wire being 3mm or 5mm.

Specified thickness of coating shall be applied in multiple layers and in no case less than 2 passes of the metal spraying unit shall be made over every part of the surface. At least one layer of the coating must be applied within 4 hours of blasting and the surface must be completely coated to the specified thickness within 8 hours of blasting. Aluminum wire brand approved by BBJ/ Railway.

- (a) **PURITY OF ALUMINIUM:** The aluminium to be used for spraying shall be 99.5% aluminium conforming to IS:2590.
- (b) **APPEARANCE OF THE COATING:** The surface of the sprayed coating shall be of uniform texture and free from lumps, coarse areas and loosely adherent particles.
- (c) **THICKNESS OF THE COATING:** The nominal thickness of the coating shall be 150 microns. The minimum local thickness will be determined in accordance with procedure given in clause 10.2 below and shall not be less than 110 microns at isolated location.

7.3 SHOP PAINTING FOR COMPONENTS BEING METALLISED

Any oil, grease or other contamination should be removed by thorough washing with a suitable thinner until no visible traces exist and the surfaces should be allowed to dry completely before application of paint. The coatings may be applied by brush or spray. If sprayed, pressure type spray guns must be used. One coat of etch primer to IS: 5666 shall be applied first. After 4 to 6 hours of the application of the wash primer one coat of zinc chromate primer to IS: 104-to-45-micron DFT. After hard drying of zinc chromate primer two coats of aluminum paint to IS: 2239 (brushing or spraying as required) shall be applied to a minimum thickness of 20 microns of each coat. All paint shall be Asian Paints, Berger Paints or Nerolac Paints, no other brand shall be allowed.

8. INSPECTION FOR SURFACE COATINGS:

8.1 Inspection after grit blasting to conform surface finish to Sa 2-1/2 of Appendix 'A' of IS 5909.

8.2 DETERMINATION OF LOCAL THICKNESS OF PAINT:

The minimum local thickness of paint shall be determined by the following method: The equipment used for measurement shall be any magnetic or Electro-magnetic thickness meter that will measure local thickness of a known standard with an accuracy of ± 10 per cent.

(a) CALIBRATION OF INSTRUMENT:

- (i) Calibrate and check the meter on one of the following standards (as appropriate): (Applicable to magnetic and Electro-magnetic meters other than the pull-off type). A soft brass shim, free from burrs, in contact with the grit-blasted surface of the base metal prior to its being sprayed. The thickness of the shim shall be measured by micrometer and shall be approximately the same as the thickness of the coating.
- (ii) A sprayed metal coating of uniform known thickness approximately the same as the thickness of the sprayed coating to be tested, applied to a base of similar composition and thickness of the article being sprayed, grit-blasted in accordance with Clause 9.2.1.

(b) PROCEDURE

For each measurement of local thickness, make prescribed number of determinations, according to the type of instrument used to get the average value. With instrument measuring the average thickness over an area of not less than 0.645 cm², the local thickness shall be the result of the one reading. With instruments having one or more pointed or rounded probes, the local thickness shall be the mean of three readings within a circle of 0.645 cm² area. With meters having two such probes, each reading shall be the average of two determinations with the probes reversed in position.

(c) **ELCOMETER:**

Minimum two digital Elcometer will have to be provided by the contractor at his own cost for determination of metalizing / painting thickness shall be available at site always. After completion of work handed over to Railway.

9. METHOD OF MEASUREMENT

For purpose of payment, quoted rates apply to the weights of steel work, calculated from final working drawing based on theoretical standard weights given in the producers hand books and using minimum square overall dimensions, no deductions being made for skew cuts, holes or notches. Each gusset shall be measured as equivalent to the dimensions of the smallest enclosing rectangle. The wastage of steel in the form of skew cuts etc. shall be the property of the contractor.

10. REJECTION OF MATERIALS

Bridge components shall be tested before leaving the manufacturer's premises. Bridge components will also be tested at the site and they may be rejected any time, if found not suitable or not in accordance with the specifications notwithstanding the results of tests at manufacturer's work shop or elsewhere or test certificates.

11. CODES AND SPECIFICATIONS

The materials as well as execution of works shall be conforming to the following specifications and codes of practice (Latest Revision of the Specification / Codes & up to date correction slips to be referred). Firms should quote their rate accordingly.

11.1 INDIAN RAILWAY STANDARD CODES AND SPECIFICATIONS

(i) IRS: Bridge Rules (1982 revised)

(ii) IRS: Sub-structure code

(iii) IRS: Welded Bridge Code for steel bridge girders (2001)

(iv) IRS: Steel Bridge Code (1962 revised)

(v) IRS specification: B1- 2008 for Fabrication and erection of steel bridges and locomotive turn tables.

(vi) IRS specification: B2: 1979 erection and riveting of steel bridge girders.

(vii) Indian Railways Schedule of Dimensions for broad gauge.

(viii) North Central Railway Engineering Department General Conditions of contract (GCC) and instructions to tenderers.

(ix) North Central Railway Engineering Department Standard Schedule of Rates 2010.

(x) North Central Railway Engineering Department Standard Specifications for material and works, 2007.

(xi) IRS specification: M-28 Specifications for electrodes.

(xii) IRS specification: M-39 Specifications for wire flux for SAW.

(xiii) IRS specification: M-46-2003

(xiv) Indian Railways Bridge Manual, 1998

(xv) Indian Railways P. Way Manual

(xvi) Indian Railways Works Manual

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11.2 INDIAN STANDARD SPECIFICATION

1. IS : 2062-1999 Specification for structural steel.
2. IS:812
3. IS : 813-1961 Scheme of symbols for welding.
4. IS : 9595-1980 Manual for metal arc welding.
5. IS : 818-1968 Code of Practice for safety and Health requirements in electric and gas welding operations.
6. IS : 102-1962 Specifications for ready mixed paints red lead.
7. IS : 123-1962 Specifications for ready mixed paints red oxide.
8. IS : 2004-1978 Carbon steel forgings for general engineering purposes.
9. IS : 1852-1979 Rolling and cutting tolerances for hot-rolled steel products.
10. IS : 1148 Rivet bars for structural purposes.
11. IS : 1929-1982 Hot forged steel rivets for hot closing (12 to 36mm diameter).
12. IS : 4353-1967 Recommendations of Sub-merged Arc welding of mild steel and low alloy steel.
13. IS : 1893-1975 design criteria for Earthquake Resistant structure, Indian Standard Institution, New Delhi.
14. IS : 8500- Structural steel- Micro alloyed (Medium and high strength qualities).
15. IS : 1149- High tensile steel rivet bars for structural purposes.
16. IS : 1363 (all 3 parts)- Hexagon head bolts, screws and nuts of product of grade C.
17. IS: 2001- Carbon steel forging for general engineering purposes.
18. IS: 57- Red lead for paints and other purposes.
19. IS: 77- Linseed oil, boiled for paints.
20. IS: 2339- Aluminum paints for general purposes in steel container.
21. IS: 280- Mild steel wire for general engineering purposes.
22. IS: 814- Covered electrodes for manual metal arc welding.
23. IS: 1182- Radiographic examination of butt joints in steel plates.
24. IS: 2595- Radiographic testing.
25. IS: 800- general construction in steel.
26. IS:808- Dimensions of hot rolled steel beam, column, channel & angles
27. IS: 786- Conversion factors and conversion tables.
28. IS: 1024- Welding in bridges and structures subject to dynamic loading.
29. IS: 1261- Seam welding in mild steel.
30. IS: 1367 (all 20 parts) – Threaded steel fasteners.
31. IS: 6639- Hexagonal bolts for steel structures.
32. IS: 104- Ready mixed paint, air drying, brushing, zinc chrome, priming.
33. IS: 2074- Ready mixed paint, air drying, red oxide – zinc chrome priming.
34. IS: 1270- Metric steel tape measure.
35. IS: 487- Brush, paint and varnish.
36. IS: 1030- Carbon steel casting for general engineering purposes.
37. IS: 3400 (all 22 parts)- method of test for vulcanized rubbers.
38. IS: 1915- Steel bridge code
39. IS: 3502- Steel chequered plates
40. IS: 6586- Metal spraying for protection of iron steel
41. IS: 5666- Etch primer
42. IS: 7202- Safety Code for erection of steel structures
43. IS: 8629- Protection of iron and steel structures from atmospheric corrosion.
44. IS: 5624- Foundation Bolts
45. IS: 7215- Tolerances for fabrication of steel structures
46. IS: 432- Earth quake resistant design and construction of buildings.
47. IS: 34- White lead for paints
48. IS: 887- Animal tallow

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49. IS: 816- Metal Arc Welding for general construction in mild steel
50. IS: 819- Resistances spot welding for light assemblies in mild steel.
51. IS: 1323- Oxy-acetylene welding for structural work in mild steel.
52. IS: 7293- Safety code for working with construction machinery.
53. IS: 817- Training and testing of metal arc welders.
54. IS: 1200 (all relevant parts) – method of measurement of building and civil engineering works.
55. IS: 8112-43 grade OPC.
56. BS 110 CR with latest amendment.
57. BS-111 for HSE Bolt.

11.3 MATERIAL:

- 11.3.1 Contractor has to procure all the raw materials from SAIL, TISCO, IISCO or RINL only.
- 11.3.2 All structural section should conform IS-2062 Gr. B. fully killed, fully normalized also if plate thickness is >12 mm.
- 11.3.3 All round bars used for making rivets shall be as per IS-1148 & turned bolts etc. shall be manufactured as per IS 1875.
- 11.3.4 All structural bearing shall be made from steel conforming to IS: 2004 & IS 2062 grade B fully killed and fully normalized ultrasonically tested steel section only.
- 11.3.5 All material shall be free from surface defects like notches, dents, bends excess rolled material, over/under dimensions.
- 11.3.6 Rolling & Cutting tolerances shall be in accordance with IS 1852.

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ADDITIONAL SPECIAL CONDITIONS OF CONTRACT (PART-I)

1. Execution of any work under this contract will be done as per the provisions of following Codes/ Specifications / Manuals / Rules / Guidelines / Technical Circulars and contractor will comply with all provisions of these below-mentioned documents. Rate of items are inclusive of all methods/procedures of various activities involved in execution for particular item detailed in these documents, unless otherwise written in Special Conditions of Contract.
 - 1) Guidelines for Earthwork in Railway Projects (Guideline No. GE: G-1)
 - 2) Guidelines & Specifications for Design of Formation for Heavy Axle Load (GE:0014)
 - 3) Specification No. RDSO/2018/GE: IRS-0004 (D) Part-IV dated 25.07.2019
 - 4) Guidelines for cutting in Railway Formations-2005 (GE:G-2)
 - 5) Indian Railway Bridge Rules
 - 6) Indian Railway Bridge Manual
 - 7) IRS Code of Practice for Plain, Reinforced & Prestressed Concrete for General Bridge Construction (Concrete Bridge Code)
 - 8) IRS Code of Practice for the Design of Sub-Structures and Foundations of Bridges (Bridge Sub-Structures & Foundation Code)
 - 9) IRS Specification for Fabrication and Erection of Steel Girder Bridges and Locomotive Turn-Tables (Fabrication Specification)
 - 10) IRS Code of Practice for the Design of Steel or Wrought Iron Bridges Carrying Rail, Road or Pedestrian Traffic (Steel Bridge Code)
 - 11) IRS Manual on the Design and Construction of Well and Pile Foundations (Well and Pile Foundation Code)
 - 12) IRS Code of Practice for Metal Arc Welding in Structural Steel Bridges Carrying Rail, Rail-Cum-Road or Pedestrian Traffic (Welded Bridge Code)
 - 13) IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code)
 - 14) IRS Code of Practice for the Design and Construction of Masonry and Plain Concrete Arch Bridges (Arch Bridge Code)
 - 15) Indian Railways Permanent Way Manual
 - 16) Guide lines for handling and stacking of rails CT-35
 - 17) Manual of Instructions on Long Welded Rails
 - 18) Indian Railways Small Track Machine Manual
 - 19) Specifications for Track Ballast IRS-GE-1
 - 20) Indian Railways Code for the Engineering Department
 - 21) Indian Railways Schedule of Dimensions 1676mm Gauge (BG)
 - 22) National Building Code 2005
 - 23) Any BIS/IRC Code referred in above listed documents
 - 24) Instructions circulated by Railway Board/ RDSO/ NCR HQ etc.
 - 25) Any other Codes , Manual & Circular as per the need All above-mentioned codes/manuals etc. are freely available on websites of Indian Railways/ IRICEN. If contractor is not able to find any code/manual on internet, he may get it from office of AXEN/XEN/Dy.CE/Bridge in soft copy. Any document (e.g. IS Codes) which are sold online/offline by BIS or any other Bidder, the contractor must get it on his own.
- 1.1 Various BIS / IRC Codes are referred in BIS/IRC Code itself. Those referred BIS/IRC Codes will also apply in contract and the contractor will comply with provisions of the referred BIS/IRC Codes too.
- 1.2 If work is being carried out as per RDSO drawing/any other drawing approved by Railway, material to be used, processes involved in fabrication/erection of structure etc. will comply with drawing. The contractor will follow the all instructions conveyed through the notes of

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drawing or any other means.

- 1.3 For items not covered by IRS and BIS Codes, provision of IRC Codes and MOST Specification are to be followed in successive that order.
- 1.4 Bar charts in tabulated form have been briefed in the scope of work to these conditions. After issuance of LOA, contractor will submit detailed bar charts in line with these bar charts and get it approved from BBJ / Railway.
- 1.5 Contractor will prepare Design Basis Report (DBR) for important bridges and obtain approval of RDSO as per guidelines of RDSO Report No. BS-112 within time frame as shown in bar chart if required and required by BBJ / Railway.
- 1.6 The contractor will prepare the Quality Assurance Program for all activities required to complete the work (e.g. center line of bridge, concreting, steel, construction material to be used) and get it approved from BBJ/ Railway.
- 1.7 The contractor will prepare a Method Statement for all activities required to complete the work keeping time frame of bar chart in mind and get it approved from BBJ / Railway.
- 1.8 In case of any disputes regarding interpretation of any of the clause, decision of the concerned Railway and BBJ, shall be final and binding on the contractor/s.
- 1.9 Plea of Custom: The plea of custom prevailing will not on any account be permitted as an excuse for an infringement of any of the conditions of the contract or specifications.
- 1.10 Important events/construction stages will have to be recorded by contractors in still and digital video format at his own cost and will be handed over to BBJ and Railways for record.

12. WORKING METHOD AND PROJECT MONITORING:

The contractor shall submit within the time frame stipulated by the Engineer-in-charge. The details of actual method to be adopted by contractor for the execution of any item at each location support. The relevant working drawings as plants and machinery to be used for method handling for approval of Engineer-in-charge, who reserves the right to suggest alteration/modification in proposed method, which shall be binding on the contractor and no claim on account of such changes in method of execution will be admissible.

The contractor shall submit an additional program for work commencement of work by preparing bar chart. PERT / CPM chart on computer using MS project for approval of Engineer-in-charge. This program will be reviewed at different stages of work.

13. DESIGN AND DRAWINGS:

The contractor will have to collect the site details required for design and submit detailed structural design and drawing for any component if required for the foundation, substructure, Retaining wall or toe walls etc. incidental to work. Except those components, for which Railway's standard drawing are available, as per the direction of Engineer-in-charge and the same will be submitted to the railways in required format duly proof checked by proof consultants of any of IIT's/NITs for final approval of railways along with all supporting input & output data with software used in the design & drawing to enable checking by the Railway's authorities. Nothing extra shall be paid on this account.

14. Contractors will have to drill bore holes for geotechnical investigation for development of

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design input data of foundations. He may encounter standing/flowing water in river course. Contractor has to develop earthen island/coffer dam for construction of piles/foundations. Same earthen island/coffer dam can be used for exploratory drilling/sampling/data collection/in-situ testing. Payment for such temporary earthen island/ coffer dam will be made under relevant SOR/NS item only once. Contractor must organize these activities accordingly. The rate for forming an earthen island /coffer dam shall, unless otherwise stipulated, include the cost of its construction, its maintenance for the period of utility and its removal to the extent ordered.

15. Completion Drawing:

On completion of work the contractor will submit completion drawing of the work, structures & bridges covered under scope of contract (as directed by Engineer-in-charge) to the BBJ on editable softcopy (.pdf not applicable) with three sets of hard copies and on reproducible tracing film of 75-micron double matt type of approved quality available in the market for record. The rate includes for submission of completion plan and nothing extra will be paid for this work. If the same is not submitted before or along with final bill then recovery at the rate of 0.2% of the overall gross payment of the contract paid to contractor will be recovered from the contractor's dues. This recovered amount will be released only after receiving of completion drawing within 2 month from the date of passing of final bill to this office after this period; this recovered amount will stand forfeited.

If work is terminated then contractor has to submit completion drawing of the portion of work executed by him, otherwise action as stated above will be taken.

16. Transport Arrangement:

The work at entire stretch will be supervised by two or more BBJ and railway supervisors, contractor shall provide & maintain proper transport facilities (at least 2 nos road vehicles) for efficient transport of men and material. Timely and adequate transport facilities in the form of well-maintained road vehicles like Ertiga /Scorpio/ Tavera/ TUV 300/ Innova or similar (not older than 3 years) etc. with fuel and driver for 24hrs availability during entire completion period of work. No extra/additional payment will be made to the contractor for this arrangement. In case of contractors failures to maintain these facilities, Rs.1500/- per day per vehicle shall be deducted from running bills as a deterrent. In this regard the decision of the Engineer in charge shall be final and binding upon the contractor.

17. BBJ/ Railways can get the work supervised through BBJ and Railway Officials or PMC.

18. Contractor will develop Two site offices at his own cost within 1 months from date of issuance of LOA. These site offices can be developed with prefabricated material. The contractor will maintain these site offices throughout the contract period, free of cost. He will deploy a suitable person whenever site office is used by BBJ and railway officials.

This site office must have the following infrastructure, T&P and other facilities for use of BBJ and railway or PMC officials:

i) Office of minimum 50m² area with toilet, pantry etc.

ii) 24-hours lighting arrangement

iii) Office must be air-conditioned.

iv) 24-hour watering facility

v) Dining table set, sofa set, executive /visitors chairs, almira, 3 computer tables, color printer for A3 size with fax /email etc. of decent make and quality Contractor

vi) Laptop for office having configuration of OS Window 10 64-bit, display size

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minimum 14 inches, intel core i3 processor with minimum clock-speed of 2.3 Ghz, 8 GB RAM, 512 HDD capacity, Li-ion 3 cell battery with Computer Data Entry operator. Supervisor in-charge may carry the laptop with him.

vii) LED display of minimum 50" No payment whatsoever will be made to contractor for development and maintenance of site offices. All construction material, accessories, furniture etc. will be the property of the contractor after completion of work. Any delay in setting up of these site offices, which may hamper progress of work, will be on account of the contractor.

- 19.** Contractor will deploy following personnel at site, as per approved work plan, minimum number of personnel for the key positions with requisite qualification and experience as mentioned below,

(S.No.)	Position	Minimum No. of Personnel	Minimum qualification	Minimum Experience in Similar Work [years]	
NOTE	1	1	Graduate in Civil Engineering	10 years, out of which 3 years in-charge of road/ Railway project (For Graduate) , 16 Years out of which 3 years in-charge of Road/Railway project (For Diploma)	
	2	Sr. Engineers			
		(a) for Bridge concrete& Earthwork etc. works	2	Graduate in Civil Engg.	5 Years
		(b) for Bridge steel work	1	Graduate/Diploma in Civil/Mechanical Engg.	5 Years for Graduate, 10 years for Diploma holder
	3	Junior Engineer/Supervisors			
		(a) for Bridge concrete& Earthwork etc. works	4	Diploma in Civil Engineering	5 years
		(b) Bridge steel work	2	Diploma in Civil/Mechanical Engineering	5 years
4	Surveyor for setting out alignment, layouts and levels periodically	2	Diploma in Civil Engg.	5 years	
5	Material Testing-cum-Quality Control Engineer	1	Minimum Diploma in Civil Engg.	5 years	
6	Safety Officer	1	Preferably Graduate in any discipline but must have completed Diploma in industrial safety management OR construction management.	5 years	
7	Draftsman with knowledge of AutoCAD	1	Diploma in Civil Engineering /AutoCAD	3 years	

NOTE:

- (a) Project Manager is to be deployed within 30 days of the issue of Letter of Acceptance. The program for deployment of other personnel shall be conveyed by BBJ/ Railway/ PMC and personnel shall be deployed within 30 days of the stated requirement. In case of failure to deploy any personnel within 30 days of the stated requirement, a penalty shall be imposed for each day of delay as under:

- (i) Rs 10,000 per person per day for Project Manager & Safety Officer.
 (ii) Rs 5,000 per person per day for Sr. Engineers, Surveyor &Material Testing-cum-

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(iii) Rs 3,000 per person per day for other personnel

- (b) The decision of the Engineer-in-charge as to the period for which the required technical staff was not employed by the contractor and as to the reasonableness of the amount to be deducted from the contractor, shall be final, & binding on the contractor.
- (c) During Working days (i.e. the days during which technical work is required, maximum as 25 days per month), if technical supervisor is present less than required days in any month, deduction of Rs. 1600/- per day for graduate engineer & Rs. 1000/- per day for a diploma holder will be made from the bill of the contractor.
- (d) On completion/likely completion of activities concerned to particular personnel, demobilization of that personnel shall be requested by the contractor at least 30 days in advance and demobilization shall be done with the of BBJ/ Railway/ PMC only. In case demobilization is done without approval of Railway/PMC, the penalty mentioned above, as relevant, shall be imposed for each day of absence of the personnel.

In case demobilization is done without approval of BBJ/ Railway/PMC, the penalty mentioned in sub-clause (b) above, as relevant, shall be imposed for each day of absence of the personnel.

- 20.** List of essential minimum equipment's to be maintained at site: The contractor shall deploy, the minimum number of equipment for execution of the work as per mutually agreed programme as mentioned hereunder:

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S.No.	Equipment Type and Characteristics	Min. Number Required
1	Earth excavation and loading equipment (Excavator)	2 Set
2	Earth moving equipment (Dumper)	4 Nos.
3	Earth levelling and grading equipment (Grader)	2 Nos.
4	Earth compaction equipment(Vibratory Rollers)	2 Nos.
5	Truck mounted water tank/sprinklers	4 Nos.
6	Concrete Vibrating equipment	6 Nos.
7	Total stations	2 Nos.
8	Auto levels	2 Nos.
9	Transit mixers[6 cum]	2 Nos.
10	Fully equipped soil, aggregate and concrete testing Laboratory	2 set
11	Self-loading transit mixer (Fiori)	4 Nos.
12	Weigh batchers and concrete mixers	4 Nos.
13	Gensets of suitable capacity to drive batching plant, lighting, offices, other machinery	As decided with engineer
14	Fabrication workshop with complete set of equipment's	As decided with engineer
15	Suitable capacity concrete pumps and/ or boom placer	As decided with engineer
16	Fully automated/computerized concrete batching plant of minimum 30 cum/hr. capacity, one at each important bridge site	As decided with engineer
17	Cranes	2 Nos.
18	Hydras	2 Nos.
19	JCBs	2 Nos.

Note:

1. Above equipment list is not exhaustive and contractor may have to deploy additional equipment, at his cost, to maintain and achieve the work plan. Deployment will be worked out in consultation with engineer and in case of dispute; engineer's decision will be final. Any equipment not required further can be demobilized with the prior approval of the Engineer.
2. The records of mutually agreed programme of deployment as well as request for demobilization of any equipment/plant and approval of the same should be maintained in a register.
3. The type of equipment specified can be changed by the Engineer depending upon suitability of the equipment as per site conditions with the approval of BBJ/Railway concerned subject to that the total rate of production/output of proposed number and type of equipment should be equal to or more than that of the number and type of equipment stipulated in the contract agreement and quality of work is not compromised in any way;
4. Contractor will prepare a deployment scheme for above equipment's in accordance with agreed upon plan of work and get it approved from BBJ/ Railways. Demobilization or reduction in machinery can be allowed during the course of work, subject to progress of work not getting hampered. Failure to provide the above machinery will result in a penalty of Rs. 2000/- per day.

- 21. The contractor will arrange to carry out good quality drone survey of various stages of construction at least 3 times in a year, at times advised by Engineer and submit video to BBJ and railway. Also, the contractor has to arrange good quality photographs and**

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recording of videos at important stages of construction of the work. Further as per Railway Board's Instructions CCTV camera is to be installed as directed by Engineer-in-charge. For this no extra payment will be done.

- 22.** Brands of materials in tenders of schedule items based on CPWD-DSR for improvement in quality of works No. 291-W/O/QC/policy, Dated: 22.03.2022.
- 23. Payment schedule for girder fabrication /erection/ launching after BBJ/ HQ/NCR approval of any design related to Proof check from IIT/NIT.**
(i) On supply of steel on work site/ work shop -30%
(ii) On Fabrication & assemblage - 20%
(iii) After complete launching 30%
(iv) After successful opening / Commissioning of FOB for public -20%
- 24.** Fabrication work shall be done either by RDSO approved vendors for fabrication of bridge girders or from the other vendors by following STR (Schedule Technical Requirements) and QAP (Quality Assurance Plan) approved by CBE, fabrication works in workshop.

The fabrication has to be done in a well-established factory / workshop having guided submerged arc welding facilities. The fabricated girder / column / other structural parts will be transported to the site of work by contractor's own means at his own cost. Any decision by BBJ/ Railway's representative regarding the minimum number of shuttering sets, jigs, plants, machinery etc in this regard shall be final and binding on the contractor.

The contractor shall ensure free / uninterrupted access to fabricator workshop for inspection during execution of work and ensure all arrangements/ facilities for inspection (inspection, transport & stay etc, if required).

- 25. Safety precautions:**
- (a) Contractor will follow all provisions of PCE Circular 103-R or any other circular / instruction communicated regarding safety at worksite strictly during execution of work.
- (b) Barricading/Fencing:
- (i) Contractor will provide barricading parallel to track as and when directed by Engineer. Barricading will be done as per the drawing given in said circular or any other drawing as directed by Engineer. The cost of this will be paid under relevant SOR/NS item.
- (ii) This fencing/barricading will be maintained till the time as directed by Engineer's representative. As this fencing gets damaged, stolen, broken due to many external factors, payment will be made for this under relevant NS item.
- (iii) If fencing is not found intact (as per drawing) by BBJ / Railway engineer at any time, penalty equal to the cost of fencing of damaged patch will be imposed. Entry regarding this will be made in site order book and information will be sent to authorized engineer via WhatsApp/e-mail.
- (iv) If a damaged patch is not repaired by contractor in next 3 days, a penalty of Rs. 100/- per meter per week or part thereof will be imposed till repairing is done.
- (c) If during execution of work situation arises that formation beside running track is used by road vehicles, contractor will ensure that fencing is intact in that stretch. If fencing is not intact even at a single place, which may endanger the safety of running trains, the contractor will provide manned barrier on both side of this stretch at his own cost till fencing is repaired.
- (d) Contractor at the direction of Engineer's bid representative will provide obstructions

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like excavation, placing of sleepers / cess ballast / released material, fencing, barrier etc. at the points from where road vehicles entry on formation parallel to track. No payment will be made for such activities.

- (e) Manning of barriers:
- (f) During execution of work situations will arise when vehicles will ply on railway formation/bed parallel to track. To control such movement, Engineer's representative can direct contractor to provide manned barrier at locations identified by him. The cost of manning will be paid under relevant SOR/NS item, as per the decision of BBJ/ Railway. The cost of the barrier will be borne by the contractor, and it will be their property. The barrier must be sturdy and with locking arrangement.
- (g) Before manning, contractor and Engineer's representative (BBJ/Railway) will jointly plan the scheme mentioning how much time will it take to complete the work in that patch. If work is not completed in that period, further manning will be done by contractor at his own cost. While deciding the completion period of that particular patch, quantum of work, original completion period of contract, bar chart submitted by contractor etc. must be considered. Engineer's representative will strive to minimize the requirement of manning. For example.
 1. Patch lying between two level crossings may be manned from one side and closed from another side, reducing manpower deployment to one.
 2. Manning can be done for the only period in which vehicles ply. If night working is not being done, manning will be done in day time only.
- (h) If work is not completed in stipulated time and manning of check points is also not being done by contractor, BBJ / railway will arrange manning by departmental manpower/ home guards/private guards/any other means. Recovery at double rate of cost of such arrangement will be made from contractor's dues.
- (i) In case the contractor has to ply vehicles for the purpose connected with the contract adjacent to Railway track the Railway Administration will be at liberty to post an experienced staff as flag man for guidance of the movements such vehicles so as to prevent accidents and the contractor will bear wages including all etc. of the staff posted as flag man for the period such staff is posted for the purpose.

The BBJ/ Railway Administration will be sole judge in the absolute discretion, of the fact that it is necessary to post any staff, that which of the staff will be suitable for the purpose, that what should be the wages and other allowance payable by the contractor for staff posted for the purpose. The BBJ/ Railway administration will have a right without prejudice to other remedies to deduct the wages etc. of such staff from the bills of the contractor in respect of this contract or from any moneys or the contractor whatsoever available with the Railway Administration. The contractor will be liable for any over payments under Workman Compensation Act on account of any injury sustained to BBJ/ Railway servant during that period.

- (j) Within the station premises, especially on passenger platform, or near the running track, contractor/s shall ensure sufficient free space for movement of passenger traffic. He must cover and protect the excavation carried out in such areas with a view to avoid the accidents. The works must be carried out most carefully in such a way that they do not hinder the railway operation except as agreed to by the railway.
- (k) The contractors shall see that no change is caused to railway signaling and transmission wire, stations, installation, communication lines, electric devices, trains of any kind, fencing as well as any rolling stock and in general to all railway installation and equipment in case any damage is caused to these due to the fault of the contractor on the part of anyone on his behalf all repairs there required will be carried out by the railway at the entire cost of the contractor and amount of expenses thus incurred will be recovered from the payment due to him

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- (l) The contractor shall be responsible for safe custody of tools and of the safety of his labour. He should ensure that labour on work removes their tools clear of the tracks on the approach of any trains. After the day work, the contractor should ensure that the tools are deposited proper tool box before the labours leave the work site. Tool issued should not be allowed to fall in unwanted hands who can tamper with the railway track.
- (m) The contractor shall employ one suitable supervisor to supervise the work at site. Though all the work relating to the safety of running trains shall be executed under railway supervisor, the presence of qualified supervisor from the contractor's side is a must at the site of work.
- (n) Normally, night working shall be avoided. A night working shall be permitted by BBJ/Railway in writing. One inspector shall be specifically deputed to supervise the night working. The site/area where night working is to be done shall be adequately lit. Nothing extra shall be paid for this.
- (o) The worksite shall be suitably demarcated to keep public and passengers away from work area. Necessary signage boards such as "Work in progress. Inconvenience is regretted" etc. shall be provided at appropriate locations to warn the public/passengers. Adequate lighting arrangement of worksite wherever required shall be done to ensure safety of public/passengers during night.
- (p) In the event of accident at the work site, a departmental enquiry shall be held and in case, it is established that the accident has occurred on account of contractor's negligence or the negligence of his men, penalties up to an upper limit of 10% of the total cost of the work shall be imposed on the contractor.
- (q) BBJ administration reserves the right to terminate the contract with immediate effect if the contractor is found responsible for causing an accident, without giving any further notice/notices to the contractor.
- (r) In the event of contractor not completing the work or leaving it unsafe at the end of day's work such that it may cause speed restrictions to be imposed, track shall be attended by the railway immediately at the contractor's cost without any further notice. In addition, the labour cost recoverable from the contractor, supervision charges @12.50% and train detention charges @ Rs. 50000/- every half hour or part thereof shall also be recovered.
- (s) In the event of contractor starting the job without proper supervision causing an accident, he may be prosecuted under Railway Act for unlawful interference with the railway track in addition to the recovery of Rs. 20000/- or value of actual loss, whichever is higher.
- (t) **Training to Supervisors and Operators of Contractor:** The supervisors and operators of the contractor proposed to be deployed at work site, which is close to the running track, shall be imparted mandatory training by the Railway at site free of cost about the safety measures to be adopted while working in the vicinity of running track. The engineering-charge of the work shall decide the scale, extent & adequacy of training. In case, training is imparted at a recognized Railway training institute, the charges for the same shall be recovered from contractor as per latest instructions available from BBJ/Railway. A competency certificate to this effect to the individual supervisor/ operator shall be issued by a Railway Officer not below the rank of Assistant Officer. No supervisor/ operator of the contractor shall work or be allowed to work in the vicinity of running track that is not in possession of valid competency certificate. All the labour, materials, tools, plants etc. except detonators, required for ensuring safe running of trains shall be provided by Contractor at his own cost. Wherever lookout men are provided by Railway, charges at the rate of Rs. 500/- per man day shall be recovered from Contractor. The Railway will not acquire any land for the purpose of movement of vehicles of the contractor/s in doing earthwork.

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- (u) In addition, instructions issued through various PCE/Rly circulars with all amendments regarding barricading, protection of running lines while working in vicinity of it should be strictly followed.
- (v) Storage of inflammables must be well away from site office/running track.
- 26.** Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra labourer shall be engaged for holding the ladder and if the ladder is used for carrying materials as will, suitable footholds and hand holds shall be provided on the ladder and the ladder shall be given an inclination not steeper than one horizontal to four verticals.
- 27.** Scaffolding or staging more than 3.5 meters above the ground or floor swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached bolted, braced and otherwise secured above the floor or platform of such scaffolding or staging and extending along the entire length thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
- 28.** Working platform gangways and stairways should be so constructed that they should not sag unduly or unequally, and where the height of the platform or the gangway or the stairway is more than 3.5 meters above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in the Para above.
- 29.** Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 10 metres in length while the width between side rails in swung ladder shall in no case be less than 300mm for ladder upto and including 3.5 metres in length. For longer ladders this width should be increased by at least 20 mm for each additional meter of length. Uniform steps spacing shall not exceed 300 mm. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sides of work shall be so stacked or placed as to cause danger for inconvenience to any persons or the public.
- 30.** The contractor shall provide all necessary fencing and lights to protect the public from accident, and shall be bound to bear the expenses of defence of every suit action or other proceedings at law that may be brought by any persons for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit action or proceedings to any such persons or which may with the consent of the contractor be paid to compromise any claim by any such person.
- 31.** Before any demolition work is commenced and also during the process of the work:
- (a) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- (b) No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
- (c) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion of flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.
- 32.** All necessary personal safety equipment as considered adequate by the Engineer-in-charge should be kept available for the use of the persons employed on the site and maintained in

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a condition suitable for immediate use and the contractor should take adequate steps to ensure proper use of equipment by these concerned.

- (a) Workers employed on mixing asphalt materials, cement and live mortar shall be provided with protective goggles.
- (b) These engaged in white washing and mixing or attacking of cement bags or any materials which are injurious to the eyes shall be provided with protective goggles.
- (c) Those engaged in welding works shall be provided with welder's protective eyesight lids.
- (d) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

33. When the work is done near any place where there is risk of drowning, all necessary equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any persons in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

34. Use of hoisting machines and tackle including their attachment anchorage and supports shall confirm the following standards or conditions:

- (a) (i) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defect and shall be kept in good repair and in good working order.
(ii) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.
- (b) Every Crane Driver or hoisting appliances operator shall be properly qualified and no person under the age of 21 years shall be in-charge of any hoisting machine including any scaffolding.
- (c) In case of every hoisting machine and of every cabin ring, shackle, swivel and pulley block used in hoisting or as means of suspension safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked within the safe working load. In case of a hoisting machine having a variable safe working load, each safe working load of the conditions under which it is applicable shall be clearly indicated. No part of any machinery or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
- (d) In case of departmental machine the safe working load shall be notified by the Electrical Engineer-in-charge. As regards contractor's machines, the contractor shall notify safe working load of the machine to the Engineer-in-charge whenever he brings any machinery to site of work, get it verified by the Electrical Engineer concerned.

35. Motors, gearing transmission, electric wiring and the dangerous part of hoisting appliances should be provided with efficient safe guards, hoisting appliances should be provided with such means will as reduce to the minimum the risk of accidental descent of the load, adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized insulating mats, wearing apparel, such as gloves, sleeves and both as may be necessary should be provided. The workers should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

36. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold ladder or equipment shall be altered or removed while it is use. Adequate washing facilities should be provided at or near places of work.

37. PRECAUTIONS WHILE WORKING IN THE VICINITY OF TRACK:

The Contractor shall not allow any road vehicle belonging to his or his suppliers etc., to ply in Railway land next to the running line. If for execution of certain works viz., earthwork for parallel Railway line and supply of ballast for new or existing rail line gauge conversion etc., road vehicles are necessary to be used in Railway land next to the Railway line, the Contractor shall apply to the Engineer-in-charge for permission giving the type and No. of individual vehicles, names and License particulars of the drivers, location, duration and timings for such work / movement. The Engineer-in-charge or his Authorized Representative will personally counsel, examine and certify, the road vehicle drivers, Contractor's flagmen and Supervisor and will give written permission giving names of road vehicle drivers, Contractor's flagmen and Supervisor to be deployed on the work, location, period and timing of the work. This permission will be subject to the following obligatory conditions.

- a) The road vehicles will ply on between sunrise and sunset.
- b) Nominated vehicles and drivers will be utilized for work in the presence of at least one flagman and one Supervisor certified for such work.
- c) The vehicles shall ply a minimum of 6 m clear of track. Any movement/work at less than 6 m and up to minimum 3.5 m clear of track center shall be done only in the presence of Railway employee Authorized by the Engineer-in-charge. No part of the road vehicle will be allowed at less than 3.5 m from track centre.
- d) The Contractor shall remain fully responsible for ensuring safety and in case of any accident, shall of all damages to this equipment and new and also damages to Railway & its passengers.
- e) The Contractor shall also bound by the provisions of this agreement to ply the road Vehicles only with adequate margin of safety, well clear of the fixed structure profile of infringements, as stipulated in the rules made under the Indian Railways Act and to seek and be guided by the Signals and other directions of any look-out men or other personnel retained for the purpose of ensuring safety, and to ensure extra care and vigilance while turning, reversing or moving the road Vehicles Track or the siding as the case may be. The Contractor shall employ necessary look-out men also at his own cost, irrespective of any other arrangement that Railway may make in this regard.
- f) Any breach of these conditions by the Contractor and/or his agents affecting the safety of movement of Trains, engines, or other rolling stock of the Railway shall constitute a breach of Contract by the Contractor entailing liability for termination of contract for default on the part of the Contractor.
- g) When the work is required to be done along or near the existing Railway track the contractor/s shall take such steps as are necessary for the safety of the track and labour working at site. He/they will also be required to programme his/their working so as not to interfere with the movement of trains. In this regard, contractor will not take up the track work on running lines without the presence of authorized representative of Railway. No extra payment shall be allowed for these precautions and also for crossing track/tracks, if required during the execution of the work. It should be ensured that the ballast of the track (s) is not spoiled or mixed with earth.
- h) In addition to the precaution by the contractor/s for the safety of the track and labour, it may necessary to post flagman in same locations as an additional safety measure, for which the cost shall be recoverable from the contractor/s on the basis of the expenditure incurred by the railways enhanced by 12½% department charges. The contractor/s shall be fully responsible for any damage to or trespass caused by his/their men to any surrounding structure, Railways bear no liability whatsoever on this account.

38. PROTECTION AND STEPS TO BE TAKEN IN ORDER TO AVOID DANGERS TO RAILWAY INSTALATIONS:

- a) At such of the locations where contractor/ road vehicle are permitted to ply adjacent to the running lines and yard, an experienced gang-man shall be deputed as flagman at the cost of the contractor to prevent accidents. This factor should be borne in mind by the contractor/s while formulating the rates.
- b) If the work to be executed is in proximity or the running railway track, the contractor will be required to be followed all precautions and carry out all works that may be necessary to ensure the safety of the running track/trains, without imposition of any speed restriction thereon as may be directed by the engineer or his authorized representative. No claim whatsoever will be entertained for either an inconvenience caused to the contractor or for the rescheduling of the operations or for any other reasons on this account.
- c) The contractor shall take all precautionary measures in order to ensure protection of his own personnel moving about or working on the railway premises and shall have to conform to the rules and regulations of North Central Railway. If any unforeseen accident or injury happens while on working, the contractor shall be solely responsible for the same.
- d) Within the station premises, especially on passenger platforms, or near the running track, contractor/s shall ensure sufficient free space for movement of passenger traffic. He must cover and protect the excavation carried out in such areas with a view to avoid the accident. The works must be carried out most carefully in such a way that they do not hinder the railway operation except as agreed to by the railway. The contractor's employee and workers shall not for any reason operate any appliances or installation of the railway concerning the safety of the train's movements, but they should whenever necessary notify to the qualified railway staff who will then take necessary steps.
- e) The contractors shall see that no change in caused to railway signalling and transmission wire, stations, installation, communication lines, electric devices, trains of any kind, fencing as well as any rolling stock and in general to all railway installation and equipment in case any damage is caused to these due to the fault of the contractor on the part of anyone on his behalf all repairs there required will be carried out by the railway at the entire cost of the contractor and amount of expenses thus incurred will be recovered from the payment due to him.
- f) The contractor shall be responsible for safe custody of tools and of the safety of his labour. He should ensure that labour on work removes their tools clear of the tracks on the approach of any trains. After the day work, the contractor should ensure that the tools are deposited proper tool box before the labour proceeds for their homes. Tool issued should not be allowed to fall in and unwanted hand who can tamper with the railway track.
- g) The contractor shall employ one suitable supervisor to supervise the work at site. Though all the work relating to the safety of running trains shall be executed under railway supervisor and the presence of qualified supervisor from the contractor's site is a must at the site of work. Contractor shall provide 150mm thick white line with lime at a distance of 3.5m from centre to existing track. This while line shall be in the entire length where work is going on and/or the vehicle/machinery are plying along the track. Nothing extra shall be paid for this.
- h) Barricading with the help of portable fencing shall be provided in the length where the day's work is to be done in close vicinity of the track. The fencing shall consist of self-supporting steel column connected with at least 20mm thick red nylon rope/red colour strips. The column shall be of 1.2m height. This will be placed at a distance of 3.5m from centre line of the nearest track. Nothing extra shall be paid for this work unless

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- otherwise payable.
- i) Asstt. Officer/Sr. Scale officer shall issue competency certificate after checking license and their working to all drivers of nominated vehicles/machinery. Inspector at site shall ensure that the driver who does not possess the competency certificate will not work at site.
 - j) The area between running line and white line shall not be permitted to become slushy and adequate drainage must be ensured at all times.
 - k) Machine/vehicle shall ply 6m clear of track and movement /work at less than 6m and up to 3.5m of clear track centre shall be done in the presence of the railway employee authorized by the Engineer in- charge. The railway employee so deputed shall ensure safety of the track, with banner flag, hand signal lamps and detonators.
 - l) If vehicle/machinery/materials are to come within 3.5m of existing track, work must be done under the presence of an inspector authorised to do safety works. A caution order shall be issued and track will be protected with the banner flag, hand signal lamps and detonators.
 - m) Normally, night working shall be avoided. A night working shall be permitted by AEN/SEN in writing. One inspector shall be specifically deputed to supervise the night working. The site/area where night working is to be done shall be adequately lit. Nothing extra shall be paid for this.

39. PENALTIES DUE TO UNSAFEWORK:

- a) In the event of accident at the work site, a departmental enquiry shall be held and increase it is established that the accident has occurred on account of contractor's negligence or the negligence of his men, penalties up to an upper limit of 10% of the total cost of the work shall be imposed on the contractor.
- b) Railway administration reserves the right to terminate the contract with immediate effect in the contractor is found responsible for causing an accident without giving any further notice/notices to the contractor.
- c) In the event of contractor not completing the work or leaving it unsafe at the end of days' work so they may serve speed restrictions if required to be imposed, track shall be attended to by the railway immediately at the contractor's cost without any further notice. In addition the labour cost recoverable from the contractor, supervision charges @ 12.50% and train detention charges @ Rs.2000/- every half hour or part thereof shall also be recovered.
- d) In the event of contractor starting the job without proper supervision causing an accident, he may be prosecuted under railway act for lawfully interfering with the railway track in addition to the recovery of Rs. 20000/- or value of actual loss, whichever is less as penalty.

40. FLAGMEN At such of the locations where contractor/s road vehicles are permitted to ply adjacent to the running lines and yard, an experienced gang man shall be deputed as flagman at the cost of the contractor to prevent accidents. This factor should be borne in mind by the contractor/s while formulating the rates.

41. In case of any disputes regarding interpretation of any of the above clause, decision of the BBJ shall be final and binding on the contractor/s.

42. Safety Precautions to be Taken While Permitting Plying of Vehicles in the vicinity of working site: Safe working of contractors (Extract of Para 826 of IRPWM):-A large number of men and machinery are deployed by the contractors for track renewals, gauge conversions, doublings, bridge rebuilding etc. It is therefore essential that adequate safety measures are taken for the safety of the trains as well as the work force. The following measures should

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invariably be adopted:

- (i) The contractor shall not start any work without the presence of BBJ/ railway supervisor at site.
- (ii) Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the Railway's schedule of dimensions. For this purpose, the area where road vehicles and/or machinery are required to ply, shall be demarcated and acknowledged by the contractor. Special care shall be taken for turning/ reversal of road vehicles/machinery without infringing the running track. Barricading shall be provided wherever justified and feasible as per site conditions.
- (iii) The look out and whistle caution orders shall be issued to the trains and speed restrictions imposed where considered necessary. Suitable flagmen/detonators shall be provided where necessary for protection of trains.
- (iv) The supervisor/workmen should be counselled about safety measures. A competency certificate to the contractor's supervisor as per Proforma shall be issued by AXEN/XEN, which will be valid only for the work for which it has been issued.
- (v) The unloaded ballast/rails/sleepers/other P-Way materials after unloading along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.
- (vi) Supplementary site-specific instructions, wherever considered necessary shall be issued by the Engineer in Charge.
- (vii) There shall be an assurance register kept at each site, which will have to be signed by both, i.e. Railway Supervisor or his representative as well as the contractor's supervisor as a token of their having understood the safety precautions to be observed at site.

- 43. PLYING OF ROAD VEHICLES AND WORKING OF MACHINERIES CLOSE TO RUNNING TRACKS:**
- (i) Normally, the road vehicles shall be run or machinery shall be worked so as not to come closer than 6.0m from centre line of nearest running track.
 - (ii) The land strip adjacent to running tracks, where road vehicle is to ply or machinery is to work, shall be demarcated by lime in advance in consultation with the Railway's Supervisor. Wooden pegs at interval not exceeding 75mts shall be provided along the line marking as permanent marks. The road vehicles shall ply or machinery shall work so as not to infringe the line of demarcation.
 - (iii) If a road vehicle or machinery is to work closer to 6.0m due to site conditions or requirement of work, following precautions shall be observed.
 - a. In no case the road vehicle shall run or machinery shall work at distance less than 3.5m from centreline of track.
 - b. Demarcation of land shall be done by bright coloured ribbon/nylon cord suspended on 75cm high wooden/bamboo posts at distance of 3.5 m from centre line of nearest running track.
 - c. Presence of an authorized Railway's representative shall be ensured before plying of vehicle or working of machinery.
 - d. Railway's Supervisor shall issue suitable caution order to Drivers of approaching train about road vehicles plying or machineries working close to running tracks. The train drivers shall be advised to whistle freely to warn about the approaching train. Whistle boards shall be provided wherever considered necessary.
 - e. Lookout men shall be posted along the track at a distance of 800m from such locations who will carry red flag and whistles to warn the road vehicle/machinery users about the approaching trains.
 - f. On curves where visibility is poor, additional lookout men shall be posted.
 - g. If work is required to be executed in night hours than adequate lighting

- arrangements including all safety measures to be ensured while working in vicinity of running lines.
- (iv) If vehicle/machinery is to be worked closer to 3.5m from running track. Under unavoidable conditions, if road vehicles is to ply or machinery is to work closer to 3.5m due to site conditions or requirement of work, following precautions shall be observed:
- a. Plying of vehicles or working of machinery closer to 3.5m of running track shall be done only under protection of track. Traffic block shall be imposed wherever considered necessary. The site shall be protected as per provisions of Para No. 806 & 807 of P-Way Manual as case may be.
 - b. Presence of a BBJ/ Railway's Supervisor shall be ensured at worksite.
 - c. Railway's Supervisor shall issue suitable caution order to Drivers of approaching train about vehicles plying or machineries working close to running tracks. The train drivers shall be advised to whistle freely to warn about the approaching train.
- (v) Precaution to be taken while reversing road vehicle alongside the track. The location where vehicle will take a turn shall be demarcated duly approved by BBJ/ Railway's representative. The road vehicle driver shall always face the Railway track during the course of turning/reversing his vehicle. The presence of an authorized Railway representative shall be ensured at such location.
- (vi) Road vehicle shall not be allowed to run along the track during night hours generally. In unavoidable situations, however, vehicles shall be allowed to work during night hours only in the presence of an authorized Railway's representative and where adequate lighting arrangements are made and where adequate precautions as mentioned earlier have been ensured.
- (vii) Road vehicles/machinery/plant etc. when stabled near running tracks shall be properly secured against any possible roll off and always be manned even during off hours.

44. EXECUTION OF WORKS CLOSE TO OR ON RUNNING LINES:

- (i) Any work close to or on running tracks shall be executed under the presence of a Railway's Supervisor only.
- (ii) Precaution to be taken to ensure safety of trains while execution of work close to the running line or on running lines.
 - a. Such works shall be planned and necessary drawings particularly with regard to infringement to moving dimensions shall be finalized duly approved by competent authority before execution of work. The work shall be executed only as per approved procedure and drawings.
 - b. All temporary arrangements required to be made during execution of work shall be made in such a manner that moving dimensions do not infringe.
 - c. Suitable speed restriction shall be imposed, or Traffic block shall be ensured as required.
 - d. The site shall be protected as per provisions of Para No. 806 & 807 of Indian Railway P-Way Manual as case maybe e. Necessary equipment for safety of trains during emergency shall be kept ready at site.
- (iii) Precaution to be taken to ensure safety of electrical/signal/ telephone cables while excavating near tracks.
 - a. Particular care shall be taken to mark the locations of buried electrical/signal/telephone cables on the plans jointly with S & T/Electric supervisor and also at site so that these are not damaged during excavation.
 - b. Copy of the cable plan should be given to the contractor's authorized representative before handing over the site to start the work.
 - c. Due care shall be taken to ensure that any part of the equipment or machinery or temporary arrangement does not come close to cables while working.

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- NOTE- To safeguard the underground cables (signaling, telecommunication and electrical cables) care should be taken during execution of work in accordance with as per Railway Board's JPO circulated vide letter S&T/NCR/JPO/CABLE dated 18.01.2016 and accordingly in case of damage to the cables action will be taken.
- (iv) Precaution to be taken during execution of works requiring traffic blocks.
- Any work which infringes the moving dimensions shall be started only after the traffic block has been imposed.
 - Before closing the work, the track shall be left with the proper track geometry so that the trains run safely.
 - After completion of work the released sleeper and fittings should be properly stacked away from the track to be kept clear of moving dimensions.
 - Block shall be removed only when all the temporary arrangement, machineries, tools, plants have been kept clear of moving dimensions.
- (v) Precaution to be taken during execution of works during night. The work close to the running line, generally, shall be carried out only during day hours. At locations, however, where night working is unavoidable, proper lighting arrangement should be made. The engineering indicator boards shall be lighted during night hours as per the provisions of IRPWM. The staff deputed for night working should have taken adequate rest Before deploying the mid night shift. We can specify the duration of night shift from 20.00hrs to 04.00 hrs. All other safety precautions applicable for day time work should be strictly observed during night working.
- (vi) Precautions to be taken to ensure the safety of workers while working close to running lines.
- Necessary lookout men with red flags and whistles shall be provided to warn the workmen about the approaching train.
 - BBJ/ Railway's supervisor shall issue suitable caution order to Drivers of approaching train for whistling to warn the workers about the approaching train. Whistle boards shall be provided wherever considered necessary.
 - A "First aid kit" shall always be kept ready at site.
- (vii) Precaution shall be taken for safety of public or passengers, while executing works at locations, used by passengers and public. The worksite shall be suitably demarcated to keep the public and passengers away from work area. Necessary signage boards such as "Work in progress Inconvenience is regretted" etc. shall be provided at appropriate locations to warn the public/ passengers. Adequate lighting arrangement of worksite wherever required shall be done to ensure safety of public/passengers during night.
- (viii) Precaution to be taken before stacking materials alongside the track to ensure that safety of trains is not affected. The following precautions shall be taken before stacking the materials along the track for stacking of ballast, rails, sleepers etc.
- The sites for material stacking should be selected in advance in such a manner as to ensure that no part of the material to be stacked is infringing the Standard Moving Dimensions. A plan of proposed stacking locations be made and signed jointly by an authorized Railway's representative and contractor's representative.
 - The selected locations shall be marked by lime in advance.
 - Presence of an authorized Railway's representative while unloading and stacking shall be ensured.
 - The material shall be stacked in such a height so as to not to infringe SOD in case of accidental roll off. In addition, instructions issued through various PCE/Rly circulars with all amendments regarding barricading, protection of running lines while working in vicinity of it should be strictly followed. For safety PCE Circular no 103 R issued on 20.11.19 by NCR should be followed

45. PROTECTION OF TRACK DURING EMERGENCY:

- (i) Action to be taken when a contractor's supervisor or vehicle operator apprehends any unusual circumstances likely to infringe the track and endanger the safe running of trains. At any time if a contractor's supervisor or vehicle operator observes any unusual circumstances likely to infringe the track and apprehend danger to safe running of track, he shall take immediate steps to advise a Railway official of such danger and assist him in protection of track. The track shall be protected as under: - One person shall immediately plant a red flag (red lamp during night) at the spot and proceed with all haste in the direction of approaching train with a red flag in hand (red lamp during night) and plant a detonator on rail at a distance of 600m from the place of obstruction of BG track (400m for MG track) after which he shall further proceed for not less than 1200m from the place of obstruction from BG track (800m for MG track) and plant three detonators at 10m apart on rails. After this he shall display the red flag (red lamp during night) at a distance of 45m from the detonators. Attempts shall also be made to send an advice to nearest Railway station about the incident immediately.
- (ii) Action to be taken if train is seen approaching to site of danger and there is no time to protect the track as per guidelines mentioned above. In such a case the detonators shall be planted on rails immediately at distance away from place of danger as far as possible and attention of driver of approaching train shall be invited by whistling, waving the red flag vigorously, gesticulating and shouting.
- (iii) Action shall be taken if more than one track is obstructed:
 - a. In case of single line protection as above shall be done in both the directions from place of danger.
 - b. In case of double line or multiple lines, if other tracks are also obstructed, the protection as above shall be done for other track also. The protection shall be done in that direction and on that track first on which train is likely to arrive first.
 - c. The Contractor's Supervisors, Operators and lookout men shall be properly explained about the direction of trains on running tracks.
- (iv) Equipment required for protection of track. The minimum compliment of protection equipment i.e. 10 detonators, 4 red hand flags, 4 red hand lamps, 4 banner flags and whistles etc. shall always be kept ready at worksites for use in case of emergency. Railway will arrange to provide detonators, whereas Contractor shall arrange other equipment at his own cost. Arrangement of lookout men and competency required for lookout man to warn labour about approaching train.
 - a. Contractor will provide lookout men.
 - b. The lookout men shall be properly trained in warning to staff at worksite about approaching train.
 - c. Only those lookout men shall be provided at site who have been issued with a competency certificate by the Railway's Supervisor.
 - d. In case, it is felt necessary to provide lookout men by Railway, the charges for the same as fixed by Railway Administration shall be recovered from Contractor.

- 46.** Special conditions for the working of cranes and hoisting arrangements: (Ref: RB LNo. 2015/CE-IV/RUB/206 dated 15.02.2016 & 11.08.2016) To ensure safe working of cranes/hoisting arrangements used in works, following items shall invariable be ensured before putting these arrangements to use:
- (a) No machine shall be selected to do any lifting on a specific job until its size and characteristics are considered against the weights, dimensions and lift radii of the heaviest and largest loads.
 - (b) Based on site conditions i.e. maximum boom length and operating radius, safe working load of crane shall be assessed which should be more than 1.5 times of load to be handled.

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- (c) Before actually commencing the work near track, trial at site shall be done by actually lifting the heaviest segment to be tackled with required boom length and required operating radius. Once, the trial is successful, then only crane shall be brought to site of actual work.
 - (d) The stability of slope under imposed load of crane prop under worst loading conditions and point nearest to edge of slope shall be checked. The location of prop, location of working of crane and other relevant factors shall be clearly indicated on plan.
 - (e) At locations near crane propping, the strengthening of slope by driving the rails/ salballi piling shall be done to prevent any chance of slope failure. Also, the proper compaction/strengthening of soil at prop location shall be done to prevent any settlement of prop.
 - (f) Stone/quarry dust may be filled by side of precast units with hand compaction before resorting train.
 - (g) The contractor shall ensure that a valid Certificate of Fitness is available before use of Road Cranes.
 - (h) Contractors should utilize the services of any competent person as defined in the Factories Act, 1948 and approved by Chief Inspector of Factories.
 - (i) The laminated photocopies of fitness certificate issued by competent persons, the operators' photo, manufacturer's load chart and competency certificate shall always be either kept in the operator cabin or pasted on the visible surface of the lifting appliances.
 - (j) All lifting appliances including all parts and gears thereof, whether fixed or movable shall be thoroughly tested and examined by a competent person once at least in every six months or after it has undergone any alterations or repairs liable to affect its strength or stability.
- 47.** Emergency works: In the event of any accident or failure occurring in, on or about the work or arising out of or in connection with the construction, completion or maintenance of the works, which in the opinion of the Engineer requires immediate attention, the Railway may bring its own workmen or other Bidder to execute or partly execute the necessary work or carry out repairs if the Engineer considers that the contractor/s is/are not in a position to do so in time and charge the cost thereof, which will be determined by the BBJ/ Railway, to the contractor.
- 48.** Vehicle and equipment of the contractor can be drafted by BBJ/ Railway Administration in case of accidents/natural calamities involving human lives. For payment purposes, the item may be operated as new non-schedule item (NS Item) as per existing norms and powers delegated.
- 49.** Contractor shall provide suitable manpower to Engineer in-charge or his representative at all times during currency of the contract for assisting him in giving layout of work, carrying out quality checks, taking measurements and other associated activities for effective supervision of work.
- 50.** Work prepared away from the site: The contractor shall give the Engineer written notice of the preparation or manufacture at a place away from site, of any materials or components to be used on the works, stating the place & time of preparation or manufacture, so that the Engineer may inspect all stages of the production process. Failure to give such notice may result in the rejection of the materials or components. Facilities for the inspection of such work shall be provided by the contractor.

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ADDITIONAL SPECIAL CONDITIONS & SPECIFICATIONS (PART- II)

1. FIELD LABORATORY:

The contractor shall be required to provide a site laboratory with adequate space for equipment for carrying out testing aggregates, water, cement, sand, and testing of concrete for compressive strength and workability, sieve analysis of aggregates, soil and blanketing materials. OMC and MDD of Earthwork and other parameters. Contractors shall deploy in site laboratory facilities such as computer, communication etc. for analysis of test results, reviewing and reporting of progress of work. The lab should be manned, managed & maintained by suitable, qualified personnel from the contractor. Field laboratory shall preferably be located adjacent to the site office of the Engineer and provided with amenities like water supply, uninterrupted electric supply etc. The laboratory should be at least 4.5mx4.5 m in size to have space for the installation of equipment, laboratory tables and cupboards, working space for carrying out various laboratory tests and a curing tank for the curing of samples.

2. Laboratory Equipment:

The following items of laboratory equipment duly calibrated shall be provided in the field laboratory:

1	Balance 20 kg capacity self-indicating type
2	Electronic Balance 5 kg capacity accuracy 0.5 gm
3	Electric hot plate
4	Glassware's, spatulas, wire gauzes, steel scales, measuring tape, casseroles, karahis, enameled trays of assorted sizes, pestle-mortar, porcelain dishes, gunny bags, plastic bags, chemicals, digging tools like pickaxes, shovels etc.
5	Set of IS sieves with lid and pan 20mm, 19mm, 10mm, 4.75mm, 2 mm 600mic, 425mic, 212mic, 75mic
6	Water testing kit
7	Soil test equipment's
i	Core cutter with dolly
ii	sand replacement equipment
iii	Liquid Limit apparatus & Shrinkage limit apparatus
iv	Stainless steel spatula - 25cm long
v	Frying pans
vi	Stove janta
vii	Straight edge 300mm long
viii	Desiccators as per IS -6128
ix	Specific gravity test apparatus.
x	Thermostat Oven to maintain a temperature
xi	Sodium carbonate
xii	Hammer
xiii	Rapid Moisture meter or kit for determination of moisture content
xiv	CBR testing machine.
8	First aid box
9.	For aggregates
i)	Flakiness and Elongation Test Gauges. (ii) Sieve sets
10.	For cement and cement concrete
i)	Vicat apparatus for testing setting times
ii)	Slump testing apparatus
iii)	Compression testing machine
iv)	Needle Vibrator

Note: The items and their numbers listed above shall be finally decided by the Railways Engineer as per requirements of the Project and modified accordingly 3.

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3. RECORDS AND REGISTERS:

The contractor shall maintain accurate records, plans and charts showing the details and progress of the main operation and Engineer shall have access to this information at all reasonable times. The following registers will be maintained at site by the Engineer-in-charge, which will be signed by representative of the Engineer and the contractors:

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- i) Site Order Register
- ii) Cement Register
- iii) Steel Register
- iv) Labour Register
- v) Plant & Machinery Register
- vi) Measurement Register
- vii) Material Testing Register
- viii) Material Passing register
- ix) Daily progress register
- x) Cube Testing Register
- xi) Mix Design Register
- xii) Check Request Register

4. SAMPLING & TESTING:

Various tests with their frequency have been mandated in IRUSS, CPWD Specification, IRS Codes, BIS Codes etc.

Contractor shall establish a field laboratory-cum-site office at site of work at his own cost. This field laboratory must be equipped with calibrated test equipment's for tests on soil, aggregate, concrete and its components, blanket material, earthwork etc., survey equipment's like TS, levels and keep a minimum set of staff to man this lab to carry out the number of tests required as per specifications for quantum of works as per agreed work plan. He shall ensure that the equipment provided are of latest specification and are in good working order and got calibrated from authorized firm. Contractors shall also provide facilities such as a computer, communication etc. for analysis of test results, reviewing and reporting of progress of work. He will provide full assistance to Engineer or Engineer's Representative for testing in field lab. Cost of recurrent calibration, repair, maintenance of these equipment will be borne by contractor. The contractor shall get certain percentage of samples tested at other approved laboratories/colleges as may be directed by the Engineer-in-charge as confirmatory tests at his own cost. Contractor will arrange to send samples to external testing laboratory and collecting test reports. Tests which cannot be conducted at contractor's laboratory at site, will be conducted at approved colleges/laboratories as mentioned in these conditions. Complete cost of testing will be borne by contractor. In exceptional circumstances, BBJ may allow, on request of contractor, to get some tests executed from approved laboratories/colleges, till the laboratory is setup or if the equipment goes out of order, in the interest of work. However, this should be an exception instead of the norm, with an intent only to not allow progress of work to suffer. Rate of all SOR/NS items is deemed to have been included cost of all testing to be performed as per IRUSS/CPWD Specifications/IRS Codes/BIS Codes either in contractor's site laboratory or in approved outside laboratories/colleges, unless otherwise specified in item or Special Conditions of Contract.

5. LIST OF APPROVED LABORATORIES FOR TESTING OF ENGINEERING MATERIALS.

(AUTHORITY- CE/P&D/ALD's letter no.291-W/2/QC/Inspection dated 20.12.2013, 17.09.2015).

A list of approved laboratories for testing of materials is as under:

1. Moti Lal Nehru Regional Engineering College Allahabad
2. Institute of Engineering and Rural Technology, Allahabad.
3. CSP/N.C.Rly./Subedarganj, Allahabad.
4. IIT (BHU), Varanasi.
5. KNIT, Sultanpur.

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6. HBTI, Kanpur.
7. IIT, Kanpur.
8. Material Test Laboratory, Civil Engg. Deptt., AMU, Aligarh.
9. National Test House, Kamala Nehru Nagar, Gaziabad.
10. IIT, Delhi.
11. Delhi College of Engineering, Delhi.
12. Sri Ram Test House, Delhi.
13. Dayalbagh Engineering College, Agra.
14. Madhav Institute of Technology, Gwalior.
15. Bundelkhand Institute of Technology, Jhansi.
16. Forest Research Institute, Dehradun (For wood work)
17. Any NABL approved laboratories. For any addition /deletion in the above list, approval of HQ (CE/P&D) has to be obtained. Contractor is free to get the material tested from any of the above laboratories, with prior approval of Engineer's representative which will be final. For specific specialized items, tests not being done in above laboratories, decision will be taken by Dy.CE/C, on reference from contractor.

6. The contractors will be fully responsible for the safeguard of the construction material brought at site like cement, steel, aggregate, bricks, T&P etc. BBJ will not compensate for any damage, loss or theft of such material from site.
7. If in the opinion of the Engineer, equipment's/plants/T&P brought by the contractor are not suitable for the work concerned, the Engineer shall have the right to order the contractor to replace them by suitable equipment's/plants/T&P. In the interest of public convenience, Engineer may insist on a specific way of execution of the work.
8. The contractor will procure and use materials from IS (BIS) approved firms. Independent tests should also be conducted to ensure that the materials conform to IS (BIS) specifications. This will be done as built-in method statements and will be in accordance with relevant codes.
9. To ensure quality control, test certificates from the manufactures should be produced by the contractors, which should confirm to the relevant specifications/ codal provisions.
10. In case of designed mixes of concrete, the contractor will submit the design of mix duly done by any approved Engineering Institute or Laboratory given in relevant clause in these conditions. Design of the mix will be carefully done from representative sample of aggregate and mix design calculations should be sent to the Engineer-in-charge for his approval. Unit weight of materials shall generally be as per IS-1911 and actual weight proposed to be adopted for designing shall be got approved by Engineer-in-charge.
11. The Tenderer/s will modify/carryout the mix design to the satisfaction of the Engineer, if so, required and get his final approval. Such approved design mix however, does not absolve the tender/s of his/their primary responsibility and obligation regarding the minimum strength to be obtained. Change in source of material will require redesign of concrete. Mix design shall be reviewed as per provisions of Concrete Bridge Code/IS 456 and IS 10262.
12. It may be noted that payment of excavation in foundation of bridges/ retaining wall will be made in accordance with a Good For Construction (GFC) drawing showing the authorized working space for works to be done from outside as specified in Clause 4.2.5 of IS 1200 (Part 1): 1992. This GFC drawing will be approved by BBJ/ Railway and the decision of BBJ will be final. Nothing extra will be payable to the contractor for additional extra width or

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slope beyond authorized working space, he/they may have to excavate for any reasons whatsoever during execution of work. Also, payment for any shoring etc., required, will be paid only as if found necessary and will be paid as shown in the approved GFC drawing.

- 13.** Contractor will provide Three (03) set of leading company's Computer with **configuration & all requisite accessories such as LCD monitor of 21", CPU (Intel I-9 processor, RAM 8GB, HDD-1TB, 1 TB Internal Solid State Drive (SSD), DVD writer), Optical Mouse, Multimedia Keyboard, UPS-750VA and Three (03) set of A4 black & white Laser Printer/ Scan/ Copier for Railway official use and its will become the property of the Railway. Nothing shall be paid on this account and no dispute /claim will be entertained on this account. If the contractor fails to provide the computers of above configuration with all requisite accessories, recovery will be done as per prevailing market rate.**
- 14.** **The contractor will provide well-furnished one site office of size 4mx6m made with Porta cabin for site supervision from date of actual commencement of work & up to physical completion of work for which no extra payment will be made for this.**
- 15.** The contractor shall provide, **one (01) no. Total station** instrument preferably **SOKKIA/TREMBLE** with required accessories for execution of work which will become property of Railway after completion of work for carrying out further maintenance works. Nothing extra shall be paid on this account and no dispute /claims will be entertained on this account. If the contractor fails to provide the above-mentioned instruments of suitable configuration with all requisite accessories as per satisfaction of Engineer-in-charge, the Rs. 10.0 lacs will be withheld from 1st on-A/C's bill which will be released after procurement of the same.
- 16. SPECIFICATIONS FOR CONCRETING:**
- Specifications given in this part shall apply to the construction of sub structure and super structure & shall be read in conjunction with Special conditions of contract.
 - Construction and concreting of sub structure shall conform to the requirements as laid down in Concrete Bridge Code updated to latest Correction slips and IS 456- 2000 and the requirements specified hereunder.
 - All concrete work shall be with controlled concrete satisfying the strength and quality requirements and other conditions specified in the codes and specifications mentioned in special specifications. The contractor is responsible for the design of concrete mix and getting it approved by the Engineer.
 - Mix design is required to be submitted twice at the beginning of each working season first in October and then in the February. Mix design shall also be reviewed in the event of change in source of cement, sand and aggregate or for any other reasons as and when so required by the Engineer, Contractor is required to carry out concreting work in all types of conditions, dry wet, above water level, below water level, requirement above ground level, below ground level, at all locations and heights as required for the work.
 - Design of concrete mix shall be in accordance with any of the methods given in the Indian Standard recommended guide lines for concrete mix design given in "Hand book of concrete mix design" issued by Bureau of Indian Standard.
 - Concreting in girders/Box /Slabs shall be organized in such a way that no end joints are poured during the course of concreting. Scheme for girders/ Box /slab concreting shall be submitted by contractor for approval of Engineer-incharge.
- 17. CEMENT:**
- 1) Cost: The cost of cement for the work is included/not included in the rates for Master

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- schedule items of IRUSSOR2021 mentioned in the tender as per notes/instructions given in IRUSSOR-2021. The cost of cement for the work is included/not included in the rates for NS items as mentioned in the relevant item.
- 2) BBJ will not supply any cement for the works. The contractor has/ have to procure the cement required for the work from the market and transport the same to the site of work at his/ their own cost including all taxes, octroi etc, and / including all lead and handling etc.
 - 3) Purchase: The cement should be purchased by the contractor only from the Authorized/ Approved manufacturers or their authorized agent. The contractor should produce the documented proofs such as bill Challan, etc, from such authorized manufactures/ Agents from whom the cement is purchased for every lot of cement brought at site and to be verified by the BBJ / Railway's representative. The cement brought at site without such documental proofs will not be permitted to be used in the works.
 - 4) Storage: The cement as approved by the BBJ/ Railway's representative will be properly stacked at site in the godown constructed by the contractor at his own cost. The contractors should keep the cement under their safe custody and will be made accessible to the BBJ/ Railway to the BBJ/ Railways' representative to physically verify and check at any time. The contractors will be fully responsible for the safeguard of the cement along with other materials and the BBJ will not compensate for any damage, loss or theft of the cement or any other materials at site.
 - 5) Any delay in procurement of cement will not be considered as cause for granting extension for the date of completion
 - 6) Quality and testing: The cement used shall be used with the prior approval of the Engineer in accordance with the Para 4.1 of Concrete Bridge Code
 - a) The cement should be net weight 50 Kg. In bags, cement bags should be preferably in paper bag/ polyphone bag packing and should bear the following information in legible markings.
 - i) Manufacture's Name.
 - ii. Registered Trade Mark of Manufacture, if any.
 - iii) Type of cement with ISI Code No.
 - iv) Weight of each bag in Kgs.
 - v) Date / Month of Manufacture with Year.
 - b) Random specimen samples of cement taken from the lot brought at site should be tested at any authorized / approved Engineering Institute/ reputed laboratory, for its physical and chemical properties as specified in the IS specifications (IS-4031) and any other tests as specified by the Engineer or his representative. Some of the tests which should be carried out are:-
 - i) Compressive Strength.
 - ii) Initial and final setting time.
 - iii) Consistency.
 - iv) Soundness: These tests will be got carried out by the BBJ/ Railway's Representative and the arrangements and cost of tests including cost of cement for testing will be borne by the contractor. Such tests should be done at times when it is found necessary at the discretion of the site Engineer/ his Representative at site.
 - c) To ensure quality control test certificates from the manufactures should be produced by the contractors, which should confirm to the relevant specification.
 - d) Rejected lot should be removed from the site immediately by the contractors.
 - 7) Consumption Use and Accountal:
 - a) The consumption or use of cement in the works will be at the rate of quantities specified for each item requiring nominal mix and as required for design mix.

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- b) In case of designed mixes of concrete, the contractors should submit the design of mix duly done by any approved Engineering Institute or Laboratory and the cement required as specified in the design should be used to achieve the specified strength of the concrete.
- c) Proper accounts of the cement for receipt, consumption balance etc. should be maintained at site duly verified and signed by the contractors and the BBJ and Railway Representative / Engineer. It is entirely contractor's responsibility to safeguard the cement from damage, loss and theft etc. and BBJ / railways will not pay any compensation for any such loss, damage or theft.
- d) In case, the cement consumed in the work is lesser than specified, the cost of such cement used less, will not be paid in the contractor's bill notwithstanding the fact that required strength is achieved by less quantity of cement used and also provided such works are qualitatively otherwise acceptable to the BBJ / Railways. In case of excess consumption, no extra cement will be paid to the contractor.
- e) The cement should be fresh and generally consumed within three months of its age. If the cement is older than three months, test should be carried out for its loss of strength and other properties and additional/ extra quantity of cement will be used, as decided by the site Engineer, to achieve the required strength. No extra payment will be made by the BBJ / Railway/ for such additional quantity used by the contractor.
- f) Cement brought at site by the contractor for a particular work should not be taken to other works/ site without the written approval/ permission of the BBJ / Railway's site Engineer.
- g) Any cement left out on completion of works will be the property of the contractor. The contractor will be at liberty to dispose off the left-over cement. BBJ/ Railway will neither take over the left-over cement nor will compensate the contractor in any manner whatsoever.

18. SPECIAL CONDITIONS FOR USING CONTRACTOR'S STEEL:

1. Cost: The cost of the steel will be paid under a separate suitable item as provided in the tender schedule. BBJ will not supply any steel for the works included in this tender.
2. Transport: HSD (TMT) steel bars of various dia. meters for reinforcement in RCC works and for other items of works as required, and structural steel for fabrication items of works, will be procured and transported to site by the contractor/s at his/their own cost.
3. Code: HSD (TMT) steel shall be used. The steel bars/ structural steel shall confirm to the relevant I.S. specifications. M.S. Bars should confirm to I.S. 432 (Part-I) 1982 and tor steel should confirm to I.S. 1786:2008 in standard lengths.
4. Storage: The steel brought at site should be properly stacked diameter wise separately and protected from contact with earth water etc. Wherever the treatment of the steel against corrosion is specified, the same should be done as specified in the items and specification. Steel supplied for reinforcement shall be kept free of loose mill scales, loose rust and coats of oil, mud or other material which may destroy or reduce bond till concreting.
5. Quality And Testing:
 - a) "All Reinforcement Steel (TMT Bars) and Structural Steel shall be procured as per specifications mentioned in BIS's documents-IS:1786 and IS:2062 respectively. Independent tests shall be conducted, wherever required to ensure that the material procured conform to the specifications.
 - b) These steel shall be procured only from those firms which are Established, Reliable, Indigenous & Primary Producers of Steel, having Integrated Steel Plants

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- (ISP) using Iron ore as the basis raw material and having in- house iron rolling facilities, followed by production of liquid steel and crude steel, as per Ministry of Steel's guidelines such as SAIL/TATA STEEL/RINL.
- d) However, only certain isolated sections of structural steel, not being rolled by ISP's can be procured from the authorized re-rollers of ISPs or authorized licensee of BIS having traceability system and who use billets produced by ISPs. Traceability shall be ensured by an officer specially authorized by the concerned SAG officer of the Zonal Railway on case-to-case basis for this purpose." (Authority RB L No. 2008/CE-I/CT/8 dated 01.05.2012 and NCR HQ letter No.278-W/CE/C/CTL/Steel dated 06.08.2018) Rejected material should be removed from the site by the contractor/s.
6. Consumption and Accountal:
- a) The steel should be used in the work as shown in the approved drawings. Overlaps, if necessary, should be provided as required by design & specification.
- b) Proper account will be maintained in the registers regarding consumption, balance etc. duly signed by the contractor/s, BBJ and Railway's representative.
- c) For the purpose of payment, linear measurement of reinforcement used for the work will be converted into mass/ unit weight. No rolling margin will be considered. The cut pieces, wastage and the left-out material will be disposed off by the contractor. BBJ will not pay any compensation for such cut pieces, wastage or balance left out material.
- d) The steel brought at site by the contractor for a particular work should not be shifted to other works/ site without the written approval/ permission of the BBJ's site Engineer.
- e) Welding of reinforcement will not be permitted except in special circumstances under the written approval of the Engineer.
- f) Every bar shall be inspected before assembling on the works and any defective, brittle, levelling rusted or burnt bars shall be removed. Cracked ends of bars shall be cut out.
7. Placing Supporting and Cleaning:
- a) Binding wire shall be used as approved by Engineer in charge. All frames crossing one another shall be bound with this wire twisted tight to make the skeleton on network rigid so that the reinforcement is not displaced during placing of concrete. All ends of binding wires shall be carefully turned inside so that they do not project out of concrete to cause starting of rusting action.
- b) Cleaning: Bars must be cleaned before concreting commences of all scale, rust or partially set concrete which may have been deposited there during placing of a previous lift of concrete.
- c) The bars shall be cleaned with dry gunny bags if they are coated lightly with rust or other impurities. On no account shall the bars be oiled or painted nor shall mould oil used on the formwork be allowed to come in contact with the bars. Cement wash to bars will not be permitted.
- d) Cover/Cover Blocks for reinforcement: The cover shall be uniform. Minimum clear cover shall be 50 mm or otherwise mentioned in the drawing. Suitable size of cover blocks of the same grade as that of concrete shall be cast in controlled conditions with binding wire fixed initially. All cover blocks shall be of cement and of the same strength as that of the surrounding concrete and properly compacted and vibrated on a vibrating table. They shall be cured for a minimum period of 21 days before they are used in the works.
- e) Placing and Spacing of reinforcement shall be according to drawings supplied by BBJ/ Railway. However, the spacing shall be sufficient to facilitate easy concreting and compaction. Proper detailing is essential as any cracking caused by defective

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detailing will cause Corrosion. All reinforcement shall be placed and maintained in the positions shown on the drawing. The Contractor shall provide approved types of supports as specified on the drawings for maintaining the top bars of the slab in position during concreting.

- f) Overlaps for main reinforcement of piles will be paid taking standard length as 6.0 meter keeping in view difficulty in placement of 12-meter standard lengths reinforcement bars due to OHE etc. For all other works standard lengths of 12 m only shall be considered for payment of overlap of main reinforcement until unless mentioned otherwise in the relevant items.

19. AGGREGATES

- 1) Only aggregate conforming to IS 383-1970 shall be used in concrete works whether it be plain or RCC. The provisions in IS-2386-1983 (Pt.-2) shall prevail when dealing with deleterious material and organic impurities.
- 2) Prior to deciding on the source for procurement of constituents of concrete, viz. Fine and coarse aggregate, the contractor shall specifically assess the soluble chloride any sulphate contents of fine and coarse aggregates (at source) and their permissible limits shall be got approved by BBJ / Railway, Regular checks as directed, shall also be carried out not only at the source of supply (of such materials) but also prior to their use in the permanent works to ensure that the aggregate do not contain impurities exceeding the permissible limits.
- 3) The special requirements to be satisfied are as under:

		Fine (Upper limits)	Coarse (Upper limits)
1	Chloride content (Cl.) Max	0.04 % by wt.(Acid soluble)	0.02 % by wt. (Acid soluble)
2	Sulphate (SO ₃)- Max	0.04 % by Wt. (Acid Soluble)	0.4 % by Wt.
3	Potential alkali reactivity	Absent	Absent
4	Water absorption- Max	3 % by wt.	3 % by wt.
5	Particle shape Mix	Shape Index 53% or Angularity N0.9	Flake-ness index/ Elongation index should not beyond 25%.
6	Mica-Maximum	1%	-
7	Silt-contents	3 % by weight	-
8	Soundness with Na ₂ SO ₄	10% Max 15 % maxi	-
9	Particles less than 75micron - Max.	3 % by wt.	1 % by wt.

- 4) The other requirement as regard to the overall limits of harmful salts contents, physical properties of aggregates, deleterious substances in aggregate and concrete etc. shall conform to the requirements of IS-2386(Part –I & II)-1963.
- 5) However, the final decision of acceptance criterion /rejection for aggregate to be used for permanent works shall lie with BBJ / Railways.

20. WATER

Water used for mixing and curing shall be clean and free from injurious amount of oils, acids, alkalis, salt, sugar, organic, material or other substances that may be deleterious to concrete or steel. Potable water is generally considers satisfactory for mixing and curing of concrete.

- 1) The water to be used for these purpose should be conforming to clause 5.4 of IS- 456. 2000. The permissible limits of solids in water tested as per IS.-3025 are given below:

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Sr.No.	Type of Solid	Permissible Limits
1.	Organic	200 Mg per Litre
2.	In Organic	3000 Mg. Per Litre
3.	Sulphate(as SO ₃)	400 Mg. Per litre
4.	Chlorides(as Cl)	2000Mgperliterforconcretenotcontaining embedded steel & 50 Mg per Litres reinforced concrete work
5.	Suspended matter	2000 mg. Per Litres.

21. ADDITIVES/ADMIXTURES

If contractor desires to use any additives/ admixtures from the consideration of strength and workability, it should be in accordance with Para No. 4.4 of IRS Bridge Code Of Practice For Plain, Reinforced And Prestressed Concrete for General Bridge construction and extra cost of such additives/ admixtures will be borne by the contractor and for which no extra payment will be admissible.

22. FORM WORK AND FALSE WORK:

- 1) Form work and false work are very important for all concrete structures in question for these have influence on strength and durability of the structures. For this reason form work must be correctly designed and installed. The design of the form work shall take in to account the required surface conditions also (appearance compatibility with the required finish). This form work and false work together must provide safe working conditions. Safe access must be provided using additional scaffolding as necessary.
- 2) Design: The choice of formwork and false work structure is very important, the majority of defects and accidents are attributable to structural deficiencies of form work. The strength and stability of formwork, false work shall be designed for the loads which they are liable to experience in service by method appropriate to their constituent materials. The design shall be checked by calculation, testing, application of accepted rules, and must be carried out by competent personnel. Formwork shall be so designed that it can be correctly removed without damage to the concrete. Consideration should be given.
 1. To the stresses due to the weight of the concrete and due to any imposed loads.
 2. To the striking operations.
 3. To environmental conditions. The loads and pressure to which form works and false works are exposed originate mainly form the weight of concrete (specially the horizontal thrust component of fresh concrete) the weight of the form work itself, the laying and fixing of reinforcement, load transfer on prestressing and as a result of wind, heat fluctuations, ground settlement etc. & therefore, it shall be properly considered in design of form work.
- 3) The deformations of work shall be compatible with the tolerance required of the structure and shall not adversely affect its behaviour. Stiffening arrangements shall be provided as per design requirements.
- 4) Compatibility With Concreting Operation:
 - a) Formwork and false work shall be compatible with the method of placing and Vibration envisaged, with the requirements and with the curing scheduled for the concrete.
 - b) For vibration through the form work, excessive energy losses through the support (Plastic suspension of the shuttering) should be avoided.
- 5) Tightening Of Formwork
 - a) The form work shall be designed to prevent loss of material during concreting, particular care must be exercised to ensure the grout tightness of the joints between panels of the sheeting and between it and hardened concrete.

- b) Joints can be made grout-tight by ensuring proper contact between the edges of the panels, the shape of which may have been specially designed. In some cases joint will need to be sealed with compressible gaskets or tapes.
- 6) Fixing the forms
 - a. Where devices for holding the form work in place pass through the concrete these shall not affect the concrete.
 - b. Ties and spacers left in-situ shall not impair either the durability or the appearance of the structure (For instance by leaving traces of rust or as a passage for water).
- 7) Erection Supports: Foundation, false work and form work shall be positioned by skilled personnel in accordance with plans and specifications.
- 8) Assembling False And Formwork: Particular attention must be paid to the making of structural joint, transmission of loads, structures equilibrium and resistance to bucking and subway.
- 9) Tolerances: Formwork shall be so constructed that the finished concrete is within the required tolerances. Cumulative tolerances shall be considered as well as tolerances on single member
- 10) Preparing The Form Work faces: The sheeting surface intended to come in contact with freshly made concrete shall be clean. Approved releasing Agent shall be applied in thin uniform layer and the concrete should be placed soon enough after this to prevent loss of its effectiveness

23. CONTROL OF FORMWORK:

- a) Indicator should be installed at critical points to detect excessive deflection of the form work.
- b) Forms should be anchored to the props below so that up or lateral movement of any part of the forms will be prevented.
- c) Where there is a possibility of movement, means of adjustment (welded or jacks) should be provided to permit realignment or readjustment of props.
- d) Where the form work is trafficked by operatives or equipment, traffic should neither cause significant deflection nor bear directly on reinforcing steel.
- e) During and after concreting, but before stiffening of the concrete, form work systems should be checked for position. Appropriate adjustments should be made promptly where necessary. If during concreting, any weakness develops or Form work shows any undue settlement or distribution, the work shall be stopped and remedial action taken. Form work shall be continuously watched so that any corrective measures found necessary may be taken always work to be done under safe conditions and have a method of communication with concrete placing crews in case of emergency.
- f) Striking time: Forms should be retained in place until the concrete has hardened sufficient to withstand, without damage, the stresses imposed
- g) Striking Methods: Form work shall be struck, when the concrete is sufficiently hard, in accordance with the stages of construction as planned as without impact loading.
- h) Stability: Removal of the shoring supports should take into account of the time needed for adequate hardening for the concrete the support and of that on which they rest Retention of certain shoring elements may also be dictated by the general stability of the structure (wind-bracing).

24. MIXING:

Mixing shall conform to the requirements in Clause 9.3 and 9.3.1 of IS 456-2000.

25. COMPACTION OF CONCRETE:

- 1) Power vibrators including surface vibrator and form vibrator shall be used for

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compacting concrete.

- 2) All concrete members shall be compacted by vibration; generally internal vibrators shall be used on all sections that are sufficiently large to admit them.
- 3) Vibrator shall have operating frequency of at-least 3600 impulses per minute. Higher frequencies up to twice the minimum are preferred.
- 4) The following techniques shall be followed for vibrations.
 - i) Vibrators shall be distributed so that the concrete becomes a uniformly dense and plastic mass.
 - ii) Vibrators shall be used for compaction only and not for moving concrete.
 - iii) For horizontal and vertical operations of vibrators, the spacing of points of vibration shall be such that the zones of influence overlap.
 - iv) For concrete deposited in layers the vibrators shall be inserted vertically and allowed to sink due to its own weight to the bottom of the layer and be slowly withdrawn. For succeeding layer, the vibrator shall penetrate the surface of the previous layer.
 - v) Compaction shall be according to clause 12.3 of IS.456-2000.

26. CURING:

- 1) Special attention shall be given to curing of concrete in order to ensure maximum Durability and to minimize cracking.
- 2) Concrete surface shall be kept continuously wet for a period of at least 15 days. Rapid lowering of concrete temperature, which may result in thermal shock, shall be avoided. Contractor will make all arrangement for curing of fresh concrete as per instructions in IS: 456-2000 or Concrete Bridge Code as applicable. If during inspections, it is found that curing is not being ensured, entry will be made in Site Order Book and penalty of Rs. 5000/- will be imposed for each incidence. Decision of Engineer will be final in this regard.
- 3) All concrete work/RCC work/Brick work in cement mortar plaster/pointing etc. shall be continuously cured for the prescribed period as per direction of the Engineer
- 4) Curing shall be done by covering the newly laid concrete with gunny bags and keeping them wet constantly.
- 5) Contractor will also have to, arrange for curing by approved curing compounds, steam curing in certain cases during the progress of work as directed by the Engineer-in-charge. The rates shall include the cost of all such arrangements.
- 6) In case BBJ / Railways representative is not satisfied with the arrangements and is of the opinion that an effective robust system of water curing is not in place and rectification in line with curing related instructions are not being followed or adequate water-based curing is not feasible due to any reason, he may:
 - a. All the concrete cube test cubes to also be placed on the structure at suitable location as decided by the BBJ/ Railways, being cured and not in a curing tank, to closely simulate the actual curing being obtained.
 - b. Require the contractor to adopt membrane curing (curing compounds) and / or
 - c. Require additional confirmatory tests for concrete strength finally obtained by taking out cores or suitable nondestructive tests.
 - d. Decision of BBJ / Railways will be final in this matter and no extra payment will be made.

Even after repeated imposition of penalty contractor does not carry out curing in proper manner, Engineer may stop the work till rectification is made or undertake the curing through another Bidder/labour without any notice to the contractor at the cost of the contractor. The cost incurred along with 2% incidental charges and supervision charges @ 12 ½% of the cost will be debited to the contractor.

Intimation of the employment of another Bidder for curing will be given to the contractor as soon as possible. This intimation in writing to the contractor under the hand of the Engineer-in-charge of the work shall be conclusive evidence of the employment of another Bidder.

27. SAMPLING, TESTING & ACCEPTANCE CRITERIA:

Sampling & Testing of the concrete cubes shall be conducted for all concrete works as per clauses of IS456 and IRS Concrete Bridge Code. The specimen will be tested in a field and occasionally in reputed Government-testing laboratory, in the presence of BBJ / Railway's representative and the report shall be binding on all parties concerned. The quoted rate for concrete works would be deemed to include the cost of casting, curing specimens as well as testing charges. For field testing, calibration of probing ring will be arranged from reputed testing house.

28. PUMPS AND PLASTICISER:

- 1) Additives containing calcium chloride are forbidden in concrete.
- 2) Approval of an expert Bidder suggested by the Chief Engineer shall be obtained prior to the use of admixtures or super - plasticizers if proposed by the Tenderer / Contractor. The contractor shall have to furnish the details/ chemical ingredients etc. duly tested for the approval of Engineer in-charge.
- 3) When concreting under water, the mix shall contain 10% extra cement than for a corresponding mix for concreting in the dry.
- 4) Transporting and placing, shall be according to Clause 12 of IS 456-2000. Transporting of the concrete shall be done so as to ensure monolithic and dense concrete without hollows honey comb needing thereafter.
- 5) In case concrete is planned to be poured with the use of the concrete pumps as per provisions of I.S. code /American code. **The concrete mix shall be designed and approved by Engineer including use of particular plasticizer. The cost of plasticizer and extra cement, plant, fuel etc. if required, will be supplied by the contractor and for which no extra payment will be made.**

29. PLAIN/REINFORCED CEMENT CONCRETE

- a) These items of work envisages cement concrete works (of approved design mix as specified) as appropriate in foundation and other components of the structure below ground level and above G.L.
- b) For the purpose of determining the quantities of the work the average ground level shall be determined by the Engineer or his representative as related to the original ground levels with the periphery of the work, his decision in this regard being final and conclusive.
- c) The measurement for the payment shall be worked out to the nearest 0.01m³ with the size of the cement concrete elements being determined as per the dimension specific in the Railway's drawings/ requirements as directed by the Engineer or his representative without any deductions for the Anchor rods or Dowel bars or the stone ware / A.C. pipe

30. SPECIFICATIONS FOR STEEL GIRDER & FABRICATION WORK

- 1.a Fabrication work shall be done either by RDSO approved vendors for fabrication of bridge girders or from the other vendors by following STR (Schedule Technical Requirements) and QAP (Quality Assurance Plan) approved by CBE of Railway, for fabrication works in workshop. The fabrication has to be done in a well-established factory/workshop having guided submerged arc welding facilities. The fabricated

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girder/column/other structural parts will be transported to site of work by contractor's own means at his own cost. Any decision by BBJ/ Railway's representative regarding minimum number of shuttering sets, jigs, plants, machinery etc in this regard shall be final and binding on the contractor. The contractor shall ensure free/uninterrupted access to fabricator workshop for inspection during execution of work and ensure all arrangements/ facilities for inspection (inspection, transport & stay etc, if required).

- 1.b Fabrication of steel Girder will be as per BBJ/ Railway's approved drawing, specification. Fabrication has to be done with the help of approved Jigs. The Contractor will be required to submit quality assurance plan (QAP) and full details of welding procedure (WPSS) in prescribed proforma for approval of Engineer-In-charge. Entire welding to be done by approved welders using approved welding procedure and welding consumables.

Note: Contractor shall provide, at least one (01) nos. of metal Arc welding machine at each site individually during execution of work which will become property of BBJ/ Railway after completion of work for carrying out further maintenance works. Nothing extra shall be paid on this account.

2. Jigs/ Assembly: Contractor will be required to develop jigs for each component, which will be approved by Engineer-Incharge/authorized inspecting official of BBJ/ Railway. The fabricated girders will be required to be trial assembled at the premises of the contractor on camber jacks as per details out in Railway fabrication specification Serial No RDSO/B1- 2001.
3. Cost: All the cost of developing and maintaining jigs, doing trial assembly of first girder and / or other subsequent girder or part of it will have to be organized by the contractor at his own cost inclusive of labour, plant and machinery etc.
4. Transport: After inspection & passing of the fabricated components appropriate surface treatment / priming painting as specified in the item and approved by BBJ shall be rendered & components transported to site of work. Contractor will be responsible for making material dumping and girder erection yard as per the requirement for which no extra payment will be made by the BBJ to the Contractor.
5. Fabrication Workshop for Steel Bridge Girders:
 - i) Contractor may fabricate steel girders at his own RDSO approved workshop.
 - ii) The Workshop will be established as per the guidelines given in STR for Fabrication of Steel Girders (w.e.f. 01.12.2019). It has to be approved by RDSO. All activities like site clearance, necessary approvals from state/local authorities, construction of workshop, electric/power connection, water supply, T&P, machinery, process of RDSO approval etc. will be carried out by contractor on his own cost, in reasonable time fitting in overall timeline of project. Rates of steel fabrication are inclusive of all such activities.
 - iii) Railway may provide available and sparable land free of cost as per availability of the land. All development of area such as leveling, earth filling, drainage etc., will be done by the contractor at his own cost.
 - iv) Probable site for erection in railway land, is to be set up near the Station in vicinity. Contractor must visit the site to assess his requirement and availability of railway land there and get approved from railways.
 - v) Contractor will arrange private land at site approved by Railway, for fabrication workshop on his own. No extra payment will be made for this. BBJ / Railway will approve such site considering security, ease of inspection and transport etc. and BBJ / Railway's decision will be final.
 - vi) Whether girders are fabricated at already established RDSO approved workshop elsewhere or in workshop at site, item rate of steel fabrication covers the cost of transportation of girders to site vii) Inspection of steel girders shall be done by the inspection unit of NCR or RDSO itself. QAP will be prepared by fabricating

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Bidder and approved by inspecting Bidder. Inspection charges will be borne by Contractor if any.

6. Codes and Specifications: The materials as well as execution of works shall be confirming to the following specifications and codes of practice (Latest Revision of the Specification /Codes & up to date correction slips to be referred). Indian Railway Standard Codes And Specifications:

- (i) IRS : Bridge Rules
- (ii) IRS : Welded Bridge Code(1972)
- (iii) IRS : Steel Bridge Code
- (iv) IRS : B1-2001 for Fabrication and erection of steel bridge girders.
- (v) IRS : M-28 Specifications for electrodes. Indian Standard Specification
- (i) IS : 2062-1999 Specification for structural steel
- (ii) IS : 814-1961 Specification of covered electrodes for manual metal arc weld
- (iii) IS : 9595-1980 Specification for metal arc welding of carbon & carbon manganese steel.
- (iv) IS : 816-1968 Specification for metal arc welding for general const. in mild steel
- (v) IS : 102 Specification for ready mixed paint brushing red lead non setting priming
- (vi) IS : 123 Specification for ready mixed paint brushing, finishing
- (vii) IS : 2004 Specification for carbon steel forging
- (viii) IS : 822 Code of practice for inspection of welds
- (ix) IS : 1852 Specification for rolling and cutting tolerances for hot rolled steel
- (x) Specification of submerged arc welding In addition to above any other IS or IRS specification as applicable and approved by Railway.

7. Material:

- i. Contractor has to procure all the raw materials from SAIL, TISCO & RINL only.
- ii. All structural steel section should confirm IS-2062 Gr. B fully killed, fully normalized also if plate thickness is >12mm.
- iii. All material shall be free from surface defects like notches, dents, bends excess rolled material, over/under dimensions.
- iv. Rolling & cutting tolerances shall be in accordance with IS 1852.

8. Test certificates:

- i. For raw materials like structural steel, rivets, HSG Bolts, Nuts, Washers, Aluminium Wire, Paints etc., the contractor shall furnish original copies of test certificates from the original manufactures. If any testing of material like test for ascertaining normalizing of steel, metallurgical/chemical composition, mechanical strength etc. is required by the BBJ / Railway or their authorized inspecting Bidder, in respect of any items, this shall be arranged by the Contractor at their own cost from authorized Test House & submitted in the format given. No. of such tests for steel will be limited to no. of heats from which raw material has been manufactured for each type. Test for other material like paint etc. will be limited to No. of manufacturing batches from which material has been supplied.
- ii. Any approval given by the BBJ/ Railway's authorized inspecting Bidder, in consequence of such tests or analysis, shall in no way limit or interfere with the absolute right of the BBJ/ Railway to reject the whole or portion of such materials supplied, which in the judgment of the Engineer in charge do not comply with the conditions of the Contract. The decision of the Engineer in charge, in this regard, shall be final and conclusive for all purposes.
- iii. All manufacturer's certificates of tests, proof sheets, mill sheets, etc. showing

that the materials tested conform to the requirement of the appropriate Indian Standard & other relevant Standard Specifications should be submitted to BBJ and Railway.

9. Samples & Testing

- i. In addition, the Engineer shall have the right to ask the contractor at any time to draw samples of any materials from its stockpiles or any other locations to be inspected by the Engineer or his representative. The samples are to be drawn in accordance with IS:2062 and tested in laboratory approved by the Engineer in accordance with the appropriate clause of IS:2062 at the cost of the contractor.
- ii. Besides, the tests required under clauses quoted herein above, the Engineer or his representative may order tests to be carried out by an independent person or organization appointed by him at such place or in such laboratory as he may determine in accordance with the appropriate clause of IS: 2062 and the cost of such tests shall be borne by the Contractors. The results of all such tests mentioned herein above shall be forwarded to the Engineer or his representative for record.

10. Fabrication process: The contractor shall make his own arrangement at his cost for the full-scale templating on high level steel/concrete platform under covered shed and making of steel template hereafter referred as masters of each and every component type. The BBJ will supply no steel in this connection. The templates used throughout the work shall be of steel and will be used for making jigs and subsequent checking and repairs to jigs only. Work of fabrication shall be done as per relevant IRS specification and Codes.

a. Camber:

- i. In order to ensure that the fabrication and erection of main girders shall be such as to eliminate secondary stresses in the loaded span, the nominal length (i.e. the length which will give no camber) of members shall be increased or decreased by the amounts shown on the camber diagram.
- ii. All material plates, angle etc. shall have straight edge, flat surface and free from twist. The adjacent surface or edge shall be in close contact or at uniform distance throughout.
- iii. The face of compression member shall be machined so that the faces are at right angles to the axis of the member and at the joint when made out will be in close contact throughout.
- iv. Contractors have to use mechanically controlled torch for flame cutting. All flame cut edges shall be grind properly to remove all burrs etc. No drag line, bevel cut shall be permitted.
- v. Contractors have to take special care to ensure that ends of all plates and members are in close contact. No making up of surface etc. will be allowed without ascertaining its structural adequacy by radiography testing.
- vi. Contractor shall have to arrange use of hydraulic yoke hammer for riveting wherever possible.
- vii. Only full length of plates/angles/Rolled section shall be used & no joints will be allowed in any of the component.
- viii. In the fabrication of girders, necessary arrangements and provision shall be kept for inspection facilities underneath the girder and for carriage of service cables, pipelines etc. as per approved drawing.

b. Inspection and progress report:

- i. The quality assurance will be drawn duly approved by Engineer-In-charge.

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- The raw material and fabrication work shall be inspected by the BBJ / Railway through Engineer-Incharge /authorized inspecting official of BBJ and railway for which free accommodation and facilities will have to be provided by the contractor. The work of fabrication in contractor's fabrication shop will at all times be open for inspection by the BBJ / railway or their authorized inspecting official. Before dispatch of fabricated steelwork from the shop, they will be inspected in the contractor's workshop by the BBJ / Railway or their authorized inspecting official who will thereafter issue inspection certificates. The tests will be carried out at contractor's cost. All facilities as required for carrying out the inspection will be provided free of cost by the contractor including those requiring the services of outside agencies & all measuring tools, gauges, template etc.
- ii. Any defects noticed during inspection in the execution of the work shall be rectified or replaced by the contractors at their own cost. The decision of the BBJ / railways or its inspecting Bidder as to the existence of defect, the manner in which the defective work to be rectified or replaced shall be final, conclusive and binding on the contractors. No extra claim, whatsoever, shall be entertained for the cost of such rectification or replacement.
 - iii. The progress of fabrication of steelwork as well as execution of all works shall be subject to periodic review by the BBJ / Railway Administration.
 - iv. The contractors shall provide all facilities to the BBJ / Railway's representative to make periodical detailed assessment of the progress of the works. Such information and progress reports as may be called for by the BBJ / Railway and at such intervals as specified shall also be made available.
- c. Trial assembly:**
Fabrication of steel girders will be done by the RDSO approved firms only.
- i. Fabricated girders will be required to be trial assembled at the premises of the contractor on camber jacks as per details out lined in B1/2001. All the cost of developing and maintaining jigs doing trial assembly will have to be organized by the contractor at his own cost inclusive of labour, plant and machinery, leveling instruments, theodolite, piano wire etc.
 - ii. After trial assembly of girders and their components, it will be inspected by authorized inspecting official of BBJ / railway for ascertaining the desired quality & designed camber etc. After passing of the assembly the span will be dismantled and subjected to surface treatment as specified by contractor at his own cost.
- d. Interchange ability:**
For interchangeable members, as certified by the Inspecting Officer, a simplified scheme of marking will be permitted, i.e. all pieces, which are identical, shall bear one distinguishing mark irrespective of the span to which they belong. If the Inspecting officer is not satisfied the members are interchangeable, the whole of the spans must be erected complete and all parts marked to their place without additional charge.
- e. Surface Treatment**
- i. No component is to be given any surface treatment without component being passed and embossed by BBJ / Railway's authorized Inspecting official.
 - ii. Surface cleaning, for components not to be metalized, will be done by using mechanized wire brush and/ or grit blasting. After grit blasting inspection shall be done by BBJ / Railway's Authorized Inspecting official to conform surface finish to Sa 2-1/2 of Appendix 'A' of IS 5909. After passing of

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- surface preparation priming coat shall be applied either manually with brushes or by mechanical means to the satisfaction of the Engineer-in-charge. No priming/painting work will be permitted during the monsoon period from June to September.
- iii. Protective painting: After inspection and passing of priming coat by BBJ/ Railway's Authorized Inspecting official, protective coat of paint shall be done as per item of work and relevant IS codes either manually with brushes or by mechanical means to the satisfaction of the Engineer-in-charge.
- iv. Determination of local thickness of paint: The minimum local thickness of paint shall be determined by ELCOMETER. Minimum two digital Elcometer will have to be provided by the contractor at his own cost for determination of metalizing / painting thickness. One of the digital elcometer will have measuring range of 0 - 100 micron & other will have a measuring range of 50-250micron. Contractor shall provide, at least two (02) nos. of Elcometer at each site individually during execution of work which will become property of BBJ / Railway after completion of work for carrying out further maintenance works. Nothing extra shall be paid on this account.
- f. Transportation:**
- i. No components are to be transported to site without being rendered surface treatment.
- ii. The contractor has to transport with loading/unloading and stacking all the fabricated material including loose fittings with his own truck/trailer, tools, plants & machinery and labour etc. at his own cost. While, the fabricated material will be transported to the depot at Bridge site demarcated by the BBJ / Railway,
- iii. Though approach road is existing to the site of work, BBJ/ Railway does not take any responsibility of maintaining it in fit condition for movement of heavy/light transportation vehicles. Contractor will have to make his own arrangement at his own cost for maintaining motor ability of approach road.
- iv. The contractor has to arrange wooden Gutaka / Sleepers to keep the material at least 12" above the ground level.
- v. The contractor has to take all precaution during transportation/loading / unloading/stacking to avoid damage to fabricated material. If any damage to any of the members is caused, the particular components will be rejected by the Engineer-In-Charge at site or his representative. Any material found damaged during transit and/or unloading will be stacked separately & damaged portion shall be marked by white paint. Contractor will have to organize rectification/replacement of all such defective component at his own cost to the entire satisfaction of the Engineer or his Authorized Representative.
- vi. Under special arrangement with the purchaser it shall be permissible for approved portions of the work to be dispatched before complete erection of the first span provided the contractor satisfies the Inspecting Officer that such portions of the work are strictly interchangeable and will assemble correctly and accurately in the complete structure.
- vii. All trucks/ trailers are to be loaded in such capacity so as to ensure safe transport of fabricated materials.
- g. Assembling and erection:**
- i. The Contractor shall observe sufficient accuracy in the assembling and erection of every part of the work to ensure that all parts fit accurately together on erection. The Contractor shall maintain a master steel tape of

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- approved make for which he has to obtain a certificate of accuracy from the National Test House calibrated under a tension of 1.8 Kgs. At 16.7C.
- ii. Erection & Equipment:
- a) The Contractor shall provide at his own cost, all tools, machinery, equipment and erection material necessary for the expeditious execution of the work and shall erect the structural steel and iron work, in every respect as covered by the contract and in accordance with the drawings and specifications.
 - b) Before starting the work the contractor shall submit detailed launching plan/erection scheme to the Engineer-in-charge with complete details of equipment he proposes to use which shall be subject to the approval of the Engineer-in-charge other BBJ / railway officials, the approval of the Engineer shall not be considered as relieving the contractor of the responsibility for the safety of his method or equipment or from carrying out the work in full accord with the drawings and specifications.
 - c) All temporary works shall be properly designed and substantially constructed for the loads, which it will be called upon to support. Adequate allowance and provision of lateral forces and wind loads shall be made according to local conditions. Careful and periodical inspection of plant shall be made by the Contractor to ensure that all tackle, ropes, chains and other important lifting gear and machinery are in good order and fit for service and well up to the capacity for which they are required.
 - d) When chains are used for lashing, care must be taken to protect the edges of members to avoid the marking and distortion otherwise caused. h. Deflection test: All the arrangements required for carrying out deflection tests shall be made by the contractor of any of the span as decided by Engineer in charge and all required material, testing equipment's, labour etc. will be arranged by the contractor. The testing report shall be submitted in three copies to the BBJ and Railway, the deflection will be conducted in supervision of BBJ / Railway's Engineers.
- h. Bearing And anchorages:**
- a) Bed plates of bearings shall be set to required level and fixed accurately in position by giving full and even bearing by setting them on a layer of cement sand material as approved and directed by the Engineer.
 - b) The Contractor shall drill the holes where necessary and set the anchor bolts. The bolts shall be set accurately and fixed with cement grout or another grouting material as approved by the Engineer, completely filling the holes.
- i. Deflection test:**
- All the arrangements required for carrying out deflection tests shall be made by the contractor of any of the span as decided by Engineer in charge and all required material, testing equipment's, labour etc. will be arranged by the contractor. The testing report shall be submitted in three copies to the Railway, the deflection will be conducted in supervision of Railway's Engineers.
- j. Method of measurement:**
- For the purpose of payment, quoted rates apply to the weights of steel work, calculated from final working drawings based on theoretical standard weights given in the producers' hand books and using minimum square overall dimensions. No Deductions will be made for skew cuts, and notches. Each gusset

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shall be on the dimensions of the smallest enclosing rectangle. In additions, for riveted components, 3% will be added to the estimated weights calculated as above.

k. Quantity:

If the tenderers make use of any estimated quantity, which may be given to them in the Schedules or Tender drawings or in any other way, they do so at his own risk and will not be entitled to make any claim or demand or to raise any question whatsoever on account of any errors or miscalculations in the said quantity.

l. Rejection of materials: Bridge components shall be tested before leaving the manufacturer's premises. Bridge components will also be tested at the site and they may be rejected if found not suitable or not in accordance with the specifications, notwithstanding the result of tests at manufacturer's work shop or elsewhere or test certificates.

m. Record To Be Maintained Contractor has to maintain the following records during execution of the work.

- (i) Inspection/test certificate for raw material (All sections) by the original producer of the material. Inspection Register for material used for fabricating various components, should give details of Heat No., Cant No. and relevant test certificate from SAIL/ TISCO/ RINL (original manufacturers) as per IRS Specification B1-2001.
- (ii) Record of Inspection of templates floor/ templating by the Internal Inspecting Authority as per IRS Specification B1- 2001.
- (iii) Jigs/ fixture register: incorporating inspection & clearance of jig by internal & BBJ / Railway's inspecting officials including details of subsequent checking of jigs and rectification thereafter as per IRS Specification B1-2001.
- (iv) Register showing clearance of internal quality control organization for initial assembly, tack assembly, second initial assembly, final assembly for every component as per IRS Specification B1-2001.
- (v) Welding register-indicating No. and location of defective welding during initial inspection for each component, defects detected by Authorized BBJ / Railway Inspecting Officials and compliance thereof.
- (vi) Final passing register: shipping mark wise along with embossing seal of Rly's inspecting officials (embossment is essential on each component also before applying any surface coating.
- (vii) Register for painting thickness and surface preparation.
- (viii) Measuring Equipment Testing Register: All measuring equipment used should be regularly tested for proper accuracy and record of the same to be kept for inspection of BBJ / Railway inspecting official. Every measuring equipment should have connectivity with equipment tested at the National Test House.
- (ix) Dispatch Register giving details of material dispatched span wise:
- (x) Material handing over register.
- (xi) Any other register as required by Authorized Inspecting Bidder.
- (xii) Plant And Machinery Register: This register will record daily the particulars of machinery with the contractor and will be signed jointly by the Engineer's Representative and the contractor. This will also indicate the particulars of the machinery out of order/under repairs.
- (xiii) Material Offering And Inspection register This register shall be maintained separately for each work order for keeping record of material offered for inspection, inspection remarks and passing details. One page should be allotted for individual members of fittings. Proforma shall be as under:-

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Description of component/fitting: Shipping mark: Quantity required per span:

Span No.	Initial of Supervisor offering material for inspection	Rlys inspecting officials Inspection Remarks	Compliance action	Seal & initial of Rlys Inspection Official	Despatch& Consignee details.
1	2	3	4	5	6

31. SPECIFICATIONS FOR EXPANSION JOINTS

1. This item includes designing supplying providing and fixing in position the approved type expansion joints for ROB/Bridges.
2. The item includes all lead, lift, testing charges and work at all location and inclusive of all material labour for fixing the joint at required and nominated place.
3. The measurement will be for the exact quantity used on work and not the part which is left over or left after fixing the joint.
4. Contractor shall take prior approval from BBJ / Railway's Engineer in charge after submitting details and drawing.
5. The expansion joints at fix end and free end shall be provided according to the details shown on the approved drawings and in presence of manufacturer's representative.
6. Suitable arrangements to prevent ingress of ballast inside ballast retainers shall be provided as shown in the drawing.
7. Expansion joint shall be provided for full width of super structure and ballast retainer.
8. Inspection: Expansion joints shall not be used without the proper inspection certificate to be issued by the inspecting authority or any representative as directed by the Engineer in charge, certifying the approval of expansion joints. Testing charges including cost of material shall be borne by the contractor.
9. The expansion joints and accessories thereof shall be subjected to all the specified tests as per relevant standard specifications on raw materials as well finished products in presence of Engineer in charge or his authorized representative at the manufacturer's works or at other approved laboratory as decided by Engineer in charge.
10. The contractor shall therefore, select a suitable expansion joints manufacturer having complete plant testing facilities so that the expansion joints under manufacturer can be tested at the place of manufacturer itself. Test certificates for the steel sections shall also be submitted by the manufacturer to the inspection Bidder.

32. PRECAST RCC/PSCUNITS

The concreting of the pre-cast units shall be done in right sequence and pouring shall be done in an approved manner in once complete operation. All holes for holding down bolts for temporary lifting arrangement, fixing ladders, ducts, vents, anchorage cones, sheaths etc. shall be provided in an approved manner according to the drawing. All pre-cast concrete unit shall be well vibrated, top surfaces of slab being finished with vibrating screens or plates to ensure a properly closed surface. All pre-cast units shall be molded to exact shapes, sizes and dimensions as shown in the approved drawings or as instructed by the Engineer.

33. PILE FOUNDATIONS

1. Construction of bored pile foundations shall be strictly in accordance with the stipulations made in the building digest CBRI Indian 56 for bored piles for foundation

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- and IS 2911-1979 part-I sec.2 & 3.
2. Wherever the tilt of the piles exceeds 2% or the piles shifts by more than what is specified area will have to be increased and also additional reinforcement will have to be added, and expenditure involved including cost of cement and steel shall be borne by the contractor.
 3. The tenderer shall have to remove all the released materials, debris etc. from the site of bridge, the same day it is dismantled, to keep the site clear of any infringement and shall stack the same as directed by Engineer in charge.
 4. The work will have to be carried out only on the basis of final approved plans. Any increase in depth of Piles required as per design/drawing to bring them in conformity with the design criteria and specifications shall be carried out by the contractor.
 5. Rates: The rate quoted by the contractor shall be inclusive of all rate for Boring Piles through all types of soil including boulder and such other obstruction etc. including all machinery and plants, all royalties, freights etc. required for efficient execution of work. No extra payment will be made on this account whatsoever.
 6. For the purpose of payment, then length of Pile will be measured from the bottom of the Pile to the bottom of the Pile Cap. The Engineer in charge will decide the exact level of the bottom of the Pile Cap. Any other Earthwork necessary for casting and boring Piles will not be paid for separately and the rates should be inclusive of all such Earthwork as may be necessary.
 7. Testing of Piles: Initial and routine load testing of Piles shall be carried out for both vertical and lateral loading as directed by the Engineer and the same shall conform to IS 2911 Part IV of 1979.
 8. Initial & routine pile load tests and installation of test piles for initial load tests are payable under this contract and will be paid under the relevant SOR/NS item. In case, test pile fails prematurely, during testing, due to construction defects, no payment will be made for installation and testing. The number of initial and routine load tests will be decided as per IS 2911(part-IV) and as per engineer in-charge, in accordance with codal provisions. If test procedure is faulty and/or loading capacity is found unstable/inadequate etc., causing a failure of testing procedure and abandonment of test pile, then cost of testing and test pile will not be paid.

34. WELL FOUNDATION

Not in scope of work.

35. READY MIX CONCRETE

Indian Railway Standard Code of Practice for Plain, Reinforced and Pre-stressed concrete for General Bridge Construction (Concrete Bridge Code)

Note: Based on Correction Slip No. 3 dated 01.08.2000 to Concrete Bridge Code 1997.

1. Ready Mixed Concrete (RMC): RMC means concrete produced by completely mixing cement, aggregates, admixtures, if any, and water at a Central Batching and Mixing Plant and delivered in fresh condition at site of construction.
2. Use of Ready Mixed Concrete: Ready Mixed Concrete may be used, wherever required. It shall conform to the specifications of concrete, as laid down in the Concrete Bridge Code. For other aspects, which are not covered in Concrete Bridge Code IS: 4926 (Specification for Ready Mixed Concrete) may be referred.
3. Effect of transit (transportation) time on Ready Mixed Concrete: As Ready Mixed Concrete is available for placement after lapse of transit time, reduction in workability occurs, which may lead to difficulty in placement of concrete. In addition, in case of longer transit time, initial setting of concrete may also takes place, which may render

it unusable. Thus, while planning for using of Ready Mixed Concrete, these aspects should be kept in view.

4. Checking suitability of Admixtures: Generally, admixtures, like water reducing agent, retarder etc., are used in Ready Mixed Concrete for retention of desired workability and to avoid setting of concrete. In such cases, admixtures should be tested for their suitability as per IS: 9103 at the time of finalizing mix design. Regarding specification of admixtures, clause 4.4 of Concrete Bridge Code may be referred.
5. Re-tempering with Concrete: Under any circumstances, re-tempering i.e. addition of water after initial mixing, shall not be allowed, as it may affect the strength and other properties of concrete.
6. Time period for delivery of Concrete: The concrete shall be delivered completely to the site of work within 1½ hours (when the atmospheric temperature is above 20°C) and within 2 hours (when the atmospheric temperature is at or below 20°C) of adding the mixing water to the dry mix of cement. Special measures as approved by the Engineer-in charge will be taken if transit time is more than 2 hrs.

Note: RDSO Guide line (BS-23) shall be referred on use of Ready – mix Concrete.

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SPECIAL CONDITION OF CONTRACT

1. **DEFINITIONS AND INTERPRETATION**

In this Tender Document, as hereinafter defined, the following words and expressions shall have the meaning as under:

- a) "**BBJ**" shall mean The Braithwaite Burn And Jessop Construction Company Limited having its registered office at 27, R. N. Mukherjee Road, Kolkata- 700 001.
- b) "**TENDER**" shall mean the proposal submitted by the Tenderer/ Bidder/ Supplier/ Dealer/ Bidder in response to BBJ's Notice of Invitation to this Tender Document.
- c) "**ORDER**" shall mean a written Work/ Purchase Order issued by BBJ.
- d) "**TENDERER/ BIDDER**" shall mean the firm or Company (hereinafter called Tenderer/ Bidder) who duly submits the tender after accepting all the terms & conditions of the tender document.
- e) "**SUCCESSFUL BIDDER**" whose tender has been finally accepted by BBJ.

2. **ELIGIBILITY CRITERIA**

Supporting documents to be submitted in the Techno-Commercial part of the tender.

a) **Technical Criteria:**

The tenderer must have successfully completed or substantially completed similar works (not less than 75%) during last seven years ending last day of month previous to the one in which applications are invited and should be either of the following:

- (i) Successfully completed or substantially completed at least **3 (three)** such similar works each costing not less than **30%** of the advertised value of tender
Or
- (ii) Successfully completed or substantially completed at least **2 (two)** such similar works each costing not less than **40%** of the advertised value of tender
Or
- (iii) Successfully completed or substantially completed at least **1 (one)** such similar work costing not less than **60%** of the advertised value of the tender

Note:

- (i) "**Similar work**" shall mean successful/ substantial execution of any major bridge single span 62.0M or above with RCC Substructure and Composite Girder & RCC Deck Slab during last 07 (seven) years for any Government Organization/ PSU Organization/ Other organization.
 - (ii) Completion certificate(s) of orders or ongoing up to date work done certificate/ Document as per the above criteria to be submitted by the bidder.
 - (iii) Substantial completion shall be based on 75 (seventy-five) percent (value wise) or more for the works completed under the contract. Certificate for 'substantial completion' of project/ work/ asset should contain two parts. Part-I shall contain 'financial value of work done' and part-II shall contain 'certificate of functional completion of project/ work/ asset'.
- b) Fabrication work shall be done either by RDSO approved vendors for fabrication of bridge girders or from the other vendors by following STR (Schedule Technical Requirements) and QAP (Quality Assurance Plan) approved by Railway/BBJ, fabrication works in workshop.

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c) **Financial Criteria:**

i. Average Annual financial turnover during the last 03 (three) financial years, ending 31st March of the previous financial year **at least 30% of advertised value of the Tender.** However, in case balance sheet of the previous year is yet to audited, the audited balance sheet of fourth previous year shall be considered.

ii. Certificates in the form of Audited Balance Sheet and Profit & Loss account shall be produced by the tenderer(s) to this effect duly certified by the Chartered Accountant.

d) Other documents as mentioned on Para 5(d) of the Instruction to Bidders - Submission of Bid: Techno-Commercial Part is to be submitted.

3. **COMPLETION PERIOD**

Time is the essence of this contract. The duration of work is **15 (Fifteen) months**, and the date of commencement will be considered the date of issue of a Letter of Acceptance (LOA)/ Work Order, whichever is earlier.

This completion period includes the Monsoon Period.

If the overall completion schedule needs to be extended due to any reason which is solely beyond the control of the successful bidder, the said extension of the completion schedule shall be granted without L.D. subject to the receipt of an extension of the completion schedule by BBJ from RAILWAY without L.D.

4. **EXTENSION OF COMPLETION PERIOD:**

Application for the extension of time of completion will be dealt with as per the provision of Railway GCC with ACS no. 126, Clause 17A, 17B & 17C of GCC under Part-II Standard General Condition of Contract. However, for the sake of continuation of work BBJ may grant provisional extension.

Note:

- In case of any disputes regarding interpretation of any of the above clauses, the decision of the BBJ shall be final and binding on the Contractor.
- The work will be executed under the supervision of Railway / BBJ.
- Supply of all materials will be as per Railway's approved list
- All types of testing will have to be carried out as per Railway / BBJ instructions.
- In case of any dispute arises, Railway / BBJ's decision will be final.
- If the client imposes a time extension along with liquidity damage, the same shall be applicable to the Bidder. However, BBJ shall not be held responsible for any liquidity damage.

5. **WORKMANSHIP:**

The workmanship for the job shall be closely monitored by the Bidder's supervisory staff as per the specification and as directed by the Engineer/ Engineer In-Charge of BBJ/Railway and/or any other authorized Bidder of Railway. Any work done by the successful bidder is found unsatisfactory or a major mismatch is observed at the site that should be rectified/ redone as per the instructions, immediately after notifying the successful bidder. If the successful bidder fails to do so and the same is done by BBJ then BBJ will also recover the same amount from any due payment of the successful bidder. **Any rejection on grounds of quality shall be re-done at the successful bidder's cost.**

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6. **QUANTITY OF WORK TO EXECUTE**

The total quantity of work as per Bill of Quantity (BOQ) can vary to any extent as decided by BBJ but the unit rate finalized will not change up to the completion of the project.

7. **RATE**

The bidder must quote the Rate, in percentage above/ below/ at-par, including GST and all other taxes & duties for the items mentioned in BOQ. The price must be firm during the tenure of this contract.

Note:

The award of the order or rejection of the Tenderer's offer and/or cancellation of the tender will be made at the absolute discretion of BBJ. BBJ reserves the right to cancel or accept or reject any or all tender(s), whether lowest or otherwise, without assigning any reason(s), whatsoever thereof. A tenderer whose tender is not accepted shall not be entitled to claim any cost, charges, or expenses incidental to or incurred by him through or in connection with the preparation and submission of the Tender/Offer to BBJ. BBJ also reserves the absolute right to split up and award the requirement between two or more Tenderers.

The Rates will be valid and remain firm for the entire duration of the work order. No revision/alterations of unit rates shall be entertained.

8. **TERMS OF PAYMENT:**

8.1 **MEASUREMENT OF WORK BY CONTRACTOR:**

1. This clause is to be read with clause 45(ii) of Railways GCC with ACS no. 1to 6. Measurement of work by contractor is allowed in works tender having value Rs. 5 crore or more. (ref. RB L. No. 2017/Trans/01/Policy dt. 8/2/18) vide addendum & Correction Slip (ACS) no. 50 to Indian Railway code for engineering dept for introduction of measurement and record of 'Executed works' by contractor in Railway Construction works.
2. For details procedure and instructions please refer Addendum & Correction slip No. 50 to Indian Railways Code for Engineering Department in reference to Clause 1316 A of Indian Railways Code for Engineering Department.
3. Tax Invoice shall be submitted by the bidder monthly on or before the date fixed by BBJ for all works executed in the period of the month. Payment will be released stage-wise based on the certified bill as accepted by RAILWAY and this shall apply to the successful bidder.

Note:

1. Fabrication work shall be done either by RDSO approved vendors for fabrication of bridge girders or from the other vendors by following STR (Schedule Technical Requirements) and QAP (Quality Assurance Plan) approved by CBE, for fabrication works in workshop. The fabrication has to be done in a well-established factory/workshop having guided submerged arc welding facilities. The fabricated girder/column/other structural parts will be transported to site of work by contractor's own means at his own cost. Any decision by BBJ's representative regarding the minimum number of shuttering sets, jigs, plants, machinery etc. in this regard shall be final and binding on the contractor. The contractor shall ensure free/uninterrupted access to fabricator workshop for inspection during execution of work and ensure all arrangements/ facilities for inspection (inspection, transport & stay etc., if required).

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8.2 **PAYMENT SCHEDULE:**

- A. **Payment against R/A and final bill will be released immediately within 5 working days after getting payment from Railway for the same work.**
- B. For releasing Final Bill - No Claim Undertaking confirming that the "The Successful bidder" has no claims of any nature against the work order and/or the work done against the work order.
- C. Unconditional acceptance of the final bill and measurements entered therein
- D. Unconditional Undertaking that The Successful bidder has complied in full with the Legal/ Statutory obligations about the labour engaged by him on the job including payment of terminal benefits if any, and that he indemnifies BBJ of any obligation/ liability that may arise owing to any representation of any workmen employed by him.
- E. A Clearance Certificate from BBJ confirming that no job is left as per BOQ/ Revised BOQ for the work.

9. **TAXES & DUTIES**

The successful bidder shall be exclusively responsible for payment of all Taxes, Royalties etc. (**including Goods and Service Tax**) that may be levied from time to time according to the Laws & regulations now in force & also hereafter to be imposed, increased or modified from time to time. Nothing will be payable extra by the Company in respect of any duties/ taxes to be imposed on the procurement of materials for execution of the contract.

10. **GOODS AND SERVICE TAX (GST)**

- a) The successful bidder shall be liable to pay all applicable taxes [**including Goods and Service Tax (GST)**] or any other tax or cess and show the amount of CGST, SGST, IGST, Cess or any other tax, as applicable, separately in the bill/ invoice/ debit/ credit notes. Successful bidder shall quote their GST Identification No. (GSTIN) in all its bills/invoices/ debit/credit notes.
- b) The successful bidder has to provide a proper invoice/ debit/ credit notes bearing QR Code wherever applicable in the form and manner prescribed under rules of the GST Act/ rules containing all the particulars mentioned therein. In the event the successful bidder fails to provide the invoice/debit/credit notes in the form and manner prescribed under GST, then in the event of such non-compliance of the GST Act/Rules, the successful bidder shall be liable to indemnify for any losses to the Company.
- c) The successful bidder shall raise their tax invoice in the regular interval as per contract condition and upload their supply invoice in GSTN Portal through GSTR-1 return with 10th of next month. Mismatch in return of BBJ due to any reason attributable to the bidder, the same shall be recovered from Bidder's bill.
- d) The successful bidder shall upload/ submit/ report all supply invoices/ debit/ credit notes details in the form of prescribed statements/returns on the GSTN portal on or before the prescribed due dates date as per GST act/rules. The successful bidder shall pay the balance payable GST amount against supplies made to the Company on a monthly basis within due date from the appointed date regularly. Successful bidder shall reconcile the differences/ mismatches in submissions on GSTN portal if any before submission of their final monthly return.
- e) The successful bidder shall issue a credit note or debit note (if any) with reference to an original invoice within the prescribed time limit as per GST Act/ rules only after acceptance from the Company and the same shall be uploaded by the successful bidder in the GSTN portal in the same month. Successful bidder shall issue and submit the supplementary invoices (if any) with reference to original invoices to the Company

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promptly and within the prescribed time limit as per GST act/rules and the same shall be uploaded by the successful bidder in the GSTN portal in the same month. In case there is any loss of credit or additional liability and/ or interest etc. arises due to non-compliance by the successful bidder, the same shall be reimbursed by the successful bidder to the Company. In case the successful bidder disqualifies in any of the above, please note that the input tax credit (GST) shall not be available to the Company and the Company has right to hold the GST amount without any intimation until the matter get resolved and credit is available to the Company.

- f) In the event where the input tax credit of the GST charged by the successful bidder is denied by the tax authorities to the Company, the Company shall be entitled to recover such amount from the successful bidder by way of adjustment from the next tax invoice/debit note. In addition to the amount of GST, the Company shall also be entitled to recover from the successful bidder interest along with applicable penalty imposed on the Company under GST laws. It is further agreed that in case the successful bidder fails to charge GST, if applicable, on the services/activities forming part of this agreement, at the time of raising invoices; the Company shall not be liable or responsible for reimbursing such tax, at any later date.
- g) The Company reserves the right to change the aforesaid GST/ Tax terms and conditions as notified from time to time by Government of India or respective State Governments. It is further clarified that all payments under this agreement shall be subject to withholding taxes, if applicable.
- h) At present GST-TDS is applicable. Deduction of GST-TDS at source would be enforced from the running bills at the rates prescribed. The GST (i.e., SGST, CGST or IGST) amount shall be shown separately in invoice and also submit proper Tax Invoice as per section 31 of CGST Act, and Rule 46 of CGST Rules, 2017 to get Input Tax Credit by BBJ.

11. **NEW LEVIES/ TAXES**

In case Government imposes any new levy/tax or modifies rate of existing taxes including GST after awarding of the work during the tenure of the contract, BBJ shall reimburse the same at actual on submission of documentary proof of payment subject to the satisfaction of BBJ that such new levy/tax applies to this contract.

12. **PERFORMANCE GUARANTEE**

- a) For due and faithful fulfilment of the contractual obligations, the successful bidder shall furnish a Performance Guarantee for an amount equivalent to **5% (five percent)** of the contract price/ value of work order either by Bank Draft/ NEFT/ RTGS or in the form of Bank Guarantee. In the event, the Performance Guarantee is submitted in the form of Bank Guarantee the same should be from any Nationalized/ Scheduled Bank of India in the prescribed format of BBJ with due validity period and claim period of 180 days. The aforesaid Bank Guarantee should be submitted within 21 (twenty-one) days from the date of issue of Letter of Acceptance (LOA). BBJ administration reserves the right to cancel the bid and withdraw the LOA if the Performance Guarantee is not submitted within 21 days.
- b) Provided further that after receipt of a specific formal request letter (in writing) from the successful bidder with valid justification/ reason for their non-submission of Performance Guarantee within the stipulated period, the said period of 21 (twenty-one) days for submission of Performance Guarantee may be extended at the sole discretion of the Competent Authority of BBJ. In such event of extension, a penal interest of 12% (twelve percent) per annum on Performance Guarantee value shall be charged for the delay beyond 21 (twenty-one) days, i.e., from 22nd day after the date

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- of issue of LOA and up to the actual date of submission. In case the successful bidder fails to submit the Performance Guarantee even within the extended period, as aforesaid, the bid of the successful bidder shall be liable for rejection by the BBJ administration, and the LOA shall stand withdrawn.
- c) The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 60 days beyond that. In case, the time for completion of work gets extended, the successful bidder shall get the validity of Performance Guarantee extended to cover such extended time for completion of work plus 60 days.
- d) In case the successful bidder fails to submit the requisite Performance Guarantee within the stipulated period as mentioned in the above paragraphs, the bid may consequentially be cancelled by BBJ, and the LOA shall stand withdrawn. The defaulting successful bidder shall be debarred from participating in Re-Tender for that work and his EMD/ SD/ PG/ RA Bills shall be encashed/ invoked/ forfeited. In this regard, the decision of the Competent Authority of BBJ shall be final.
- e) The formal Order shall be issued/ contract agreement (if any) shall be executed within a reasonable time only after receipt of Performance Guarantee from successful bidder. Till such time the order is issued/contract agreement (if any) is executed the successful bidder shall execute the work on the strength of LOA, but no payment shall be made to the successful bidder without order/ contract agreement. In the event the bid is cancelled by BBJ, and LOA is withdrawn accordingly due to non-submission of Performance Guarantee, the successful bidder shall have no right to claim on the executed work if any as aforesaid or any other claim whatsoever.
- f) The value of Performance Guarantee originally submitted by the successful bidder need not be changed for a variation of contract price/ order value up to 25% (either increase or decrease). In case during the course of execution, value of the contract increases beyond 25% of the original value, an additional Performance Guarantee amounting to 5% (five percent) as applicable for the excess value over the original contract value shall be deposited by the successful bidder within 21 days from the date of receipt of intimation from BBJ.
- g) The Performance Guarantee shall be released after physical completion of the work plus after completion of 60 days thereafter based on 'Completion Certificate' issued by BBJ stating that the successful bidder has completed the work in all respects satisfactorily. The Security Deposit shall, however, be released only after expiry of the maintenance period/ defect liability period and after passing the final bill based on 'No Claim Certificate' from the successful bidder.
- h) Whenever the contract is rescinded by BBJ due to failure of the successful bidder, the EMD/ Security Deposit of the successful bidder shall be forfeited, and their Performance Guarantee shall also be encashed. The balance work shall be got done independently without risk & cost of the failed successful bidder. The failed successful bidder shall be debarred from participating in the tender for executing the balance work. If the failed successful bidder is a JV or a Partnership firm, then every member/ partner of such a firm shall be debarred from participating in the tender for the balance work in his/her individual capacity or as a partner of any other JV/partnership firm.
- i) BBJ shall make a claim under the Performance Guarantee for which the BBJ is entitled under the LOA/ Contract (notwithstanding and/or without prejudice to any other provisions in the LOA/ Contract Agreement) in the event of:
- (a) Failure by the successful bidder to extend the validity of the Performance Guarantee as described herein above, in that event BBJ may claim the full amount of the Performance Guarantee from the successful bidder.
- (b) Failure by the successful bidder to pay BBJ any amount due, either as agreed by them or determined under any of the Clauses/ Conditions of the LOA/ Order/

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- Contract Agreement, within 30 days of the service of notice to this effect by BBJ.
- (c) In the event of the LOA/ Contract being rescinded by BBJ under provisions of any of the clause/ condition of the LOA/ Order/ Contract Agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the BBJ.

13. **SECURITY DEPOSIT:**

As security for the proper and faithful fulfilment of the obligation under the order, a Security Deposit equivalent to **5% (five percent)** of the Total Contract Value shall be deducted and should be kept valid till completion of the entire contract period plus 12 (twelve) months i.e., up to end of Defect Liability Period. Security Deposit shall be in the following manner.

The Earnest Money deposited by the bidder along with the tender will be retained by the BBJ as part of the Security Deposit. The balance amount to make up with the total amount of the Security Deposit may be deposited by the Successful bidder in the form of a Demand Draft/ Pay Order or may be recovered by percentage deduction from the contractor's bills.

Recovery of Security Deposit: The Security Deposit/ rate of recovery/ mode of recovery shall be as under:

- Security Deposit for work should be **5% (five percent)** of the Contract value and shall be recovered from the R/A bill.
- The rate of recovery should be at the rate of **10% (ten percent)** of the gross R/A bill amount till the full security deposit is recovered.
- Security deposits will be recovered only from the bills of the contractor and no other mode of collecting SD such as SD in the form of instruments like BG etc., shall be accepted towards security Deposit.

Security Deposit shall be returned to the contractor after successful completion of entire Order plus 12 (twelve) months i.e., after the end of Defect Liability Period and after the following:

- After passing the final bill based on the "No Claim Certificate" with the approval of the Competent Authority.
- Submission of an unconditional & unequivocal 'No Claim Certificate' from the concerned contractor. This certificate, inter alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the contractor and that there is no due from the contractor to BBJ against the contract concerned.

14. **QUANTITY VARIATION**

- There may be quantity variation as approved by BBJ/Railway during the actual execution of work.
- The accepted variation in the quantity of each individual location and item of the contract would be up to **30%** (thirty percent) of the quantity originally contracted.
- 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 up to the limit of 30% variation in the quantity of the individual item of works.

15. **PRICE VARIATION CLAUSE (PVC):**

Price variation Clause (PVC) shall be applicable. Provide further that, in a contract where PVC is applicable, following shall be outside the preview of price adjustments (i.e. shall be excluded from the gross value of the work for the purpose of price variation. PVC Clause as under or amended up to date of closing of this tender shall be applicable) Please refer GCC

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(Year-2022) with ACS no. 1 to 6 Clause 46(A) under Part-II Standard General Condition of Contract.

For calculation of PVC amount, Base month shall be decided one month prior to the tender closing date of Railway/ BBJ. The amount shall be payable whichever is less.

Clause 46A.6, Part II of GCC shall be read as under:

46A.6 The percentages of various components in various type of works shall be as specified for all item(s)/Bill(s) of Quantities in tender document and the same shall be fixed as per table & classification given below:

SN	Classification		1A, 2 & 3A	4A	5A	6A	7	8A	9A	1B, 3B, 4B, 5B, 6B, 8B & 9B	1C, 3C, 4C, 5C, 6C, 8C & 9C	3D, 4D, 5D, 6D, 8D & 9D	3E, 4E, 5E, 6E, 8E & 9E
	Components	*											
1	Fixed	*	15	15	15	15	15	15	15	15	15	15	15
2	Labour	L ₀	20	25	30	20	50	20	20	0	0	10	25
3	Steel	S ₀	0	0	0	0	0	0	0	85	0	50	0
4	Cement	C ₀	0	0	15	0	0	0	0	0	85	0	0
5	Plant Machinery & Spares	PM ₀	30	15	5	20	15	20	30	0	0	10	30
6	Fuel & Lubricants	F ₀	25	15	5	15	15	20	15	0	0	10	20
7	Other Materials	M ₀	10	15	30	30	5	25	20	0	0	5	10
8	Detonators & Explosives	E ₀	0	15	0	0	0	0	0	0	0	0	0
Total			100	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. Tunnelling Works (Without Explosives)

3A All Item(s) excluding 3B or/and 3C or/and 3D or/and 3E

3B Item(s) for supply of Steel

3C Item(s) for supply of Cement or/and Grout

3D Item(s) for Fabrication & Erection of Structures including supply of Steel

3E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

4. Tunnelling Works (With Explosives)

4A All Item(s) excluding 4B or/and 4C or/and 4D or/and 4E

4B Item(s) for supply of Steel

4D Item(s) for Fabrication & Erection of Structures including supply of Steel

4E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

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.

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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

8. Platform, 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

Clause 46A.7 Formulae, Part II of GCC shall be read as under:

46A.7 Formulae: The Amount of variation in prices in various components (labour, material etc) shall be worked out by the following formulae:

$$(i) L = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (L_Q - L_B) \times L_C}{L_B \times 100}$$

$$(ii) M = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (M_Q - M_B) \times M_C}{M_B \times 100}$$

$$(iii) F = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (F_Q - F_B) \times F_C}{F_B \times 100}$$

$$(iv) E = \frac{(W) \times (E_Q - E_B) \times E_C}{E_B \times 100}$$

$$(v) PM = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (PM_Q - PM_B) \times PM_C}{PM_B \times 100}$$

$$(vi) S = \frac{(W \text{ or } W_A \text{ or } W_{SF}) \times (S_Q - S_B) \times S_C}{S_B \times 100}$$

$$(vii) C = \frac{(W \text{ or } W_A) \times (C_Q - C_B) \times C_C}{C_B \times 100}$$

PLEASE NOTE:

(i) This price variation clause shall be applicable during the contract period mentioned herein and the extended period where extension was allowed for the reason of BBJ/ Railway.

(ii) Similarly, this price variation clause shall not be applicable where time extension was allowed by BBJ due to any action / inaction of the successful bidder/ contractor. In this regards decision of BBJ shall be treated as final.

16. **MOBILIZATION ADVANCE**

The mobilization advance, if agreed, shall be up to **5% (five percent)** of the contact value against Bank Guarantee of value comprising of advance amount plus 10% as per the format provided by the purchaser. Mobilization Advance to be interest bearing at the rate of SBI PLR plus 2% above.

Recovery of Mobilization Advance: The mobilization advance shall be recovered as under:

- a) Mobilization Advance, if applicable, for work shall be **5% (five percent)** of the Contract value and shall be recovered from the R/A bill.
- b) The rate of recovery should be at the rate of **5% (five percent)** of the gross R/A bill amount till the full mobilization advance is recovered.

Bank Guarantee against mobilization advance shall be released after the recovery of full mobilization advance plus 30 days.

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17. **SUPERVISION & LABOUR:**

The bidder will be responsible for providing labour of adequate skill and supervisory staff for the timely execution of work.

18. **WATCH & WARD**

The successful bidder is responsible for the watch and ward of the materials. The price quoted by the Successful bidder is inclusive of the watch and ward expenses and no extra claim will be entertained for the deployment of watch and ward or loss, damage of machinery/ materials at the workshop. BBJ shall not be liable for the loss or damage of any of the successful bidder's equipment, machinery and temporary works.

19. **DEFECT LIABILITY PERIOD**

The Successful bidder shall fully guarantee all work as per the scope of this tender/order perform strictly in accordance with the drawings, specifications etc. The work shall be free from all defects. Should any work be not performed as intended or proved defective within **12 (twelve) months from the date of completion of Works**, the work shall upon notification of deficiency/ defect be promptly rectified by the Successful bidder to the satisfaction of BBJ and/or Railway and/or any other Inspection Bidder appointed by Railway without any delay and at no extra cost to BBJ.

If the successful bidder fails to effect proper replacement within a reasonable time of receipt of BBJ's notification to this effect, BBJ shall be free to take such corrective action on the successful bidder.

20. **EMPLOYEES COMPENSATION INSURANCE**

The successful bidder shall submit proof of Employees Compensation Policy for all their workmen/ supervisors and any other person whom the successful bidder will deploy for our Project work before the commencement of the work.

Workmen's Compensation and Employer's Liability Insurance: WC Policy/ Insurance shall be affected for all the employees of the successful bidder. If any of the work is sublet, the successful bidder shall require their Sub-Contractor to provide workmen's compensation and employee's liability insurance for the latter's employees, if such employees are not covered under the Sub-Contractor's Insurance.

21. **PROVIDENT FUND**

The successful bidder will be required to cover all their workmen engaged and eligible under the Employees Provident Fund Act by them under provident fund (P.F.) from the commencement of the work. The successful bidder will have to submit the challan of payment made towards P.F. for their labour and staff to BBJ's HR Department as and when asked for.

22. **STATUTORY COMPLIANCE**

The successful bidder shall ensure strict compliance with all relevant labour laws, Minimum Wages Act, Payment of Wages Act, Industrial Disputes Act, Payment of Bonus Act, Contract Labour (Abolition & Regulation) Act, E.S.I. Act, P.F. Act, Industrial Safety Regulations, laws pertaining to use/storage of explosives for the work. The successful bidder shall submit to BBJ' HR Department declaration as per format enclosed of compliance with payment of Minimum Wages, PF, ESI. Additionally, the proof of the same shall also be submitted to HR Department, as and when asked for as proof of compliance.

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CONFIDENTIALITY OF DOCUMENTS

The successful bidder shall treat all documents, specifications, drawings and contents therein as private and confidential.

23. **SUBLETTING OF WORK**

No part of Work Order nor any share or interest thereof shall in any manner of degree be transferred, assigned, or sublet by the Successful bidder directly or indirectly to any firm or corporation whatsoever without the prior consent in writing of BBJ.

24. **INSPECTION OF WORKS**

Inspection & testing of work executed by the sub-contractor will be done by BBJ and/or Railway and/or their authorised representative and the sub-contractor is required to get the work passed through BBJ and/or Railway and/or their authorised representative.

25. **SAFETY AND ENVIRONMENT AT SITE/SHOP**

- a) The successful bidder shall strictly abide by all safety standards, specifications, practices, rules, and regulations in construction and also the instruction of our safety (EHS) Engineer. Any kind of unsafe action or unsafe method of work by The Successful bidder's workmen, which may lead to injury to the successful bidder's workmen, will be viewed seriously and a penalty for the same will be levied on the successful bidder for such unsafe actions.
- b) The successful bidder will be responsible for the safety of their staff and employees of other agencies working in the successful bidder's area of operation.
- c) The Successful bidder shall delegate the responsibility of implementation of safety rules to one of The Successful bidder's staff.
- d) All safety appliances required like safety helmets, safety belts, shoes, retro-reflective jackets and other Safety PPE, etc., shall be arranged by the successful bidder at The Successful bidder's cost.
- e) In the event of non-availability of such safety gadgets at the required point of time, we may, at the sole discretion of the Site in charge, procure such gadgets and issue the same to The Successful bidder on a chargeable basis on actual plus 20% overhead charges.
- f) The successful bidder's authorized representative shall attend all safety meetings convened by the site safety (EHS) Engineer and abide by his instructions and follow the site safety practices without failure.
- g) Night working: Utmost care shall be taken during night operations with proper illuminations and safety.
- h) Any other safety arrangement is recommended to be followed as per instruction of Railway.
- i) Further, the successful bidder should ensure compliance with COVID-19 protocols as applicable.

26. **LIQUIDATED DAMAGES**

The time for the execution of the work shall be deemed to be the essence of the contract and the works must be completed not later than the date(s) as specified in the contract.

If the contractor fails to complete the works within the time as specified in the contract for the reasons not attributable to the successful bidder, BBJ may, if satisfied, allow the contractor to complete the work for further extension of time without imposing LD.

If the successful bidder fails to complete the works within the time as specified in the contract for the reasons attributable to the successful bidder, BBJ allows, if satisfied that the works

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can be completed within a reasonable short time thereafter, the successful bidder for further extension of time. On such extension, BBJ will recover from the bills of the successful bidder, as agreed damages, a sum equivalent to ½ (half) of 1% of the contract value per week or part of the week of any supplied equipment/services not delivered within stipulated time period or total order value in the case where part delivery is of no use to the purchaser, subject to the maximum limit of 10% for contract value up to 2 (two) lakh and 5% for contract value above 2 (two) lakh.

For the purpose of this Clause, the contract value of the works shall be taken as the value of work as per contract agreement including any supplementary work order/contract agreement issued.

Provided further, that if BBJ is not satisfied that the works can be completed by the Successful bidder and in the event of failure on the part of the successful bidder to complete the work within the further extension of time allowed as aforesaid, BBJ shall be entitled to encash the successful bidder's Security Deposit and Performance Guarantee and also rescind the contract, whether or not actual damage is caused by such default.

27. **INDEMNITY**

Bidder shall indemnify BBJ against all claims & losses in respect of their contractual obligations in the event of non-compliance of any terms & conditions of this documents or contract agreement / statutory rules/ obligations/ laws/ taxes & duties etc.

28. **TERMINATION OF CONTRACT**

In the event, BBJ finds that the successful Bidder's progress is consistently below the accepted pace based on the program scheduled mentioned in this document or fixed by BBJ and/or if the quality of works being executed by the successful Bidder falls below the expected standards laid down by BBJ, in such cases, in the interest of timely and successful completion of the project and to maintain the high quality of work, BBJ reserve the right to delete the Scope of Work of the successful Bidder, or, the entire balance work to be taken away from the successful Bidder and BBJ shall be at liberty to get such works done/executed by any other Bidder/ agencies. Moreover, BBJ shall not be liable to pay any compensation or make good any damage/s or to affect any other payment to the present successful bidder for any ground whatsoever.

In the above event, the successful bidder shall be debarred from participating in the tender for executing the balance work. If the successful bidder is a JV or a Partnership firm, then every member/partner of such a firm shall be debarred from participating in the tender for the balance work in his/her individual capacity or as a partner of any other JV /partnership firm.

The defaulting successful bidder shall not be issued any completion certificate for the contract.

All the statutory obligations including maintaining all other relevant Statues, Laws/ Rules, Local Rules & Regulations/ Rules of Central/ Local Govt. bodies should abide & comply by the successful Bidder and any consequence comes out from the act or omission of the successful Bidder which can result in stoppage of work or the successful bidder fails to comply any of its respective Contractual obligation(s) within the stipulated time frame, in that event BBJ reserves the right to terminate the contract and to take any action against the successful Bidder (such as forfeiture of EMD/ Security Deposit, encashment of Performance Bank Guarantee, non-payment/ forfeiture of RA Bills etc.) and the decision of

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BBJ in this respect shall be final.

In the above situations, BBJ reserves the right to issue a notice in writing to that effect and if the successful bidder does not within seven days after the delivery to him of such notice proceed to make good his default in so far as the same is capable of being made good and carry on the work or comply with such directions as aforesaid of the entire satisfaction of the BBJ, then BBJ shall be entitled after giving 48 hours' notice in writing to rescind the contract as a whole or in part or parts (as may be specified in such notice) and after the expiry of 48 hours' notice, a final termination notice should be issued by BBJ.

29. **RESOLUTION OF DISPUTES AND ARBITRATION**

In case a dispute or difference of any kind whatsoever arises out of or relates to the Contract or ancillary/incidental as to the terms and conditions of it or relates to any matter for execution and/or performance of the contract, between the parties to the Contract, it is a term of the agreement by and between the parties herein that before invoking arbitration, the aggrieved party shall first & foremost refer the matter within sixty (60) days from the date of cause of action of the said dispute(s) or difference(s) arosed, to the Competent Authority of BBJ and the decision/recommendation/interpretation made by the said Competent Authority of BBJ shall be final & binding upon both the parties.

On the failure of the procedure prescribed above or if a party is dissatisfied with the decisions/recommendations aforesaid, and notwithstanding anything else contained elsewhere, the aggrieved party may by notice in writing to the Competent Authority of BBJ evince the intention to refer the disputes and differences that have arisen between the parties to Arbitration by the constitution of an Arbitral Tribunal. The Arbitral Tribunal shall consist of three arbitrators, one each to be nominated by the respective parties and the third to be appointed by the nominated arbitrators.

Pending submission of and/or decision on a dispute or difference as aforesaid or until the Arbitral Award is published, the parties (if the Contract is not terminated/ cancelled) shall continue to perform all of their obligations under this Agreement and the Contract, without prejudice to a final adjustment in accordance with such award.

The decision of the Arbitral Tribunal arrived at after hearing the parties shall be final and binding upon the parties. The Arbitration Proceedings shall be conducted in accordance with the Arbitration and Conciliation Act, 1996 or any statutory modifications or re-enactments thereof.

It is also agreed by the parties that the Arbitration Proceedings shall be conducted in the English language. The venue of Arbitration shall be Kolkata only and any proceedings arising out of this Agreement / Contract shall be subject to the jurisdiction of Courts at Kolkata.

While executing the work by the Bidder and/or after completion of the work and/ or till completion of the maintenance period as per order, a dispute or difference of any kind whatsoever arises out of or relates due to actions of the Railway and/ or the Bidder, the same will at first instance be settled amicably with the Railway through BBJ. In case amicable settlement cannot be reached and it is required to initiate arbitration proceeding by BBJ with the Railway, the Bidder will bear entire costs related to arbitration proceedings including legal expenses, incidental costs e.g. costs related to travelling, food & lodging of BBJ's representatives including BBJ's legal experts/ lawyers, costs of documentation etc.

In the event of any dispute and/or difference arises due to any non compliance/ default

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caused by the successful bidder and for that reason any litigation/ arbitration arises between the concerned Railway authority and BBJ for work related matters e.g. extra work done/ quantity variation & payment thereof, non-payment of bills, deletion/ modification of items, legal/ local/ state/ national statutory compliances (other than those, which are to be complied with by the Bidder as per BBJ's order) etc., the same will be forwarded to the concerned Railway authority by BBJ and necessary follow ups to be done by the Bidder. In case these issues are need to be settled through legal process (arbitration/ court cases etc.), cost involved in such legal processes will be borne by the Bidder till finalization of the process, irrespective of realization of the claims etc. Any payment in this regard, due to be paid to the Bidder, will be paid only after the realization of the same from the Railway authority.

30. **FORCE MAJEURE:**

If any time, during the continuance of this contract, the performance in whole or in part by either party under obligation as per this contract is prevented or delayed by reasons of any war or hostility, the act of the public enemy, civil commotion, sabotage, fire, flood, explosion, epidemic, quarantine restrictions, strike, lockout or acts of God (hereinafter referred to as "eventuality"), provided notice of happening of any such eventuality is given by either party to the other within 21 (Twenty) days of the date of occurrence thereof, neither party shall because of such an "eventuality" be entitled to terminate this contract nor shall either party have any claim or damages against the other in respect of such non-performance or delay in performance and deliveries under the contract. The contract shall be resumed as soon as practicable after such "eventuality" has come to an end or ceased to exist.

In case of any dispute, the decision of BBJ shall be final and conclusive, provided further that if the performance in whole or part of any obligation under this contract is prevented or delayed because of any such eventuality for a period exceeding 60 (Sixty) days, either party may at its options, terminate the contract.

Provided that if the contract is terminated under this clause, the Purchaser shall be at liberty to take over from the supplier at a price to be fixed by the purchaser, which shall be final, all unused, undamaged and acceptable equipment, bought out components and other stores in the course of manufacture which may be in the possession of the Supplier at the time of such termination, or such portion thereof as BBJ may deem fit except such equipment, as the Supplier may, with the concurrence of the Purchaser, elect to retain.

31. **NON-SCHEDULE ITEM OF WORK**

Settlement of rate of the extra item(s) of work which is/are not covered by the schedule:

The successful bidder shall notify any extra item(s) of work to BBJ immediately after he comes across the same during the execution of work and submits the rate for the same. Based on merit, BBJ shall take up with RAILWAY for settlement of the rate of the extra item(s) of work. If RAILWAY admits the said extra item(s) of work and settles the rate thereof then BBJ shall also admit the said extra item of work for the successful bidder and pass on 90% of the rate settled by RAILWAY.

32. **IMPORTANT NOTES:**

BBJ reserves the right to:

- i) Accept or reject any bid received at its discretion without assigning any reasons whatsoever.
- ii) Increase/ decrease/ alter the job description/ scope of work with the corresponding change in the value of the contract.

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- iii) Postpone or extend the above-mentioned date, split and distribute the work among more than one bidder without assigning any reason whatsoever.
- iv) May ask for further qualification during techno commercial scrutiny of bids received.
- vi) BBJ shall not be liable for any expenses incurred by the bidder for delivery of materials or during the preparation of the bid irrespective of whether it is accepted or not.
- vii) Canvassing i.e., soliciting favour, seeking advantage etc. in any form is strictly prohibited and any bidder found to have engaged in canvassing shall be liable to have his bid rejected summarily.
- viii) If the bidder deliberately gives any wrong information in his tender to create circumstances for the acceptance to his bid, BBJ reserves the right to reject such application.

(पार्थ नंदी / PARTHA NANDY)
मुख्य प्रबंधक (परियोजना) / CHIEF MANAGER (PROJECT)

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ANNEXURE-I

FORMAT

CERTIFICATE

(TO BE SUBMITTED ON BIDDER'S LETTER HEAD)

REF.:

DATE:

SUB: **DEPLOYMENT OF WORKMEN FOR THE WORK AT UTTAR PRADESH STATE**

This is to certify that we have complied with all the Statutory Obligation for our workmen engaged for the subject work which includes payment of Minimum Wages, P.F. & E.S.I. contribution and other benefits as per prevailing Labour Laws and other Statutes/Rules in the State of UTTAR PRADESH.

We hereby indemnify our employer THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION CO. LTD. regarding compliance of all statutory requirement of Labour Laws as stated above. THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION CO. LTD. will have no responsibility in this regard.

(Authorized Signatory)
Signature with Office Seal

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Annexure-A

DECLARATION BY AUTHORISED SIGNATORY OF BIDDER

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

To,

(Write Name and Designation of Officer of BBJ inviting the Tender)
The Braithwaite Burn And Jessop Construction Co. Ltd.
(A Government of India Enterprise)
27, Rajendra Nath Mukherjee Road,
Kolkata – 700001

Dear Sir,

Sub: Declaration by Authorized Signatory regarding Authenticity of submitted documents.

Ref: 1) NIT/Tender Enquiry No. & Date:
2) All other pertinent issues till date

I/We, hereby certify that all the documents submitted by us in support of possession of "Qualifying Requirements" are true copies of the original and are fully compliant required for qualifying / applying in the bid and shall produce the original of same as and when required by The Braithwaite Burn And Jessop Construction Co. Ltd.

I / We hereby further confirm that no tampering is done with documents submitted in support of our qualification as bidder. I / We understand that at any stage (during bidding process or while executing the awarded works) if it is found that fake / false / forged bid qualifying / supporting documents / certificates were submitted, it would lead to summarily rejection of our bid / termination of contract. BBJ shall be at liberty to initiate other appropriate actions as per the terms of the Bid / Contract and other extant policies of The Braithwaite Burn And Jessop Construction Co. Ltd.

Yours faithfully,

(Signature, Date & Seal of Authorized Signatory of the Bidder)

Date: