(A Government of India Enterprise)
27, RAJENDRA NATH MUKHERJEE ROAD
KOLKATA - 700 001 (WEST BENGAL)
PHONE NO. (033) 2248 5841-44; FAX: (033) 2210 3961
E-MAIL: info@bbjconst.com, Website: www.bbjconst.com

1	TENDER NO.	**eNIT/DGM(P-V)/BRIDGES/MIZORAM/2150/3131/41-2019 Date: 20.06.2019**
2	NAME OF WORK	SUPPLYING, FABRICATION, ASSEMBLING AND ERECTION OF STEEL THROUGH GIRDERS/ PLATE GIRDERS/ COMPOSITE GIRDERS FOR 03 NOS MAJOR BRIDGES HAVING TOTAL 12 SPANS [BRIDGE NO 78 (78.8M X 6 NOS), BRIDGE NO 167-168 (78.8M X 6 NOS)], INCLUDING METALIZING OF MEMBERS, FITTING & FIXING OF BEARINGS, FITTING OF CHANNEL SLEEPERS/ H-BEAM SLEEPERS, TRACK LINKING, PAINTING AND OTHER ANCILLIARY WORKS IN BETWEEN STATIONS BAIRABI AND SAIRANG IN CONNECTION WITH THE CONSTRUCTION OF NEW BG RAILWAY LINE FROM BAIRABI TO SAIRANG (MIZORAM)
3	COMPLETION PERIOD	**12 (Twelve) Months**
4	APPROX. VALUE OF THE WORK (TENDER VALUE)	**Rs.125,09,35,771.00**
5	COST OF TENDER DOCUMENT (NON-REFUNDABLE)	**Rs.10,000/-** (Rupees ten thousand only) by Demand Draft/ Banker's Cheque/ NEFT/ RTGS in favour of "**THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED**" payable at Kolkata. MSME/ NSIC/ SSI units will be waived from submitting tender fee subject to submission of declaration of UDYOG AADHAR MEMORANDUM (UAM) number on CPPP.
6	EARNEST MONEY DEPOSIT	**Rs.20,00,000/-** (Rupees twenty lakh only) by Demand Draft/ Banker's Cheque/ NEFT/ RTGS in favour of "**THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED**" payable at Kolkata. MSME/ NSIC/ SSI units will be waived from submitting EMD subject to submission of declaration of UDYOG AADHAR MEMORANDUM (UAM) number on CPPP. Existing contractors working with BBJ may adjust the EMD from their pending bills.
07.	MODE OF SUBMISSION	Online through e-Procurement of CPPP, NIC

08.	Date & Time Schedule:	Date of Publishing NIT & Tender Documents	**21.06.2019**
		Document download Start Date	**21.06.2019 at 10:00 Hrs**
		Start Date of uploading of bid document	**05.07.2019 at 10:00 Hrs**
		End Date for uploading of bid document	**11.07.2019 at 15:00 Hrs**
		Date of opening of Technical Bid	**12.07.2019 at 15:00 Hrs**
		Date of opening of Financial Bid	**To be notified later**

(A Neogi)
DGM(P-V)

TWO PACKET SYSTEMS TENDER

PART – I

TECHNICAL BID DOCUMENT

Part I: - Tender Document (Technical Bid Document)

SECTION-I

TENDER NOTICE

SECTION-I

1. BBJ, Kolkata invites sealed open etenders on **Two Packet System** on prescribed forms for the under noted work:

NAME OF WORK:	SUPPLYING, FABRICATION, ASSEMBLING AND ERECTION OF STEEL THROUGH GIRDERS/ PLATE GIRDERS/ COMPOSITE GIRDERS FOR 03 NOS MAJOR BRIDGES HAVING TOTAL 12 SPANS [BRIDGE NO 78 (78.8M X 6 NOS), BRIDGE NO 167-168 (78.8M X 6 NOS)], INCLUDING METALIZING OF MEMBERS, FITTING & FIXING OF BEARINGS, FITTING OF CHANNEL SLEEPERS/ H-BEAM SLEEPERS, TRACK LINKING, PAINTING AND OTHER ANCILLIARY WORKS IN BETWEEN STATIONS BAIRABI AND SAIRANG IN CONNECTION WITH THE CONSTRUCTION OF NEW BG RAILWAY LINE FROM BAIRABI TO SAIRANG (MIZORAM)
APPROX COST OF THE WORK (TENDER VALUE)	**Rs.125,09,35,771.00**
EARNEST MONEY TO BE DEPOSITED.	**Rs.20,00,000/-** (Rupees twenty lakh only) by Demand Draft/ Banker's Cheque/ NEFT/ RTGS in favour of "**THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED**" payable at Kolkata. MSME/ NSIC/ SSI units will be waived from submitting EMD subject to submission of declaration of UDYOG AADHAR MEMORANDUM (UAM) number on CPPP. Existing contractors working with BBJ may adjust the EMD from their pending bills.
COMPLETION PERIOD OF THE WORK	**12 (Twelve)** Months
COST OF TENDER FORM (DOCUMENT) – NON REFUNDABLE	**Rs.10,000/-** (Rupees ten thousand only) by Demand Draft/ Banker's Cheque/ NEFT/ RTGS in favour of "**THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED**" payable at Kolkata. MSME/ NSIC/ SSI units will be waived from submitting tender fee subject to submission of declaration of UDYOG AADHAR MEMORANDUM (UAM) number on CPPP.
MODE OF SUBMISSION	Online through e-Procurement of CPPP, NIC

Date & Time Schedule:	Date of Publishing NIT & Tender Documents	**21.06.2019**
	Document download Start Date	**21.06.2019 at 10:00 Hrs**
	Start Date of uploading of bid document	**05.07.2019 at 10:00 Hrs**
	End Date for uploading of bid document	**11.07.2019 at 15:00 Hrs**
	Date of opening of Technical Bid	**12.07.2019 at 15:00 Hrs**
	Date of opening of Financial Bid	**To be notified later**
VALIDITY OF OFFER:	**120 DAYS** FROM THE DATE OF OPENING OF TENDER.	
SITE VISIT	IT IS DEEMED THAT THE TENDERER HAS ACQUAINTED HIMSELF WITH THE SITE CONDITION THOROUGHLY AFTER SITE VISIT AND QUOTED HIS RATE TAKING INTO CONSIDERATION ALL THE ASPECTS. ANY PLEA REGARDING IGNORANCE ABOUT SITE CONDITION SHALL NOT BE ENTERTAINED.	

Note:

i) **TENDER WITH OUT EARNEST MONEY WILL BE SUMMARILY REJECTED.**

A. Eligibility Criteria

1. Average Annual financial turnover during last 3 years, ending 31st March of the previous financial year, should be at least **150%** of the estimated cost.
2. Experience of having successfully completed similar works during last 7 years ending last day of the month previous to the one in which applications are invited should be either of the following:-
   a. Three similar completed works costing not less than the amount equal to **40%** of the estimated cost

   Or

   b. Two similar completed works costing not less than the amount equal to **50%** of the estimate cost

   Or

   c. One similar completed work costing not less than the amount equal to **80%** of the estimated cost

3. Definition of Similar work is mentioned below.

Similar Work: Civil Engineering work inclusive of Supply, Fabrication and Erection of **steel structure**. Value of the work should be as per value mentioned in eligibility criteria above.

B. Additional Technical Criteria:

a. Completed at least one single work of supply, fabrication & erection of minimum 61M span open-web welded steel girder within the qualifying period and erection of at least one Railway Bridge Girder of any span of minimum Pier height of 40m by cantilever launching method.

b. The tenderer(s) must have experience of successful completion of large civil project in North Eastern Region of India.

c. Should have RDSO approved workshop complying the latest Schedule of Technical Requirement (STR) of RDSO, which should be well equipped and capable of delivering the fabricated girders within stipulated time.

d. Should have RDSO approved workshop complying the latest Schedule of Technical Requirement (STR) of RDSO, which should be well equipped and capable of delivering the fabricated girders within stipulated time.

C. AVAILABILITY OF BID CAPACITY =
(AxNx2.0 – 0.25xNxB), should be more than the total estimated price where,

A= Maximum value of works executed in any one year during the last **3 years** which will take into account the completed as well as works in progress (total contract receipts)

B= Total value of existing commitments irrespective of the completion period of those works (in case bidder or partner of JV has existing commitment through another JV, then the commitment will be taken in proportion to the share of the Bidder in the JV).

N= Number of years prescribed for completion of works in the present bid.

NB:
(1) Number of bridge tenders is being called at the same time. Award of one or more than one package to the same agency shall be evaluated based on the capacity & credentials of the tenderer.
(2) The Tenderer(s) shall furnish the details of existing commitments as per the prescribed proforma along with Technical Bid Document (i.e. Part-I document) for 'Statement of works in progress' and also 'Statement of works abandoned/left incomplete'.

D. Sufficient number of Tools & Plants required for execution of work and numbers of key personnel (Technical) to be deployed by the Contractor as indicated in the Tender document. Otherwise action will be taken as per Tender condition.

2. The complete etender document consists of two parts i.e. **Part-I (Technical Bid document) & Part-II (Price Bid document).** After signing the tender documents, they should be separately sealed in two different envelopes superscribed as **Packet-I (Technical Bid) and Packet-II (Price Bid)** along with name of work, the Tender No. and these two envelopes should be sealed in a larger envelope super scribing the name of work & Tender No.

3. JOINT VENTURE will be permitted in this Tender.

4. PARTNERSHIP FIRM: In case the tenderer is a partnership firm, the work experience, solvency and turn over shall be in the name of partnership firm only.

5. VALIDITY OF TENDER = **120 (one hundred twenty) days** from the date of opening of Tender.

6. The tender documents can be downloaded from **https://eprocure.gov.in/eprocure**.

7. (a) The tender documents will also be available in the web site **www.bbjconst.com** during the above mentioned period and same can be downloaded. **However, the Demand Draft for Rs.10,000/- towards cost of tender documents as stated above will have to be enclosed while submitting the tender and a scanned copy to be uploaded in the etender portal. Otherwise, the tender will be summarily rejected.**
(b) **The Earnest Money Deposit and the cost of Tender paper should be submitted along with the Technical Bid (Part-I) and a scanned copy to uploaded in the etender portal, otherwise Tender will be treated as without Earnest Money Deposit.**
(c) BBJ Administration will not be responsible for any delay/ difficulties/ inaccessibility of the downloading facility for any reason whatsoever. In case of any discrepancy between the tender documents downloaded from internet and the master copy available in the offices mentioned in **(7)** above, the latter shall prevail and will be binding on the tenderer(s). No claim on this account will be entertained.
(d) The tenderer/s sould make their own arrangement for the site visit.

8. **Earnest Money shall have to be deposited by all tenderers. Tenders not accompanied by requisite Earnest Money shall be summarily rejected. The tenderer should furnish the details of postal address with PIN Code along with FAX No. of concerned bank from which EMD purchased.**

9. All documents being submitted by the tenderer(s) along with their offer shall have to be self-attested failing which, document not bearing self attested signature of the tenderer, will be treated null and void and will not be taken into consideration while deciding the tender.

10. Tenderer(s) should submit the following details with tender documents:

(a) List of Personnel available on hand and proposed to be engaged for the subject work.
(b) List of Plant & Machinery available on hand (own) and proposed to be inducted (owned and hired to be given separately) for the subject work.
(c) List of works completed in the last seven financial years giving description of work, organization for whom executed, approximate value of contract at the time of award, date of award and date of scheduled completion of work, date of actual start and actual completion of the work and final value of contract/ final payment made to the contractor.
(d) List of works on hand indicating description of work, date of award, contract value, and approximate value of balance work yet to be done.

Notes: (i) In case of items (a) and (d) above, supportive documents/certificates from the Organizations with whom they worked/are working should be enclosed. (ii)Certificates from private individuals for whom such works are executed/ being executed will not be accepted.
(iii)Tenderer(s) are advised to submit those documents, which clearly show the fulfillment of Eligibility Criteria.

11.0 The tenderer has to give name and contact numbers of key personnel's fully and clearly in the box provided above.

12.0 **Submission of Tender:** (Regulations for guideline of tenderers) The complete tender document upload in **https://eprocure.gov.in/eprocure** and hardcopy should be submitted in BBJ-Kolkata office.

SECTION – II

DECLARATION FROM TENDERERS

CHAPTER-II

(TENDER FORM FIRST SHEET)

Issued to: -

TENDER NO: eNIT/DGM(P-V)/BRIDGES/MIZORAM/2150/3131/xx-2019

Name of work: SUPPLYING, FABRICATION, ASSEMBLING AND ERECTION OF STEEL THROUGH GIRDERS/PLATE GIRDERS/COMPOSITE GIRDERS FOR 03 NOS MAJOR BRIDGES HAVING TOTAL 12 SPANS [i.e BRIDGE NO 78 (78.8M X 6 NOS), BRIDGE NO 167-168 (78.8M X 6 NOS)] INCLUDING METALIZING OF MEMBERS, FITTING & FIXING OF BEARINGS, FITTING OF CHANNEL SLEEPERS/ H-BEAM SLEEPERS, TRACK LINKING, PAINTING AND OTHER ANCILLIARY WORKS IN BETWEEN STATIONS BAIRABI AND SAIRANG IN CONNECTION WITH THE CONSTRUCTION OF NEW BG RAILWAY LINE FROM BAIRABI TO SAIRANG (MIZORAM)

Approx. Value (Tender Value) **= Rs.125,09,35,771.00**

TO
THE BRAITHWAITE BURN & JESSOP CONSTRUCTION COMPANY LIMITED
27, RAJENDRA NATH MUKHERJEE ROAD,
KOLKATA – 700001

1. I/We ..... have read the various conditions to tender attached here to and hereby agree to abide by the said conditions. I/We also agree to keep this tender open for acceptance for a period of 120 days from the date fixed for opening the same and in default thereof. I/We will be liable for forfeiture of my/our "Earnest Money". I/We offer to do the work at the rates quoted in the attached Schedules and hereby bind myself/ourselves to complete the work in all respects within **12 (twelve) months** from the date of issue of letter of acceptance of the tender.
2. I/We .....also hereby agree to abide by the (i) Railway General Conditions of Contracts and Standard Special Conditions of Contracts, 1998 (ii) **Unified Standard Specification works & materials 2010** (iii) Special Conditions and Specifications attached with the tender & (iv) United Schedule of Rates (for Works and Materials) of Railway, 2010 edition corrected up to date.
3. A sum of **Rs. 20,00,000.00** is hereby forwarded as earnest money. The full value of the earnest money shall stand forfeited without prejudice to any other rights or remedies, if:
   (a) I/We do not execute the contract, within Seven days after receipt of notice issued by the BBJ that such documents are ready, or (b) I/We do not commence the work within Ten days after receipt of the orders to this effect (c) I/We withdraw or modify my/our offer within the validity date of the tender.
4. Once the acceptance of the tender is communicated to us a legal and enforceable contract comes in to being. If in accordance with the letter of the acceptance I/We fail to commence work within the period stipulated in the acceptance letter and fail to execute the formal agreement, I/We shall be liable for breach of the contract and the consequences of breach of any of the conditions of the contract shall entitle BBJ Administration to have work/job executed at my/our risk and cost and to claim extra cost/expenditure sustained by the BBJ Administration.

Signature of Witnesses

1. Address

2 Address

SECTION-III

SCOPE OF WORK & SALIENT FEATURES

CHAPTER-III

SALIENT FEATURES:

Name of work:

SUPPLYING, FABRICATION, ASSEMBLING AND ERECTION OF STEEL THROUGH GIRDERS/PLATE GIRDERS/COMPOSITE GIRDERS FOR 03 NOS MAJOR BRIDGES HAVING TOTAL 12 SPANS [i.e BRIDGE NO 78 (78.8M X 6 NOS), BRIDGE NO 167-168 (78.8M X 6 NOS)] INCLUDING METALIZING OF MEMBERS, FITTING & FIXING OF BEARINGS, FITTING OF CHANNEL SLEEPERS/ H-BEAM SLEEPERS, TRACK LINKING, PAINTING AND OTHER ANCILLIARY WORKS IN BETWEEN STATIONS BAIRABI AND SAIRANG IN CONNECTION WITH THE CONSTRUCTION OF NEW BG RAILWAY LINE FROM BAIRABI TO SAIRANG (MIZORAM)

NATURE & SCOPE OF WORK:

1.0 SCHEDULE-A: (Item no. 1)
(Execution of NS item of works) – Supplying of all type of structural steel, fabrication, transportation, trial assembly, assembly, erection/ slewing/ end launching of steel girders etc.

2.0 SCHEDULE-B: (Item no. 2)
(Execution of USSOR items of works) – Erecting roof trusses, tank staging etc.

3.0 SCHEDULE-C: (Item no. 3)
(Execution of NS item of works) – Carrying out Ultrasonic test etc.

4.0 SCHEDULE-D: (Item no. 4)
(Execution of NS item of works) – Fixing of galvanized H-beam sleepers etc.

5.0 SCHEDULE-E: (Item no. 5)
(USSOR items of works) – Any other item of work not included in Sch- A-J, but reqd. to be executed for successful.

6.0 SCHEDULE-F: (Item no. 6)
(USSOR items of works) – Earthwork in cutting in formation. Trolley Refuge, etc.

7.0 SCHEDULE-G: (Item no. 7)
(USSOR items of works) – Felling of trees of girth.

8.0 SCHEDULE-H: (Item no. 8)
(USSOR items of works) – Earthwork in filling in embankment.

9.0 SCHEDULE-I: (Item no. 9)
(USSOR items of works) – Supplying of Structural Steel to Fe410B, etc.

The details of items of works to be executed are specified in schedule of items and **Annexure-I to IX** enclosed.

- The contract envisages all permanent and temporary works which are necessary for the efficient execution and completion of works.
- The information and data stated herein and to be incorporated in contracts elsewhere is for the general guidance only and is subject to vary with more detailed site investigation.

Note:

The contractor has to arrange all materials, tools, tackles, machineries, cranes, consumables etc. whatever required for the work.

CHECK LIST TO BE SUBMITTED BY THE TENDERER:-

DESCRIPTION	REMARKS
COST OF TENDER DOCUMENT EARNEST MONEY DEPOSIT	TO BE MADE AS STATED ABOVE
EFT FORM	FORM NO.1
TECHNICAL CREDENTIAL	FORM NO.2
FINANCIAL CREDENTIAL	FORM NO.3
LIST OF PLANT & MACHINERIES	FORM NO.4
LIST OF TECHNICAL MANPOWER	FORM NO.5
LIST OF WORK COMPLETED DURING LAST 7 YEARS	FORM NO.6
LIST OF WORKS IN HAND	FORM NO.7
LIST OF COURT & ARBITRATION CASES PENDING	FORM NO.8
ORGANISATION CHART	TO BE SUBMITTED/ ATTACHED
PLANNING OF EXECUTION	TO BE SUBMITTED/ ATTACHED
COVERING LETTER	TO BE SUBMITTED/ ATTACHED
POWER OF ATTORNEY	TO BE SUBMITTED/ ATTACHED
SIGNATURE AT EACH PAGE	TO BE DONE
ATTESTATION OF CREDENTIALS	REQUIRED BEFORE UPLOADING
SUBMISSION OF ALL RATES IN FIGURES & WORDS	FORM NO.10
FULL COMMUNICATION ADDRESS WITH MOBILE NO OF CONTACT PERSON	FORM NO.9
DOCUMENTS RELATED TO CONSTITUTION OF AGENCY (Whether Proprietor, Partnership, Joint Venture, Company etc.)	TO BE SUBMITTED/ATTACHED

SECTION – IV

INSTRUCTION TO TENDERER

SECTION-IV

(TENDER FORM SECOND SHEET)

Regulations for the Guidance of Tenderers

1.0 THE FOLLOWING DOCUMENTS SHALL FORM PART OF THE CONTRACT: -

(a) Tender document.
(b) General Conditions of Contracts and Standard Special Conditions of Contracts, 2013 (ii) Indian Railway Unified Standard Specification Volume I & II 2010 edition and USSOR Schedule of Rates (for Labours and Materials) of Northeast Frontier Railway, 2010 edition corrected up to date.
(c) Additional Special Conditions of Contract.
(d) Special Conditions and Special Specifications for the work.
(e) Schedule of items and Approximate Quantities and Abstract of Schedule of items of works and estimated cost.
(f) Agreement forms.
(g) Indian Railway Engg. Code 1999 latest Revised Edition.

2.0 INSTRUCTIONS TO TENDERER(S)

2.1 REGISTRATION OF CONTRACTOR

Any contractor 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.

2.2 DIGITAL SIGNATURE CERTIFICATE (DSC)

Each contractor 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 Information's Centre (NIC) on payment of requisite amount details are available at the Web Site stated in Clause 2 of Guideline to bidder DSC is given as a USB e-Token.

2.3 SUBMISSION OF BID:

Bids to be submitted online through e-Procurement system of CPPP. A hardcopy of the submitted bid shall have to be submitted to this office. Tender document to be digitally signed with Company's seal by the bidders. The rates in the appropriate space in the **BOQ** should be properly filled in.

i. Each and every page of the tender documents (purchased/ downloaded) is to be signed by the tenderer/s under seal of the participating firm/tenderer before submission.
ii. Incomplete tenders are liable to be rejected without further correspondence.
iii. Earnest Money shall be deposited by the tenderer/s alongwith Part-I (Technical Bid) document only. Tender not accompanied by the requisite Earnest Money shall be summarily rejected.
iv. General Conditions of Contract, Standard Special Conditions of Contract, 1998 and (iii) Indian Railway Unified Standard Specification Volume I & II 2010 edition and USSOR Schedule of Rates (for Labours and Materials) of Northeast Frontier Railway, 2010 edition corrected up to date can be seen in the office of the BBJ or can be had on payment, if available.
v. The Tenderer(s)/Contractor(s) have to quote rates in figures and words/percentage above/ below/ at par rate only in the schedule. The quantities in schedule of items of work are given in **Annexure - I to IX** as a guide and are approximate only and are subject to variation according to the need during execution of the work. BBJ accepts no

responsibility for the accuracy. BBJ does not guarantee work under the items of the schedule.

vi. The Schedule of quantities is issued in duplicate with the object of avoiding addition, alteration, overwriting and crossings etc. and to ensure submission of a fair copy, which should bear no such blemish. Only one copy of the Tender Schedule is to be submitted by the Tenderer(s).

vii. All documents and entries in the tender shall be either type written or in ink and in English. Tender containing erasures, additions and alterations to the tender documents are liable to be rejected. Any correction made by the Tenderer(s) in his entries must be attested by him. If rates expressed in figures and words do not agree, then the lower of the two rates will be taken into consideration and binding on the contractor.

viii. Rates should be quoted inclusive of all but excluding GST that will be extra as applicable.

ix. BBJ will disqualify tenderer(s), if they have made misleading or false representation in the form, statements and attachments submitted; or indulges in fraudulent and corrupt practice. “Corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the tendering process or in contract execution; and “Fraudulent practice” means a misrepresentation of facts in order to influence and evaluation process or the execution of a contract, and includes collusive practices among Tenderers (prior to or after Tender submission) designed to establish bid prices at artificial, non-competitive levels and to deprive the client’s free and open competitions.

x. Further BBJ may declare a Tenderer ineligible, for any BBJ contract if it at any time determines that the Tenderer has engaged in corrupt or fraudulent practices in completing for, or in executing, a borrowed financed contract in general; or defines, for the purpose of this provision, the terms set forth below as follows:

(a) Records of poor performance during the last 7 years, as on the date of submission of tender such as abandoning the work, rescinding of contract for which the reasons are attributable to the non-performance of the contractor.

(b) Inordinate delays in completion, consistent history of litigation awarded against the tenderer/contractor or any of its constituents or financial failure due to bankruptcy, etc. If the Contractor has worked in a Joint Venture, the rescinding of contract of a Joint Venture on account of reasons other than non-performance, such as Most Experienced Partner (Lead Partner) of Joint Venture pulling out.

Or

(c) Been debarred (blacklisted) by any Government agencies as on the date of application.

The Technical Commercial Part should contain the following documents, which to be submitted/ upload with the offer:

(a) Tender Document Fee amounting to **Rs.10,000/-** (Rupees ten thousand only) in the form of Demand Draft/Banker’s Cheque/NEFT/RTGS drawn in favour of “The Braithwaite Burn And Jessop Construction Company Ltd.”, payable at Kolkata. Scanned copy to be uploaded in portal and instrument to be submitted physically along with other documents.

(b) EMD amounting to **Rs.20,00,000/-** (Rupees twenty lakh only) in the form of Demand Draft/Banker’s Cheque/NEFT/RTGS drawn in favour of “The Braithwaite Burn And Jessop Construction Company Ltd.”, payable at Kolkata. Scanned copy to be uploaded in portal and instrument to be submitted physically along with other documents.

The Techno Commercial Part should also contain the following documents, which to be submitted/ upload with the offer

(a) GST Registration Certificate

(b) Copy of PAN CARD

(c) ESI Registration
(d) Copy of PF Registration Certificate
(e) Digitally signed copy of tender documents of BBJ
(f) Audited Balance Sheet & P/L for last 03 (three) financial years
(g) Copy of relevant documents/ experience certificate showing past experience as per Eligibility Criteria.

3. DECLARATION TO BE GIVEN BY THE TENDERER(S)

I/We _____ declare that

(a) We have examined and have no reservations to the Tender documents, including Addenda issued.
(b) We offer to execute the Works in conformity with the Tender Documents;
(c) If our tender is accepted, we commit to submit Security Deposit and Performance Guarantee in accordance with the tender Document within the time fixed;
(d) If our tender is accepted, we commit to deploy minimum key personnel and equipments consistent with the stipulation in the Tender Document.
(e) If our Tender is accepted, we commit to submit work method statements for all major activities and get these approved from the engineer prior to commencing work on such activities. We also understand that the work shall be executed as per the approved method statements without any deviations;
(f) If our tender is accepted, we commit to establish Testing Laboratory at the site of work with minimum Testing equipments indicated in the Tender Document.
(g) I/We am/are not banned from doing business with Railways or any other Ministry/ Department of the Govt. of India /State Govt. from participation in tenders/ contract on the date of opening of bids either in individual capacity or the JV firm or partnership firm in which we were/are members / partners.
(h) I/We are not sister concerns/allied partners who were individuals or firms or partners of firms banned from doing business with Railways.
(i) I/We understand and agree that if I/We were found during consideration of the tender to be a firm/individual or sister/allied concern or any individual or firms or partner of firms banned by the Ministry of Railway or any other Ministry/ Govt. Department from doing business and ban is still in force, Earnest money deposit remitted by me/us will be forfeited in full.
(j) I/We understand that if I/We were found during the course of execution of work to be an individual or firm or partner or firms or sister/allied concern of any individuals or firms banned by the Ministry of Railway or any other Ministry/ Govt. Department from doing business and the ban is still in force, my/our security deposit and Performance Guarantee will be forfeited in full.
(k) I/We understand that if I/We are found to be individual or firm or partner of firm or sister/ allied concern of any individuals or firms banned by the Ministry of Railways or any other Ministry/Govt. Department from doing business during the consideration of tender or during the execution of work, I/We are liable to be banned from doing business for further periods to be specified by BBJ.
(l) I/We are satisfying the eligibility conditions mentioned in the tender and I/We have enclosed attested copies of documents along with the tender in support of my/our claim of satisfying eligibility conditions. I/We understand that I/We have to produce the original documents if so demanded by the BBJ. I/We understand that if any of the documents were found to be bogus, my/our earnest money deposit (before finalization of tender) security deposit (after awarding work) will be forfeited in full and I/We are liable to be banned from doing business with BBJ for any period to be specified by the BBJ and also liable for legal proceedings against me/us.
(m) I/We have submitted full details of work on hand and progress thereon. I/We

understand that if the information furnished by me/us were found to be false my/our tender is liable to be rejected and Earnest money deposit in full is liable to be forfeited. If it is found to be false at any stage, I/We are liable to be banned from doing business with BBJ for any period to be specified by BBJ and also liable for legal proceedings against me/us.

(n) We have not made any tempering or changes in the Bidding Documents on which the Bid is being submitted and if any tampering or changes are detected at any stage, we understand that the Bid will summarily rejected and forfeiture of Bid Security / the contract will be liable to be terminated along with forfeiture of full amount of performance security, even if LOA/WO has been issued; and

(o) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(p) I/we are not sister concerns/allied partners of firm's, who have been found guilty in any criminal case in the past.

Name .....

In the capacity of .....

Signed .....

Duly authorized to sign the Bid for and on behalf of .....

Date .....

SIGNATURE & ADDRESS OF WITNESSES TO THE SIGNATURE OF THE TENDERER(S)

WITNESSES :

1. Name Signature

Address Date

2. Name Signature

Address Date

4. **SIGNING OF TENDERS**

4.1 The tenderer/Contractor shall sign each and every page of the Tender document.

4.2 Any individual/s signing the Tender or other documents connected therewith should specify whether he is signing:

(i) As Sole Proprietor of the concern or his Attorney,or

(ii) As a Partner or Partners of the Firm,or

(iii) For the Firm per procuration, or

(iv) As a Director, Manager or Secretary in the case of Limited Company.

4.3 In the case of firms not registered under the Indian Partnership Act all the partners, or the attorney duly authorised by all of them should sign the tender and all other connected documents. The original document empowering the individual or individuals to sign, the original partnership deed with registration certificates, if any, in case the tenderer(s) is a firm and the Memorandum and Articles of

Association in case the tenderer(s) is a Company should be furnished to the purchaser for verification if required.

5.0 EARNEST MONEY

5.1 The tenderer(s) is required to deposit **Rs.20,00,000/-** only as Earnest Money for the performance of the tender who will keep the offer open for a period of **120 days** from the date fixed for opening of tender, it being clearly understood that the tenderer(s) after submitting his tender will not resile from his offer or modify the rates, items and conditions thereof, failing which the aforesaid amount shall be liable to be forfeited by the BBJ.

5.2 The earnest money should be in Banker's Cheques/ Demand Drafts/ NEFT/ RTGS in favour of –"THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED", executed by any of the Nationalized Banks or by a Scheduled Bank.

5.3 Pay Orders or Demand Draft from any of the Nationalized Banks or a Schedule Banks should be drawn in favour of "**THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED**" and endorsed "Account Payee" and valid at least upto the validity of tender offer. No conformation advice from the Reserve Bank of India will be necessary.

5.4 **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 – 700 001 (W.B.)
Bank Account No.:	11175160292
Bank Account Type:	Current
IFSC Code:	SBIN0001401

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

5.5 **A tender not accompanied with requisite earnest money, in the requisite manner as aforesaid, will be summarily rejected.**

5.6 Earnest money shall not be acceptable in the shape of Bank Guarantee Bond.

(a) If any of these instruments are found to have been drawn in favour of/payable to the tenderer, they would be invalid and the tender submitted would be summarily rejected.

(b) The name of the tenderer (party), on whose account the D.D. has been issued, is to be mentioned by the Banker, at an appropriate place on the instrument itself.

(c) Government securities (Stock Certificates, Bearer Bonds, Promissory Notes etc.) and Guarantee bonds executed by banks will not be accepted towards earnest money.

5.7 In the event of tenderer(s) defaulting by not adhering to the conditions laid down in para 5.1, the BBJ Administration shall be entitled to forfeit the full amount of earnest money deposited along the tender without prejudice to any other remedy available to the BBJ.

5.8 No interest will be paid on earnest money. The earnest money will be refunded to the unsuccessful tenderer(s) within a reasonable period of time. The earnest money deposited by the successful tenderer(s) will be retained towards the security deposit for the due and faithful fulfillment of the contract but shall be forfeited if the contractor fails to execute the agreement or start the work within time schedule determined by the Engineer after notification of the acceptance of his/their tender.

5.9 BBJ shall be entitled to forfeit the earnest money specified for the particular work if the tenderer(s) fails/fail to execute the agreement or start the work within schedule time.

6.0 **CREDENTIALS**

6.1 The tenderer(s) is/are required to submit along with his/their tender, authenticated documents and certified details in support of their credentials and proof of their capacity to be able to undertake this work as per Annexure-A duly signed by the tenderer(s) himself/themselves also. It may please be understood that in the event of furnishing incomplete information or no information at all, BBJ reserves the right to reject the offer outright, without making any reference to the tenderer(s).

6.2 Non-compliance with any conditions mentioned above is liable to result in the tender being rejected.

7.0 **ACCEPTANCE OF TENDER**

7.1 BBJ does not bind itself to accept the lowest or any other tender nor does undertake to assign reasons for declining to consider any particular tender or tenders. No tenderer(s) shall demand any explanation on the cause of rejection of his/their tender. No correspondence will be entertained with the tenderer(s) in respect of the rejection of any or all tenders.

7.2 Tender documents submitted by the tenderer(s) shall become the property of BBJ and the BBJ shall have no obligation to return the same. The cost of Tender Document is not refundable.

7.3 If the tenderer(s) deliberately gives wrong information in his tender the BBJ reserves the right to reject such tender at any stage.

7.4 If a tenderer(s) expires after the submission of his tender or after the acceptance of his tender, the BBJ shall deem such tender as cancelled. If a partner of tendering firm expires after the submission of or after acceptance of their tender the BBJ shall consider such tender as cancelled unless the firm retains its character.

7.5 The accepting authority reserves the right to divide the tender amongst more than one tenderers, if deemed necessary, and also to reject any or all tenders received without assigning any reason and does not bind himself to accept the lowest or any other tender.

8.0 EXECUTION OF CONTRACT DOCUMENT

8.1 The tenderer whose tender is accepted shall be required to appear in the office of the BBJ in person, or if a firm or corporation, a duly authorized representative shall so appear, to execute the contract documents within seven days after notice to do so. Failure to comply shall constitute a breach of the agreement effected by the acceptance of the tender in which case the full value of the earnest money accompanying the tender shall stand forfeited without prejudice to any other rights or remedies.

8.2 In the event of any tenderer, whose tender is accepted refusing to execute the contract documents as therein before provided, the BBJ may determine that such tenderer has abandoned the contract and thereupon his tender and the acceptance thereof shall be treated as cancelled & the BBJ shall be entitled to forfeit the full amount of the earnest money and to recover the liquidated damages for such default equivalent to the amount of Performance Guarantee.

8.3 The tenderer shall keep the offer open for a minimum period of 120 days from the date of opening of the tender within which period the tenderer cannot withdraw his offer. This period may be extended further if so required by mutual agreement between the parties from time to time. Any contravention of this condition will make the tenderer liable for forfeiture of this security deposit.

8.4 The tenderer/s shall clearly specify whether the tender is submitted on his behalf or on behalf of partnership concern. If the tender is submitted on behalf of partnership concern, he should submit the certified copy of partnership deed along with the tender and power of attorney to sign the tender documents on behalf of partnership concern. If these documents are not enclosed along with the tender documents, the tender will be treated as having been submitted by the person signing the tender in his individual capacity.

9.0 The BBJ will not be bound by any power of attorney granted by the tenderer or by changes in the composition of the firm made subsequent to the execution of the contract. It may, however, recognize such power of attorney and changes after obtaining proper legal advice the cost of which will be chargeable to the contractor.

10.0 If the tenderer, whether a sole proprietor, limited company or a partnership firm wants to act through agents or individual partner/partners, should submit along with the tender or at a later stage a power of Attorney duly stamped and authenticated by a public notary or by a Magistrate in favour of the specific person/s whether he/they be partner/partners of the firm or any other persons, specially authorizing him/them to submit the tender, sign the agreement, receive money, witness measurement, signs measurement book , compromise , delete relinquish any claim or claims preferred by firm and sign "No claim certificate" and refer all or disputed items to arbitration.

11.0 The BBJ reserves the right to accept a tender in whole or in part or reject any tender or all tenders without assigning reasons for any such action.

12.0 **NEGOTIATIONS WITH TENDERER(S)**

The BBJ reserve the right to hold negotiations with lowest bidder who should be lowest, valid, eligible and technically acceptable tenderer considered for award of contract directly if the rates were not unreasonably high.

13.0 **INSPECTION OF SITE**

Before submitting a tender, the tenderer/s will be deemed to have satisfied himself by actual inspection of the site and locality of the works, that all conditions liable to be encountered during the execution of the works are taken into account and that the rates he has entered in "Schedule of quantities and Rates" of the tender document are adequate and all inclusive to accord with the provision of the general and special conditions of contract for the completion of the works to the entire satisfaction of the Engineer. No claim shall be entertained from the contractor for making his own arrangements for approached roads from outside Railway land and contractor will bear entire expenses such as road taxes, payment on right of way etc. to outsiders.

14.0 **Examination of Documents**

The submission of the tender shall be deemed to have been done after careful study and examination of the tender document with full understanding of the implications thereof. Any clarification required by a tenderer shall be obtained from the office inviting tenders on any working day.

15.0 Tender documents are not transferable and cost of tender document is not refundable.

16.0 **Sequence of work**

16.1 The contractor(s) shall comply with the order of engineer in charge in regard to the sequences of tackling and progressing component parts of works.

16.2 The super structure works for this bridge are planned after a few months from start of subject foundation and sub–structure works. Accordingly, the contractor will be working in due course on both sides of approach of the bridge i.e. on Bairabi to SARANG (Mizoram) end. The agency is therefore required to adhere to work in a co-ordinated manner. The Engineer-in-charge will co-ordinate between the two agencies and that his decision will be final and binding in case of dispute between the two agencies.

17.0 **PREPARATION OF PERT CHART**

The successful tenderer within **20 days** after the contract is awarded, will make out a detailed **PERT** Chart along with detailed **programme chart** for each sub-activity based on accepted scheme indicating various stages of execution, method of execution and completion of work in different stages keeping the period of completion in view and submit the same to the engineer for the consideration and approval. The above programme shall be strictly adhered to.

18.0 **DEPLOYMENT OF KEY PLANT & EQUIPMENT**

18.1 The successful tenderer shall have to deploy key plant & equipment not less than the scale of deployment for the same as specified at Table-A duly adhering to the schedule of deployment. The successful tenderer shall deploy additional machinery as considered necessary for the timely completion of work as per site conditions.

19.0 **DEPLOYMENT OF KEY PERSONNEL**

19.1 The successful tenderer shall have to deploy key personnel not less than the scale of deployment for the same as specified at Table-B. The successful tenderer shall deploy additional experienced personnel & skilled/semi-skilled labour for the timely completion of work as per site condition.

20.0 **PARTICIPATION OF JOINT VENTURE (JV) FIRMS IN WORKS TENDER:**

20.1 Separate identity/name shall be given to the Joint Venture Firm.

20.2 Number of members in a JV Firm shall not be more than three, if the work involves only one department (say Civil or S&T or Electrical or Mechanical) and shall not be more than five, if the work involves more than one department.

20.3 A member of JV Firm shall not be permitted to participate either in individual capacity or as a member of another JV Firm in the same tender.

20.4 The tender form shall be purchased and submitted only in the name of the JV Firm and not in the name of any constituent member.

20.5 Normally Earnest Money Deposit (EMD) shall be submitted only in the name of the JV Firm and not in the name of constituent member. However, in exceptional cases, EMD in the name of Lead Member can be accepted subject to submission of specific request letter from Lead Member stating the reasons for not submitting EMD in the name of JV Firm and giving written confirmation from JV members to the effect that EMD submitted by the Lead Member may be deemed as EMD submitted by JV Firm.

20.6 One of the members of the JV Firm shall be its Lead Member who shall have a majority (at least 51%) share of interest in the JV Firm and also, must have satisfactorily completed in the last seven previous financial years and the current financial year up to the date of opening of the tender, Three similar completed works costing not less than the amount equal to **40%** of the estimated cost Or Two similar completed works costing not less than the amount equal to **50%** of the estimate cost Or One similar completed work costing not less than the amount equal to **80%** of the estimated cost and fulfilled additional technical criteria as per Eligibility Criteria mentioned in Sl. No. A of Section-I of Tender Notice. The other members shall have a share of not less than 20% each in case of JV Firms with up to three members and not less than 10% each in case of JV Firms with more than three members. In case of JV Firm with foreign member(s), the Lead Member has to be an Indian Firm with a minimum share of 51%.

20.7 A copy of Memorandum of Understanding (MoU) executed by the JV members shall be submitted by the JV Firm along with the tender. The complete details of the members of the JV Firm, their share and responsibility in the JV Firm etc. particularly with reference to financial, technical and other obligations shall be furnished in the MoU. (The MoU format for this purpose shall be finalized by the BBJ in consultation with their Law Branch and shall be enclosed along with the tender).

20.8 Once the tender is submitted, the MoU shall not be modified/ altered/ terminated during the validity of the tender. In case the tenderer fails to observe/comply with this stipulation, the full Earnest Money Deposit (EMD) shall be liable to be forfeited.

20.9 Approval for change of constitution of JV Firm shall be at the sole discretion of the Employer (BBJ). The constitution of the JV Firm shall not be allowed to be modified after submission of the tender bid by the JV Firm, except when modification

becomes inevitable due to succession laws etc. and in any case the minimum eligibility criteria should not get vitiated. However, the Lead Member shall continue to be the Lead Member of the JV Firm. Failure to observe this requirement would render the offer invalid.

20.10 Similarly, after the contract is awarded, the constitution of JV Firm shall not be allowed to be altered during the currency of contract except when modification become inevitable due to succession laws etc. and in any case the minimum eligibility criteria should not get vitiated. Failure to observe this stipulation shall be deemed to be breach of contract with all consequential penal action as per contract conditions.

20.11 On award of contract to a JV Firm, a single Performance Guarantee shall be submitted by the JV Firm as per tender conditions. All the Guarantees like Performance Guarantee, Bank Guarantee for Mobilization Advance, Machinery Advance etc. shall be accepted only in the name of the JV Firm and no splitting of guarantees amongst the members of the JV Firm shall be permitted.

20.12 On issue of LOA (Letter of Acceptance), an agreement among the members of the JV Firm (to whom the work has been awarded) shall be executed and got registered before the Registrar of the Companies under Companies Act or before the Registrar/Sub-Registrar under the Registration Act, 1908. This JV Agreement shall be submitted by the JV Firm to the BBJ before signing the contract agreement for the work. In case the tenderer fails to observe/comply with this stipulation, the full Earnest Money Deposit (EMD) shall be forfeited and other penal actions due shall be taken against partners of the JV and the JV. This Joint Venture Agreement shall have, inter-alia, following Clauses:

20.12.1 Joint and Several Liability - Members of the JV Firm to which the contract is awarded, shall be jointly and severally liable to the Employer (BBJ) for execution of the project in accordance with General and Special Conditions of Contract. The JV members shall also be liable jointly and severally for the loss, damages caused to the Railways during the course of execution of the contract or due to non-execution of the contract or part thereof.

20.12.2 Duration of the Joint Venture Agreement - It shall be valid during the entire currency of the contract including the period of extension, if any and the maintenance period after the work is completed.

20.12.3 Governing Laws - The Joint Venture Agreement shall in all respect be governed by and interpreted in accordance with Indian Laws.

20.13 Authorized Member - Joint Venture members shall authorize one of the members on behalf of the Joint Venture Firm to deal with the tender, sign the agreement or enter into contract in respect of the said tender, to receive payment, to witness joint measurement of work done, to sign measurement books and similar such action in respect of the said tender/contract. All notices/correspondences with respect to the contract would be sent only to this authorised member of the JV Firm.

20.14 No member of the Joint Venture Firm shall have the right to assign or transfer the interest right or liability in the contract without the written consent of the other members and that of the employer (BBJ) in respect of the said tender/contract.

20.15 Documents to be enclosed by the JV Firm alongwith the tender:

20.15.1 In case one or more of the members of the JV Firm is/are partnership firm(s), following documents shall be submitted:

(a) Notary certified copy of the Partnership Deed,

(b) Consent of all the partners to enter into the Joint Venture Agreement on a stamp paper of appropriate value (in original).

(c) Power of Attorney (duly registered as per prevailing law) in favour of one of the partners of the partnership firm to sign the JV Agreement on behalf of the partnership firm and create liability against the firm.

20.15.2 In case one or more members is/are Proprietary Firm or HUF, the following documents shall be enclosed: Affidavit on Stamp Paper of appropriate value declaring that his/her Concern is a Proprietary Concern and he/she is sole proprietor of the Concern OR he/she is in position of "KARTA" of Hindu Undivided Family (HUF) and he/she has the authority, power and consent given by other partners to act on behalf of HUF.

20.15.3 In case one or more members is/are limited companies, the following documents shall be submitted:

(a) Notary certified copy of resolutions of the Directors of the Company, permitting the company to enter into a JV agreement, authorizing MD or one of the Directors or Managers of the Company to sign JV Agreement, such other documents required to be signed on behalf of the Company and enter into liability against the company and/or do any other act on behalf of the company.

(b) Copy of Memorandum and Articles of Association of the Company.

(c) Power of Attorney (duly registered as per prevailing law) by the Company authorizing the person to do/act mentioned in the para (a) above.

20.15.4 All the Members of JV shall certify that they are not black listed or debarred by Railways or any other Ministry / Department / PSU (Public Sector Undertaking) of the Govt. of India/State Govt. from participation in tenders/contract on the date of opening of bids either in their individual capacity or as a member of the JV Firm in which they were/are members.

20.16 Credentials & Qualifying Criteria**:** Technical and financial eligibility of the JV Firm shall be adjudged based on satisfactory fulfillment of the following criteria:

20.16.1 Technical Eligibility Criteria ("a" or "b" mentioned hereunder):

(a) Either the JV Firm or Lead Member of the JV Firm must have satisfactorily completed in the last seven previous financial years and the current financial year up to the date of opening of the tender, Three similar completed works costing not less than the amount equal to **40%** of the estimated cost Or Two similar completed works costing not less than the amount equal to **50%** of the estimate cost Or One similar completed work costing not less than the amount equal to **80%** of the estimated cost and fulfilled additional technical criteria as per eligibility criteria as mentioned in Sl. No. A of Section-I of Tender Notice

OR

(b) (i) In case of composite works (e.g. works involving more than one distinct component, such as Civil Engineering works, S&T works, Electrical works, OHE works etc. and in the case of major bridges – substructure, superstructure etc.), for each component, Three similar completed works costing not less than the amount equal to **40%** of the estimated cost Or Two similar completed works costing not less than the amount equal to **50%** of the estimate cost Or One similar completed work costing not less than the amount equal to **80%** of the estimated cost should have been satisfactorily completed by the JV Firm or by any member of the JV Firm in the previous seven financial years and the current financial year upto the date of opening of tender. The member satisfying technical eligibility criteria for the largest component of the work shall be the Lead Member and that Member shall have a majority (at least 51%) share of interest in the JV Firm.

(ii) In such cases, what constitutes a component in a composite work shall be clearly pre-defined with estimated tender cost of it, as part of the tender documents without any ambiguity. Any work or set of works shall

be considered to be a separate component, only when cost of the component is more than Rs. 2 crore each.

(iii) However, as long as the JV Firm or any member of the JV Firm meets with the requirements, in one or more components of the work, and has completed Three similar completed works costing not less than the amount equal to **40%** of the estimated cost Or Two similar completed works costing not less than the amount equal to **50%** of the estimate cost Or One similar completed work costing not less than the amount equal to **80%** of the estimated cost, and resultantly, all the members of the JV collectively, then meet the prescribed technical eligibility criteria, the JV shall stand technically qualified.

Note: Value of a completed work done by a Member in an earlier JV Firm shall be reckoned only to the extent of the concerned member's share in that JV Firm for the purpose of satisfying his/her compliance to the above mentioned technical eligibility criteria in the tender under consideration.

20.16.2 Financial Eligibility Criteria: The Average Annual financial turnover during last 3 years, ending 31st March of the previous financial year, should be at least 150% of the estimated cost by the JV Firm or the arithmetic sum of Average Annual Financial Turnover by all the members of JV Firm in the previous three financial years ending 31st March of the previous financial year shall be at least 150% of the estimated value of the work as mentioned in the tender.

Note: Contractual payment received by a Member in an earlier JV Firm shall be reckoned only to the extent of the concerned member's share in that JV Firm for the purpose of satisfying compliance of the above mentioned financial eligibility criteria in tender under consideration

FORMS, ANNEXURES, PROFORMA,
TOOLS & PLANTS & KEY PERSONNEL ETC.

SECTION-V

PROFORMA-I

(A) Experience :

(i) No. of years the firm has been in operation under its: present name.

(ii) Details of work executed/being executed by the tenderer: in the last seven years.

(iii) Testimonials from Clients Company on various works: Executed/being executed for the last ten years (with documentary proof).

(Details of works executed/under execution in the last seven years)

Sl. No.	Name of work & W/O number	Clients Address	Executed/ Contract value	Specified date of completion	Present status/ completed on

(B) Financial Position:

(i) Financial Turnover during the last three years (Copies of Audited Annual report, Accounts or a statement duly certified by a chartered accountants or Authenticated payment record of Railway should be enclosed).

Year	Turnover (Rs. in lakhs)
2015 - 16	
2016 - 17	
2017 - 18	

(C) Technical Capability:

(i) List of tools, Plants, equipment and machinery available with the tenderer along with their value (A copy approved Assessor's Certificate to be enclosed).

(ii) Name, qualifications of the technical Supervisors and staff under the employment of the tenderer and organization on hand and proposed to be engaged for the subject work (Authenticated by a chartered Accountant).

(iii) Other facilities available with the tenderer not covered hither to:

(D) Tenderer(s) knowledge from actual personal investigation of the resources of the region or District(s) in which he offers to work:

(E) Any other details that the tenderer may like to furnish to substantiate their financial and technical ability to undertake this work and complete the same within stipulated period of completion.

Table-A

LIST of KEY PLANT & EQUIPMENT TO BE DEPLOYED AT SITE for Cantilever Erection of Bridges

At Receiving and Assembling Yard

Sl. No.	Description	Nos. required at each end	Total Nos. required per span
1	Crane for unloading fabricated materials (also to be used for assembling steelwork) 15 t capacity at 15 m radius	1	2
2	Bogies for transporting materials from yard to erection point capacity 20t	2	4
3	Compressor 12 cum/min	1	2
4	Generator 63 KVA	1	2
5	Truck 10 t capacity	2	4
6	Riveting Equipment/ Bolting Equipment	3 sets	6 sets
7	Gas cutting equipment	1 set	2 sets
8	Welding equipment	1 set	2 sets
9	Small tools and tackles	1 lot	2 lots
10	Service Bolts and Drifts	As reqd.	As reqd.

Erection Point

Sl. No.	Description	Nos. required at each end	Total Nos. required per span
1	Erection Crane (custom built light weight) Capacity 20 t and 15 m radium	1	2
2	Compressor 25 cum/min	1	2
3	Generator 90 KVA	1	2
4	Riveting Equipment	8 sets	16 sets
5	Gas cutting equipment	1 set	2 sets
6	Welding equipment	1 set	2 sets
7	Small tools and tackles	1 lot	2 lots
8	Service Bolts and Drifts	As reqd.	As reqd.
9	Hydraulic Jacks Enerpac or equivalent 250 t capacity	4 Nos.	8 Nos.

Note:

1.0 The above mentioned Plant & Equipment must be deployed at least 6 months before scheduled completion of the work.

2.0 Failure to deploy the above scale of equipment shall attract penalty @ Rs. 5,000/- per day per No. of Crane and Rs.1,000/- per day per No. /set for other items.

Table-B

Deployment of Key Erection personnel for Cantilever erection:

Note: In bridge erection, especially over heights as necessitated in the subject bridge(s), it is extremely important that all the workers are skilled and experienced as otherwise; one person's incompetence may cause a major accident endangering all other workers not to mention material damage. Therefore, as a rule no unskilled labour should be allowed to work on the bridge proper; they can only work in the yard.

The contractor shall deploy the following minimum key personnel during the execution of Contracted work at lease 6 months before scheduled completion of the work.

A. At Receiving and Assembling Yards

Sl. No.	Description	Total Nos. required per bridge
1	Yard Engineer with min of 10 years experience in fabrication and assembly of steelwork	2
2	Foreman with min of 10 years experience in fabrication and assembly of steelwork	2
3	Crane operator with min. 5 years experience	2

B. At Erection Points

1	Erection Engineer with min of 10 years experience in Steel Bridge Erection and experience in erecting at least 2 bridges by cantilever erection	2
2	Foreman with min of 10 years experience in Steel Bridge Erection and experience in erecting at least 2 bridges by cantilever erection	2
3	Electro Mechanical Supervisor with min. 10 years experience in handling electrical and mechanical equipment, pipe lines etc	2
4	Crane operator with min. 10 years experience of handling steelwork and working at heights	2
5	Engineer (Riveting) with min. 5 years experience in supervising bridge riveting	2
6	Foreman (Riveting) with min. experience of 10 years in bridge steelwork riveting	2

C. In addition to the above, there shall be a Safety Engineer at site with at least 5 years Experience in Steel Bridge Erection.

D. Sufficient personnel from "The National Skill Development Corporation India" (NSDC) shall be engaged.

NOTE:

1.0 The Bio-data (Name, Qualification, Years of experience etc.) of the key personnel as mentioned above, who are proposed to be deployed, shall be furnished in the tender offer. It will be essential to retain the same key personnel for continuity of the project. However, in case a situation arises to replace the key personnel for whatever reason, the same will be done in consultation with the BBJ.

2.0 The key personnel should be available at site whenever required by the Engineer to take instructions. Incase the Contractor fails to employ the aforesaid key personnel a reasonable amount, not exceeding a sum of Rs.25,000/-, shall be deducted from the bills of works (including other works) payable to the contractor for each month

of default in case of items 1 & 2 of Para A & B Viz. (A – At Receiving & Assembling Yards and B – At Erection points) and Rs.15,000/- for each month of default in other cases.

3.0 Apart from the above the contractor shall deploy minimum 200 Nos. of Skilled/Semi-skilled reinforcement labour and 150 Nos. of Skilled/Semi-skilled piling labour w.e.f. D21. Incase the Contractor fails to deploy the aforesaid Skilled/Semi-skilled labour a reasonable amount, not exceeding a sum of Rs. 300/-, shall be deducted from the bills of other works payable to the contractor for each day of default per each labour.

4.0 The decision of the engineer as to the period for which the required key personnel labour were not employed by the Contractor and as to the reasonableness of the amount to be deducted on this account shall be final and binding on the Contractor.

Annexure C -Special Conditions

Following document are required to be submitted along with the tender by the tenderer(s) for consideration of BBJ.

Documents to be submitted with the Tender

Sl. No.	Item	Document Format
1	Company Profile	Proforma – I
2	Details of contractual payments received during last seven years (i.e. current year & four previous financial years)	Proforma – II, IIA & IIB
3	Details of construction machineries, tools & plants, vehicle etc. available on hand and proposed to be utilized in work.	Proforma – III
4	Details of Technical and other Key Personnel available on hand and proposed to be engaged in work.	Proforma – IV
5	Details of Court Cases during last four years.	Proforma – V
6	Details of Arbitration if any (in last 5 years)	Proforma – VI
7	Broad plan of execution of this work within the stipulated completion period.	Proforma – VII
8	Comprehensive Organizational Chart	Proforma –VIII

CHAPTER-V

PROFORMA - I

COMPANY PROFILE

Sl. No.	Item	Details
1	Full name of the contractor/construction firm and year of establishment	
2	Registered Head Office Address: with Telephone/fax/e-mail	
3	Branch Office in India Address: with Telephone/fax/e-mail	
4	Constitution of firm: (Copy of full details including Memorandum and articles of Association, registered partnership deed and power of attorney holder etc.to be enclosed)	
5	Particulars of registration: with Government/semi Government Organisation: (copy to be enclosed)	

CHAPTER-V

PROFORMA-II

DETAILS OF CONTRACTUAL PAYMENTS RECEIVED DURING LAST SEVEN YEARS (i.e. CURRENT YEAR & THREE PREVIOUS FINANCIAL YEARS)

Sl.No	Financial Year	Contractual payments received	Name of the employer / client with full postal address& Telephone no & Fax No	Documentary proof regarding contractual payments (enclose copy of letter/statement separately for each work year wise and indicate Annexure No. in the column)
1	2	3	4	5
	2015-2016			
	2016-2017			
	2017-2018			

CHAPTER-V

PROFORMA- IIA

STATEMENT OF WORKS IN PROGRESS

Tenderer(s) should furnish information as per the proforma given below for the firm/company and for each member (in case joint venture) on their current commitments on all contracts that have been awarded, or for which letter of acceptance has been received, or for the contracts approaching completion, but for which an unqualified, full completion certificate is yet to be issued.

SL. NO	Name of work	Date of award	Contract No & date	Name & Address of Client (including Tel./Fax No.)	Contract value (in Rs.) Original/ Revised	Date of Completion Original/ Revised	Total payment received
1	2	3	4	5	6	7	8
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

NB:

1) If any one or more of the detailed information furnished in the tenderer's documents is proved to be false at any stage, the contractor/ firm will be debarred then and there, from all the commitments connected with the tender and his/their tender/contract will be rejected/terminated and further action will be taken as per extant rules.

2) Separate sheet may be used for furnishing the above information, if necessary.

CHAPTER-V

PROFORMA-IIB

STATEMENT OF WORKS ABANDONED/LEFT INCOMPLETE

Tenderer(s) should furnish the information as per proforma given below for the firm/ company for last seven years ending 31.03.2018.

Sl. No.	Name of the work	Date of award of work	Contract No.& date	Name & address of Client (including Tel./Fax No.	Contract value in (Rs.) Original / Revised	Percentage of work executed	Month & year since abandoned	Reason for abandoning the work
1	2	3	4	5	6	7	8	9
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

NB:

1) If any one or more of the detailed information furnished in the tenderer's documents is proved to be false at any stage, the contractor/ firm will be debarred then and there, from all the commitments connected with the tender and his/their tender/contract will be rejected/terminated and further action will be taken as per extant rules.

2) Separate sheet may be used for furnishing the above information, if necessary.

CHAPTER-V

PROFORMA-III

DETAILS OF TOOLS & PLANTS, VEHICLES ETC. AVAILABLE ON HAND AND PROPOSED TO BE UTILIZED IN WORK

Sl. No.	Description of equipmetnts	Number available (Owned/ hired)	Date of purchase	Date of manufacture	Make	How driven (i.e) Petrol/ Diesel / electrical	Condition of the equipment	Where the equipment can be inspected
1	2	3	4	5	6	7	8	9

NB:
1) The agency will preferably be required to deploy one more machine each of the above description as standby so as to ensure that minimum above mentioned scale of machines are working at all times.

2) Failure to deploy the above equipment as per mutually agreed programme shall attract penalty @ Rs.10,000/- per day of delay for each equipment at S. No.1 to 6 & @ Rs.5,000/- per day for other machines.

CHAPTER-V

PROFORMA-IV

DETAILS OF TECHNICAL AND OTHER PERSONNELS AVAILABLE ON HAND & PRPOSED TO BE ENGAGED IN WORK

Sl. No.	Name	Age	Technical qualification(s)	Position with the tenderer	Commencement of present employment	Total experience	Emoluments
1	2	3	4	5	6	7	8

CHAPTER-V

PROFORMA-V

LIST OF COURT CASES DURING LAST 5 YEARS

Sl No.	Name of work	Value of work	Name of Client Deptt.	Name of the Court	Date of institution of case	Relief sought from Court	Brief reason of dispute	Final/ Present position of the case
1	2	3	4	5	6	7	8	9

PROFORMA-VI

LIST OF ARBITRATION CASES DURING LAST 5 YEARS.

Sl No.	Name of work	Value of work	Name of Client Deptt.	Amount and date of claim preferred	Claim of Deptt. if any	Brief reasons of disputes	Final/ Present position of the case
1	2	3	4	5	6	7	8

CHAPTER-V

PROFORMA-VII

BROAD PLAN OF EXECUTION OF THIS WORK WITHIN THE STIPULATED COMPLETION PERIOD

Sl.No	Activity	Period of completion in months

CHAPTER-V

PROFORMA-VIII

COMPREHENSIVE ORGANISATIONAL CHART

AGENCY'S FAMILARIZATION

Name of work: SUPPLYING, FABRICATION, ASSEMBLING AND ERECTION OF STEEL THROUGH GIRDERS/PLATE GIRDERS/COMPOSITE GIRDERS FOR 03 NOS MAJOR BRIDGES HAVING TOTAL 12 SPANS [i.e BRIDGE NO 78 (78.8M X 6 NOS), BRIDGE NO 167-168 (78.8M X 6 NOS)] INCLUDING METALIZING OF MEMBERS, FITTING & FIXING OF BEARINGS, FITTING OF CHANNEL SLEEPERS/ H-BEAM SLEEPERS, TRACK LINKING, PAINTING AND OTHER ANCILLIARY WORKS IN BETWEEN STATIONS BAIRABI AND SAIRANG IN CONNECTION WITH THE CONSTRUCTION OF NEW BG RAILWAY LINE FROM BAIRABI TO SAIRANG (MIZORAM)

I/We hereby solemnly declare that I/we have visited the site of above work and have familiarized myself/ourselves of the working conditions there in all respects and in particular the following:

Topography of the area and existing Road network (highways & Village, Pucca & Kacha) and availability of Service Roads.

Soil Conditions at the site of the work.

Sources and availability of construction material.

Rates for Construction materials.

Availability of local labour, both skilled and unskilled and the prevailing labour rates.

Availability of Water, Electricity and communication facilities.

Availability of space for putting up labour camps, offices Store Godowns, Engineering yards etc.

Socio-political information of the locality

SECTION-VI

PRE CONTRACT INTEGRITY PACT

PCIP-1

PRE CONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on _____ day of the month of _____ 2019, between on one hand, THE BRAITHWAITE BURN & JESSOP CONSTRUCTION COMPANY LIMITED, 27, Rajendra Nath Mukherjee Road, Kolkata – 700 001 (hereinafter called the "BUYER", which expression shall mean and include, unless the contest otherwise requires, its successors in office and assigns) of the First Part and M/s _____ represented by Shri _____ (Designation) (hereinafter called the "BIDDER/Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure/contract for **TENDER NO. eNIT/DGM(P-V)/BRIDGES/MIZORAM/2150/3131/41-2019** and the BIDDER/Seller is willing to offer/has offered the same and

WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a PSU performing its function on behalf of the President of India.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to :-

Enabling the BUYER to obtain the desired said stores/equipment/contract at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERs to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto herby agree to enter into this Integrity Pact and agree as follows:

Commitments of the BUYER

1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

1.2 The BUYER will, during the pre-contract stage, treat all BIDDERs alike, and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERs.

PCIP-2

1.3 All the officials of the BUYER will report to the appropriate Government Office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

Commitments of the BIDDERs

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:

3.1 The BIDDER will not offer, directly or through intermediaries, any bribe, gift consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organisation or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government/the Company for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the Government/the Company.

3.3* BIDDERs shall disclose the name and address of agents and representatives and Indian BIDDERs shall disclose their foreign principals or associates.

3.4* BIDDERs shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.

3.5* The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the BIDDER or any employee of the BIDDER or any persons acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender.

The terms 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4. **Previous Transgression**

4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER's exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. **Earnest Money (Security Deposit)**

5.1 While submitting commercial bid, the BIDDER shall deposit an amount of **Rs.20,00,000/-** (to be specified in RFP) as Earnest Money/ Security Deposit, with the BUYER through any of the following instruments:

(i) Bank Draft or a Pay Order in favour of **THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED**.

(ii) A confirmed guarantee by an Indian Nationalised Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.

(iii) Any other mode or through any other instrument (to be specified in the RFP)

5.2 The Earnest Money/Security Deposit shall be valid upto a period of five years or the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER including warranty period, whichever is earlier.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions of Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money/Security Deposit for the period of its currency.

6. **Sanctions for Violations**

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with other BIDDER(s) would continue.

(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/ Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank Of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilised to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the buyer shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(vii) To debar the BIDDER from participating in future bidding processed of the Government of India/the Company for a minimum period of five years which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with BIDDER, the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) of an offence as defined in chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7. **Fall Clause**

7.1 The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.

8. **Independent Monitors**

8.1 The BUYER will appoint Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Names and Addresses of the Monitors to be given).

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

PCIP-6

8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department/within 8 to 10 weeks from the date of reference or intimation to him by the BUYER/BIDDER and should the occasion arise, submit proposals for correcting problematic situations.

9. **Facilitation of Investigation**

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Account of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. **Law and Place of Jurisdiction**

This Pact is subject to Indian law. The place of performance and jurisdiction is the seat of the BUYER.

11. **Other legal Actions**

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. **Validity**

12.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this Pact turn out to be invalid, the reminder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this integrity Pact at _____ on _____

BUYER	BIDDER
Name of the Officer	CHIEF EXECUTIVE OFFICER
Designation	
PSU	
Witness	Witness
1. _____	1.
2. _____	2.

* Provisions of these clauses would need to be amended/deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers.

END OF THE TECHNICAL BID DOCUMENT

TWO PACKET SYSTEMS TENDER

PART – II

PRICE BID DOCUMENT

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(iii)	Tender Document Issue / Download Slip		
2	Guidance To Tenderers		
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14	Top Sheet of Agreement		

CHAPTER-III

ADDITIONAL SPECIAL CONDITION OF CONTRACT

1. **INTENT OF PLANS, SPECIFICATION AND CONTRACT DOCUMENTS:**

The work to be carried out under this contract shall, except as otherwise provided in these conditions, include all labour, materials, (except the materials to be supplied by BBJ free of cost) construction plant, equipment and transport which may be required in preparation of and for the full and entire execution and successful completion of the works. The description given in the Schedule of works shall, unless otherwise stated, be held to include carriage and cartage, carrying and hoisting, setting, fitting and fixing in position and all other labour, necessary in and for the full and entire execution and successful completion of the works as aforesaid in accordance with good practice and recognized principles and any urgent and temporary works fully contingent upon the works.

2. **INSPECTION AND ADMISSION TO SITE:**

2.1 The Contractor shall not be permitted to enter on (other than for inspection purpose) or take possession of the site until instructed to do so by the Engineer in writing. The portion of the site to be occupied by the contractor shall be defined and/or shown in the site plan, or this shall be indicated by the Engineer, and the contractor shall on no account be allowed to extend his operation beyond these areas. The contractor shall not use or allow it to be used the site so allowed to him by the BBJ for any purpose other than that of executing the work. The contractor shall make his own arrangement at his own cost for any additional land required by him for the purpose of execution of the work.

2.2 The Contractor shall at his own cost provide, if necessary or if required on the site, all temporary access thereto, to the satisfaction of the Engineer and shall alter, adopt and maintain the same as required from time to time and shall take up and clear them away as and when no longer required and make good all damage done to the site.

2.3 The Tenderer(s) before quoting his rate shall carefully inspect the site and shall be deemed to have satisfied himself about the nature and type of work including ancillary works necessary for satisfactory execution of work. Site accessibility, availability of required materials, need of suitable rollers for compaction of earthwork, drying and wetting of soil before compactions, arrangement for the testing equipment for quality control of earthwork and concrete etc. must be kept in view while quoting the rates.

3. **MODIFICATION OF DRAWINGS:**

BBJ reserves the right to alter/modify the drawings/design to suit the site conditions. If due to the change in drawings or designs there is any increase or decrease in quantities in the items of the schedule, payment shall be made only for the actual quantities executed at the accepted rates. If there is sufficient ground for granting extension of the date of completion on this account, the BBJ will consider such request on the merits of each individual case. Such circumstances shall in no way affect or vitiate the contract or alter the character thereof or entitle contractor to damages or compensation thereof.

4. **QUANTITIES IN SCHEDULE AND THEIR VARIATIONS:**

The procedure detailed below shall be adopted for dealing with variations in quantities during execution of works contracts subject to approval of the BBJ.

4.1 Individual NS items in contracts shall be operated with variation of plus or minus 25% and payment would be made as per the agreement rate.

4.2 In case an increase in quantity of an individual item by more than 25% of the agreement quantity is considered unavoidable, the same shall be got executed by floating a fresh tender. If floating a fresh tender for operating that item is considered not practicable, quantity of that item may be operated in excess of

125% of the agreement quantity subject to the following conditions:

(i) Quantities operated in excess of 125% but upto 140% of the agreement quantity of the concerned item, shall be paid at 98% of the rate awarded for that item in that particular tender;

(ii) Quantities operated in excess of 140% but upto 150% of the agreement quantity of the concerned item shall be paid at 96% of the rate awarded for that item in that particular tender;

(iii) Variation in quantities of individual items beyond 150% will be prohibited and would be permitted only in exceptional unavoidable circumstances with the concurrence of the BBJ and shall be paid at 96% of the rate awarded for that item in that particulars tender.

(b) The variation in quantities as per the above formula will apply only to the Individual items of the contract and not on the overall contract value.

(c) Execution of quantities beyond 150% of the overall agreemental value should not be permitted and, if found necessary, should be only through fresh tenders or by negotiating with existing contractor, with prior approval of the competent authority of the BBJ.

5. If the Railway requires decreasing the quantity of any individual item or the agreemental value BBJ shall apply the same to the contractor.

6. The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed for other items). A minor value item for this purpose is defined as an item whose original agreement value is less than 1% of the total original agreement value.

7. No such quantity variation limit shall apply for foundation items.

8. As far as SOR items are concerned, the limit of 25% would apply to the value of SOR schedule as a whole and not on individual SOR items. However, in case of NS items, the limit of 25% would apply on the individual items irrespective of the manner of quoting the rate (single percentage rate or individual item rate).

9. RATES:

9.1 The Tenderer(s)/Contractor(s) have to quote only percentage increase/decrease/at par rate in the schedule. The quantities in schedule of items of work are given in Annexure-I to IX. In case of any difference in rates given in words & figures, the lowest rate shall be taken as correct.

9.2 The rates for all the items of the schedule shall be inclusive of the cost of all arrangement for crossing frequently all obstructions, in course of the work over land or across water and the cost of providing and maintaining approach service roads and temporary bridging that may be necessary for bringing and removing the construction plants, machinery and materials to and from the site of the work including rent for use of private land and/or compensation for damage, if any due to intervening private land traversed by such approach service roads.

9.3 The rates quoted by the contractor shall be the cost of complete work and shall include the cost of all labour and materials including transport, loading, unloading as well as sheds, construction plants, temporary foundations, shuttering, scaffoldings and for which no separate payment is made to him, on satisfactory completion of the work shall remain the property of the contractor.

9.4 The contractor shall entirely be responsible for ensuring safety of his labour, vehicles, construction plants and equipment while working. No extra payment shall be allowed to the contractor for any safety precautions to be observed during the execution of the work. The cost of such precautions shall be deemed to have been included in the

rates for all the items of the schedule.

9.5 Conditional discounts offered by the tenderers for coverage within a shorter period, for early inspection/payment etc. shall not be considered for evaluation of tender.

10.0 MATERIALS:

10.1 The contractor shall at his own expense provide unless specified otherwise in schedule, all materials required for the works.

10.2 All materials to be provided by the contractor shall be in conformity with the specification laid down in the Standard and Special Specifications of the tender and the contractor shall, if required, furnish proof/test certificate, in support of this to the satisfaction of the Engineer.

10.3 To ensure quality control, test certificates from the manufactures should be produced by the contractors which should conform to the relevant specifications (latest may be incorporated).

10.4 The contractor shall be liable to render full account of all materials to be supplied by BBJ for consumption on the works, and keep proper records regarding their use, which shall be made available for inspection when required. Without prejudice to be right of the BBJ if it is detected that the quantity of cement and/or steel is less than the quantity ascertained/computed according to the prescribed specifications and approved drawings the cost of cement and/or steel not so used shall be recovered from the contractor(s) bill.

10.5 For stacking cement the contractor shall at his own cost build suitable damp proof godowns at the site of work and make all satisfactory storing arrangements to see that the strength of cement is not deteriorated.

10.6 The contractor shall indemnify the BBJ or any agent, servant or employee of the BBJ & Railway against any action claim or proceeding relating to infringement or use of any patent or design right and shall pay all royalties or other charges which may be payable in respect of any articles or materials or part thereof includes in the contract. In the event any claim being made or action being brought against the BBJ or Railway or any agent, servant or employee of theBBJ or Railway in respect of any such matters, as aforesaid the contractor shall be immediately notified thereof, provided that such indemnity shall not apply when such infringement has taken place in complying with the specific direction issued by the BBJ or Railway but the contractor shall pay any royalties or other charges payable in respect of any such use.

10.7 It shall be clearly understood that the rates to be quoted shall include all wastages and wash away either due to rains or storm or floods or other causes whatsoever. The rates shall also include the cost that may be necessary or stacking the materials at site of work.

11.0 **SUPPLY OF MATERIALS BY RAILWAY ON LOAN BASIS:** BBJ shall issue BBJ/ Railway material to the contractor subject to the availability and with specific request from the contractor as under:

11.1 The items of Stores viz. R.S. Joists with cross bracings, CC Cribs with Clamps, P. Way materials, Wooden sleepers, rails & fittings only as may be required for making "Temporary arrangement" for execution of the work shall be supplied by the BBJ/Railway on loan basis subject to the availability.

11.2 Materials to be supplied by the BBJ/Railway shall be issued only to the extent of requirement. The contractor shall make his own arrangement for loading, unloading and transportation of the materials from Rly.'s Godown/Depots set up at Bairabi to SARANG (Mizoram) or any other Station/location between stations as directed by the BBJ/Railway Engineer.

11.3 The Railway materials will be issued to the contractor by BBJ as per provision of para

1269 of the Indian Railway Engg.Code, 1999 - revised edition.

11.4 The contractor may also be issued the Railway materials directly from wagons, in which case a notice for taking delivery will be given by the Engineer or his representative and for which no extra payment shall be admissible. The contractor shall have to unload the wagons within the free unloading time admissible as per rules. In case of failure to do so within the free time, he shall be liable to pay demurrage charges. The rates quoted should include the cost of all transport, loading, unloading, re-handling, carriage with all lead lift & descent.

11.5 The contractor at his own cost shall return and hand over all the BBJ/ Railway materials issued on loan basis at the supply points/locations directed by the Engineer in serviceable and good conditions.

11.6 In case of failure of the contractor to return the BBJ/Railway materials issued on loan basis in serviceable/ sound and good condition the cost of the BBJ/Railway Materials not returned shall be recovered from the contractor at the recovery rate of excess materials supplied by the BBJ/ Railway should 1.5 time the cost of procurement which is inclusive of freight. The decision of the BBJ regarding serviceability or otherwise of the materials returned shall be final.

11.7 If there is any delay on the part of the BBJ in supplying materials which the BBJ has undertaken to supply as above and if as a result thereof the completion of the work is delayed, BBJ will consider on specific request by the Contractor granting suitable extension of completion date for such loss of time. BBJ will however, not entertain any claim from the contractor on this regard due to any loss suffered by him on account of his labour or any other account as a result of delay in supply of materials.

11.8 For items at the percentage rate above, below or at par with BBJ Unified Standard Shedule of Rates 2010 edition under the head "Any other items of works etc." the rates quoted shall include all loading carrying and transport of materials supplied by the BBJ.

12.0 SITE FACILITIES:

12.1 The quoted rates shall be deemed to include charges for all site facilities for labour that are considered necessary for execution of the work.

12.2 No assurance can be given regarding the vulnerability of Railway land given for use to the contractor to flooding during high floods. BBJ undertakes no responsibility or liability in this regard.

13. WATER SUPPLY

The contractor(s) shall make his/their own arrangement for potable water supply required for execution of the work. The contractor shall also provide and maintain at suitable places easily accessible to labour, sufficient supply of water for drinking.

14.0 TAXES

14.1 The rates quoted shall include all taxes (except GST), direct or indirect, leviable under Central, State or Local Bodies Act or Rules Octrois, Tolls, Royalty, monopoly, seigniorages, cess and similar imposts that may be prevailing from time to time in respect of land, structures and all materials supplied in the performance of this contract.

14.2 Whenever forest produces like sand, stone, timbers etc. are used in the work, the contractor(s) will have to furnish documentary proof that requisite royalty on such produces has been paid to the concerned departments.

14.3 The work being "Work Contract" which is one and individual and which involves no separate contract for the sale of materials, the contractor shall not be entitled to get any GST and or any other taxes/ levies etc reimbursed from the BBJ

Administration for the supply of materials.

15. **PLEA OF CUSTOM.**

15.1 The plea of "Custom" prevailing will not on any account be permitted as an excuse for infringement of any of the conditions of contract or specifications.

15.2 The contract shall not be vitiated by any inadvertent omissions of any kind in the surveys, information, specifications, drawings or schedule of quantities.

16. **BONDED LABOUR SYSTEM:** The tenderer shall note that bonded labour system is completely done away with on the BBJ including contractor's establishments on the BBJ.

17.0 PROGRAMME AND COMPLETION PERIOD

17.1 Since, the time is the essence of the contract, the tenderer shall note that in the event of his tender being accepted, he should be in a position to commence the work immediately and shall complete the same in all respect within the continuous period of stipulated time from the date of issue of acceptance letter whatever be the date of execution of work order or agreement.

17.2 It shall be obligatory for the tenderer to submit his programme of work and time schedule, in such a form as to facilitate monitoring of the work using the modern networking techniques, as to how he proposes to complete the work within the stipulated date.

17.3 Within 20 days of the acceptance of the tender and before the work is commenced; the contractor shall have to submit a detailed programme for each major element of the work, using the modern networking techniques for Project monitoring, for approval of the Engineer. The construction programme will show the general methods, arrangements, order and timing for all the significant activities in the works identifying the critical path for the work clearly, along with monthly cash flow. The programme shall clearly provide for and indicate the time required for the preliminaries before starting the work and shall indicate the dates of commencement and completion of the various sections of the work.

17.4 The agreement or the approval of the programme by the Engineer shall not relieve the contractor of any of his responsibilities to complete the whole works by the prescribed time.

17.5 If the work does not commence within specified date of starting or if at the subsequent time the rate of execution falls below the specific programme as indicated above, the BBJ Administration will have the power to determine the end of the contract at any stage without incurring any liability on the part of the BBJ Administration for any sort of compensation for the money invested by the contractor(s) or the loss incurred by him/them due to such termination of the contract. In all cases of incomplete work, either by termination of contract by the BBJ Administration under consideration stated above or due to failure on the part of the contractor(s) to complete the work within stipulated date of completion of the Agreement, the BBJ shall be entitled to take the action for rescinding the contract in terms of clause 62 of GCC-98.

If the bidder fails to complete the total work/ supply as per requirement and within the stipulated completion period, BBJ reserves the right to cancel the order, either in part or full as the situation demands and get the work done by deploying other agency/agencies by issuing first seven days and then 48 hours' notice. Additional cost if incurred shall be recovered from the bidder's bill/SD/PBG/EMD/ Any other mode of payment.

17.6 The Contractor shall submit to the Engineer, for approval, an updated Program, whenever the Engineer may so direct, to take account of the actual progress of the Contract Works so as to achieve completion either before the due date for completion or by the due date for completion or as soon as practicable thereafter. The Engineer may further require the Contractor to indicate the means by which the programmed progress will be achieved. If the Contractor does not submit an updated Programme within a reasonable period as indicated by the Engineer, the Engineer may withhold the payment of next on account bill until the overdue Programme has been submitted.

18.0 EXTENSION OF COMPLETION DATE:

18.1 Extension of time for the completion of the work shall be governed by Clause 17 of the GCC (Part-A) and SSCC (Part-B) – 1998 and the contractor shall be responsible for requesting such extension in terms thereof. While applying for such extension, a Bar Chart showing the work already done and the program for the work to be done shall be prepared and shown in juxtaposition with the bar chart submitted in terms of contract conditions, giving reasons for activity-wise slippage. The Tenderer shall agree to such extension of time of completion, as considered justified and as approved by the BBJ.

18.2 TOKEN PENALTY: Extension under Clause 17(B) of GCC (Part-A) and SSCC (Part-B)-1998 provides for recovery of liquidated damages from the contractor. While granting extension to the currency of the contract under Clause 17(B) of this GCC the competent authority may also consider levy of token penalty as deemed fit based on the merit of the case.

19.0 PROGRESS OF WORKS.

19.1 The contractor shall submit to the Engineer a monthly report giving progress of works by the third of the following month.

19.2 It shall be ensured that the works are carried out according to the agreed programme and no change is made except with the prior approval or at the instance of the Engineer.

19.3 The contractor shall participate in periodical meetings with the Engineer to review the progress of the work. In case a slippage in the time schedule due to the contractor's inability to perform as per agreed programme, the contractor shall take such action as may be necessary to bring back his work to schedule without additional cost to the BBJ, either by employing over time operations, increasing the number of shifts, capacity of construction plants, or as directed by the Engineer.

19.4 The contractor shall immediately inform the Engineer whenever there is or is likely to be any change in the schedule.

20.0 EXECUTION OF WORKS.

20.1 INSPECTION OF SITE.

The tenderer shall in their own interest examine the drawings, conditions of contract and specifications of work. They shall also inspect the site and satisfy themselves on their own as to the hydrological, climatic and physical conditions prevailing at site, the nature, extent and practicability of the works, all existing and required roads and other means of communication and across to the site, whether by water or land, availability of housing and other facilities, the source of supply of different materials and their adequacy, royalty, monopoly ferry charges, labour and probable site for labour camp, stores and godowns etc. They shall themselves obtain all necessary information as to risk, contingencies and other circumstances which may effect or influence their tender. No extra

charges consequent on any insufficient appreciation or otherwise shall be entertained.

20.2 Should there be any discrepancy in, or any doubt or obscurity as to the meaning of any of the tender documents or as to any thing to be done or not to be done by the tenderer or the instructions to be observed by him, he must set forth in writing such discrepancies, doubts or of obscurities and submit the same to the BBJ for elucidation as soon as possible but not later than 10 days before the last date fixed for receipt of tenders.

21.0 SUPERVISION AND APPROVAL BY ENGINEER.

21.1 All works embracing more than one process shall be subject to examination and approval by the Engineer at each stage thereof and the contractor shall give due notice to the Engineer or the whatsoever representative when such state is ready. In default of such notice, the Engineer shall be entitled to appraise the quantity and extent thereof, even at a later stage at the risk and cost of the contractor.

21.2 The contractor will set up a properly equipped laboratory either in the field or at a suitable location to conduct test regarding quality control of concrete and other tests as required under the specification prescribed.

21.3 The Engineer reserves the right to reject the whole or part of work executed, which in his judgment does not comply with the requirements of the specifications. The decision of the Engineer shall be final and conclusive in this matter for all purposes.

22.0 EXAMINATION OF WORK BEFORE COVERING UP.

22.1 No work shall be covered up or put out of view without the approval of the Engineer or his whatsoever representative and the contractor shall accord full opportunity for examination and measurement of any work which is about to be covered up or put out of view and for examination of foundations before permanent work is put thereon. The contractor shall give 7 days' notice to the Engineer or his representative whenever any such work of foundation is ready for examination and the Engineer or his whatsoever representative shall within reasonable time, unless he considers it unnecessary and advises the contractor accordingly, attend for the purpose of examination and measurement of such foundations. In the event of failure of the contractor to give such notice he shall, if required by the Engineer, uncover such work at contractor's expense.

22.2 BBJ Officials concerned with the contract shall have powers at any time to inspect and examine any part of the works and the contractor shall give such facilities as may be required for such inspection and examination.

22.3 The contractor shall uncover any part of work and or make openings in or through the same as the Engineer may from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the Engineer at his own cost.

23.0 REMOVAL OF OBSTRUCTIONS.

23.1 Before the work is started, the site shall be cleared of all obstructions like trees and bushes along with their roots, heavy grass and shrubs by the contractor at his own cost.

23.2 The contractor shall not have any claim in case of delay by the BBJ/Railway in removal of trees or shifting raising, removing of telegraph or telephones or electric lines (overhead or underground) and other structure, if any, which may come in way of the work.

24.0 STORES, SHEDS AND YARDS.

24.1 The contractor shall provide at his own cost suitable storage arrangement for cement and steel to the satisfaction of the Engineer and the Engineer or his representative shall have the authority at all times to inspect the storage arrangement and contractor shall provide all facilities for inspection and check of materials. For the materials supplied by the BBJ/Railway, the contractor shall at all times maintain proper records showing the basis of the indent, the receipts and whatsoever of the materials and these shall at all times be opened for inspection by the Engineer or his representative.

24.2 The storage capacity for cement shall be for not less than 30 days requirement of cement for the work on hand and anticipated at the time at the rate of progress of work. The arrangement for storage shall be such as to ensure that utilization of cement is in order of its arrival at the stores.

24.3 Steel and cement which are, supplied by the BBJ/Railway, shall be stored by the contractor only at places approved by the Engineer. The storage and safe custody of these materials after issue shall be the responsibility of the contractor.

24.4 Inflammable materials such as petrol, oil etc. shall be stored separately from other store and all the precautions as required under the Indian Explosive Act shall be taken by the contractor(s) and shall indemnify absolutely the BBJ and its officers and employees against any claim or liability arising out of any accident or violation of any laws, rules and orders.

25.0 TOOLS AND PLANTS.

25.1 All construction plants, temporary works and materials provided by the contractor shall when brought to the site be deemed to be exclusively intended for the construction and completion of the work and the contractor shall not remove the same or any part thereof (save for this purpose of moving it from one part of the site to another) without the consent in writing of the Engineer.

25.2 On completion of the work, the contractor shall remove from the site all the said construction plants and temporary works remaining thereon and any whatsoever materials provided by the contractor.

25.3 BBJ shall not at any time be liable for the loss of injury to any of the said construction plant, temporary works of materials save as otherwise provided in these documents.

25.4 The contractor shall make his own arrangement for all construction plants and equipment, tools including spare parts, fuel and consumable stores and all labour required to ensure efficient and methodical execution of the work. The quoted rates shall be inclusive of all charges as such items.

26.0 NIGHT WORKS.

26.1 The provision in clause 23 of the General Conditions of the contract shall be noted regarding execution of work between sunset and sunrise. If the BBJ is however, satisfied that the work is not likely to be completed in time except by resorting to night work, by special order the contractor would be required to carry out the work, even at night, without conferring any right on the contractor for claiming extra payment for introducing night work. In the event of night working, the contractor will make necessary adequate lighting arrangement for smooth execution of work.

26.2 If the contractor works round the clock on all days including Sundays and holidays, the BBJ shall make arrangements for the supervision accordingly.

27.0 REPRESENTATION ON WORKS.

Regarding representation on works and supervision, the provisions in clause 12 of General Conditions of contract and clause 24 of Standard Special Conditions of Contract shall be applicable respectively.

28.0 REMOVAL OF DEFECTIVE WORKS:

If in the opinion of the Engineer, any of the works had been executed with improper materials or defective workmanship, the contractor when required by the Engineer, shall re-execute the same and substitute proper materials and workmanship forthwith at his own cost and in case of default of contractor in so doing within a week; the Engineer shall have full power to employ other persons to execute the work and the cost thereof shall be borne by the contractor.

29.0 DISMANTLING

29.1 When dismantling of any existing structure is involved to facilitate the Construction, the contractor shall submit the scheme for dismantling of the existing structure. Execution of dismantling works shall be done after approval of BBJ/Railway.

29.2 The dismantling of structure should be done under proper supervision and as per approved scheme of dismantling. At major dismantling sites minimum level of supervision shall be an Engineer, who should be nominated by BBJ or Dy.Chief Engineer/Con/Rly.

29.3 The dismantling Plan should be scrutinized by the Drawing Office and approved by H.O.D. of BBJ in case of Construction Organization. The dismantling plan should invariably show various stages of dismantling, equipments to be used for dismantling, area likely to be affected by debris, any adjacent buildings likely to be affected and action to be taken thereof.

29.4 Proper barricading should be done to stop access of unauthorized personnel near the dismantling area. Necessary arrangement should be made to prevent people from coming close to dismantling area. The contractor should also display sign boards warning people not to enter the danger zone.

29.5 Proper announcement through public address system should be done at regular intervals to keep the onlookers away from the major dismantling affected Zone.

29.6 The adjacent building likely to be affected by dismantling should also be informed and workers shall take all precautionary measures.

29.7 In area where law and order is likely to be affected, assistance of local Police should be taken to keep people away from dismantling area.

30.0 SAFETY MEASURES.

30.1 The following measures should be adopted to ensure safety at work site as well as work force.

(i) 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 so 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.

(ii) 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.

(iii) The supervisor/workmen should be conversant about safety measures. A competency certificate to the contractor's supervisor as below shall be issued by BBJ, which will be valid only for the work for which it has been issued.

COMPETENCY CERTIFICATE

Certified that Sri..... .....P.way supervisor of M/s. .....has been examined regarding P.way working on .....work, his knowledge has been found satisfactory andhe is capable of supervising the work safely.

.....Assistant Executive Engineer.....

(i) 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.

(ii) Supplementary site specific instructions, wherever considered necessary, shall be issued by the Engineer.

31.0 INTERFERENCE WITH TRAFFIC & PREVENTION OF ACCIDENTS.

31.1 The contractor shall not allow any road vehicle belonging to him or his supplier's 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 for permission giving the type & number of individual vehicle, name & license particular of the drivers, location duration & timings for such work/ movement. The Engineer 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's drivers, contractor's flagmen and supervisors to be deployed on the work, location, period and timing of the work. This permission will be subject to the following obligatory conditions:

i) The road vehicles will ply only between sunrise and sunset.

ii) Nominated vehicles & drivers will be utilized for work in the presence of at least one flagman &one supervisor certified for such work.

iii) The vehicles shall ply 6.0 m clear of track. Any movement/work at less than 6.0 m and up to minimum 3.5m clear of track centre shall be done only in the presence of BBJ employee authorized by the Engineer-in-charge. No part of the road vehicle will be allowed at less than 3.5m from track centre. Cost of such BBJ employee shall be borne by the BBJ.

iv) The Contractor shall remain fully responsible for ensuring safety & in case of any accident and shall bear cost of all damages to his equipment & men and also damages to BBJ & its passengers.

v) Engineer may impose any other condition necessary for a particular work or site.

vi) Such permission shall be returned to the Engineer, as soon as the work for which it is issued is over.

vii) Road vehicle can ply along the track after suitable cordoning of track with minimum distance of 6m from the centre of the nearest track. For plying of road vehicles during night hours, adequate measures to be communicated in writing

along with a site sketch to the contractor/contractor's representative and controlling Engineer/Supervisor of the work including officers and the in-charge of the section.

viii) Contractor shall provide 150mm thick white line with lime at a distance of 3.5m from centre of existing track. This white line shall be in the entire length where work is going on and/or the vehicles/machinery are playing along the track. Nothing extra shall be paid for this.

ix) Barricading with the help of portable fencing shall be provided in the length where the dayswork is to be done in close vicinity of the track. The fencing shall consist of self-supporting steel columns shall be of 1.2m heights. This will be placed at a distance of 3.5 form whatsoever of the nearest track. This shall be paid.

x) BBJ representative not less than a junior engineer 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 competency certificate will not work at site.

xi) If vehicle/machinery/materials are to come within 3.5m of the existing track, work must be done under the presence of an inspector authorized to do safety works. A caution order shall be issued and track will be protected with the banner flags, hand signal lamps and detonators.

xii) Where contractor's vehicles are permitted to ply adjacent to the running lines, experienced Gang man shall be posted by the Railway as Flagman at the cost of the contractor to prevent accidents and the cost so incurred will be recovered from the contractor's dues.

xiii) The contractors shall be responsible for the safety of his workmen and shall provide them with necessary standard wear and apparel consistent with the nature of work being executed by his workmen.

xiv) The contractors shall ensure the safety of his workmen by posting necessary flagman, whose job will be to caution the workmen of approaching trains, when his workmen work on or near running Railway tracks.

xv) The contractors shall protect the site of work, e.g. excavated areas, by adequate fencing and/or other suitable means to prevent accidents to his own workmen, BBJ men or any member of the public.

xvi) Should any accident takes place, the total cost of such damage including the cost of treatment, loss and/or compensation shall be payable by the contractor. In case of BBJ under any circumstance or law of the country pays such damage; the same shall be fully recovered from the Contractor(s) due.

31.2 The area of work should be demarcated by providing barricades and signboard, which will enable the workmen posted at site and also the lorry drivers to have clear guidelines of movement of vehicles.

31.3 The operators and supervisors of the contractor engaged in such work which have bearing on safety on running train may have to undergo training, as per the decision of Engineer-in-charge, in Railway's Zonal Divisional or other Training Schools so that they get acquainted with the safety required safety precaution. The cost of the training shall be borne by the contractor.

31.4 Whenever the contractor is working near the existing open line and he desires to use unmanned level crossings for frequent of his vehicles, machinery equipment etc., he should put in a request to the BBJ administration for deputing adequate number of flagmen to ensure safety the cost of which will be borne by the contractor as per rules.

31.5 Suitable gates/barriers should be installed across the new embankment, preferably adjoining the manned/unmanned level crossings. The entry for the vehicles should be regulated by an authorized representative of the Engineer-in-charge during the working hours.

31.6

Vehicles and Equipments of contractor/s can be drafted by the BBJ/Railway Administration in case of Accidents/ Natural Calamities involving human lives.
For payment purpose, this item will be operated as a Non-Schedule (NS) item as per Clause 39 of General Conditions of Contract and Indian Railway Unified Standard Specification Volume I & II 2010 edition.

32.0 LABORATORY AT SITE

32.1 The contractor shall also establish a self sufficient quality control laboratory before physical start of work to carry out necessary test for the quality control of the earthwork, design and quality control of concrete mix such other related tests as may be necessary and desirable in the interest of the work. In the event of failure of the contractor even after giving 7 days' notice to contractor to provide a site laboratory with necessary equipment and technical personnel, BBJ shall be within its rights to take further action in terms of G.C.C. Further, cost of tests and all incidental and departmental charges etc. carried out at any other approved laboratory/test house shall be borne by the contractor.

32.2 The Engineer may however; at his discretion for work costing more than Rs.50.0 lakhs allow the tests to be carried out in any other approved laboratory under the supervision of his representative. All the tests, in such case, shall be got done by the contractor at his own cost including cost of transporting the specimen to the laboratory, and any other incidental charges.

32.3 The decision of the Engineer in regard to the selection of the laboratory shall be final.

32.4 Departmental Officials concerned with contract shall be entitled at any time to inspect and examine materials intended to be used in or on the works, either on the site or at factory or workshop or other place(s) where such materials are assembled, fabricated or manufactured or at any place(s) where these are lying or from which these are being obtained and the contractor shall give such facilities as may be required for such inspection and examination.

33.0 MEASUREMENT CERTIFICATE AND PAYMENT.

33.1 The quantity of work done which is duly certified by N.F. Rly shall only qualify for payment after receipt of corresponding payment against the said certified work from N.F. Rly. BBJ shall release payment to the contractor within 30 (thirty) days from the date of receipt of payment from N.F. Rly aforesaid.
This clause shall override any contrary provision regarding payment in this tender.

34.0 INCOME TAX.

34.1 In pursuance of Finance Act 1972 introducing section 194-C in the Income Tax Act 1961 providing deduction of income tax at source from income comprised in payment made to the contractor for carrying out any work or supply of labour for carrying out any work, the BBJ Administration shall be entitled to deduct 2% (Two percent) of gross payment of any sum paid after 31st May, 1972 to the contractor as Income Tax plus surcharge on the amount of Income Tax, whenever regulated from time to time.

34.2 The contractor(s) are requested to submit the details as per the proforma attached (**Annexure –H**)

35.0 GOODS AND SERVICE TAX (GST)

35.1 Without prejudice to stipulation in General Conditions of Contract, the quoted price shall be exclusive of **Goods and Service Tax.** The GST as legally leviable & payable by the bidder under the provisions of applicable law/ act shall be paid

extra by BBJ as per bidder's bill. Bidder shall quote their rate after considering the input tax credit on their input materials and services.

35.2 The bidder shall get registered with the GST authorities and the registration certificate shall be submitted along the bid documents (techno commercial). Bid without GST number shall be cancelled.

35.3 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**.

35.4 **Bidder shall raise their tax invoice in regular interval as per contract condition and uploaded 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 bidder, the same shall be recovered from Bidder's bill**.

35.5 In case Government imposes any new levy/ tax after award 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 is applicable to this contract.

36.0 SECURITY DEPOSIT (SD)

36.1 The Earnest Money deposited by the successful Tenderer/ Contractor along with his tender will be retained by the BBJ as part of security for the due and faithful whatsoever of the contract by the Contractor. The balance to make up the security deposit the rates for which are given below, may be deposited by the Contractor in the form of Demand Draft/ Pay Order or may be recovered by percentage deduction from the Contractor's "On Account" bills. Provided also that in case of defaulting contractor BBJ may retain any amount due for payment to the Contractor on the pending "On Account Bills" so that the amounts so retained may not exceed 10% of the total value of the contract.

36.2 Unless otherwise specified in the special conditions, if any the security deposit/rate of recovery/mode of recovery shall be as under:-

a) Security Deposit for each work should be 5% of the Contract value.

b) The rate of recovery should be at the rate of 10% of the RA bill amount till the full Security Deposit is recovered.

c) Security Deposits will be recovered only from the running bills of the contract and no other mode of collecting SD such as SD in the form of instruments like BG, FD etc. shall be accepted towards Security Deposit. However, in case of contract of value of Rs 50.00 Cr or above, irrevocable Bank Guarantee of suitable validity can also be accepted as a mode of obtaining security deposit.

36.3 Security Deposit shall be returned to the contractor after the physical completion of the work and after the expiry of maintenance period and after passing the final bill based on "No Claim Certificate" by the Competent Authority. The Competent Authority shall normally be the authority who is competent to sign the contract. If this Competent Authority is of the rank lower than JA Grade Officer, then a JA Grade Officer (Concerned with the work) should issue the certificate. The 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. Before releasing the SD, an unconditional and unequivocal "No Claims Certificate" from the contractor concerned should be obtained. However, after the work is physically completed, security deposit recovered from the running bills of a contractor can be returned to him if he so desires, in lieu of irrevocable Bank Guarantee with validity as decided by

the BBJ for equivalent amount to be submitted by him.

36.4 No interest will be payable upon the Earnest Money and Security Deposit or amounts payable to the contractor under the contract.

37.0 PERFORMANCE GUARANTEE (PG)

The procedure for obtaining Performance Guarantee is outlined below:

a. For due and faithful fulfillment of the contractual obligations, the successful bidder shall furnish a Performance Guarantee (PG) for an amount equivalent to **5% (five percent)** of the contract price/value of work order either by Bank Draft 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 in the prescribed format of BBJ. The aforesaid Bank Guarantee should be submitted within **45 (forty-five) 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 PG is not submitted within 45 days.

b. Provided further that on specific request from the bidder, the said period of 45 (forty-five) days for submission of PG may be extended up to 75 (seventy-five) days from the date of issue of LOA at the sole discretion of the Competent Authority of BBJ. However, a penal interest of 15% (fifteen percent) per annum shall be charged for the delay beyond 45 (forty-five) days, i.e. from 46th day after the date of issue of LOA. In case the bidder fails to submit the PG even within the extended period aforesaid the bid of the bidder shall be liable for rejection by the BBJ administration and the LOA shall stand withdrawn.

c. The P.G. 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 contractor shall get the validity of P.G. 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 (PG) within the stipulated period of 45 days or extended period up to 75 days, as the case may be, from the date of issue of LOA, and his bid is consequentially cancelled and the LOA is withdrawn the defaulting bidder shall be debarred from participating in Re-Tender for that work and his EMD shall be forfeited.

e. The formal Work Order shall be issued/ contract agreement shall be executed within a reasonable time only after receipt of PG from successful bidder. Till such time the work order is issued/contract agreement is executed the contractor shall execute the work on the strength of LOA but no payment shall be made to the contractor without work order/ contract agreement. In the event the bid is cancelled and LOA is withdrawn due to non-submission of PG, the contractor shall have no claim for the executed work if any as aforesaid.

f. The value of PG originally submitted by the successful bidder need not be changed for a variation of contract price/ work 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) for the excess value over the original contract value shall be deposited by the successful bidder.

g. The Performance Guarantee (PG) shall be released after physical completion of the work plus after completion of 60 days thereafter based on 'Completion Certificate' issued by the competent authority stating that the contractor 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, the Security Deposit shall be forfeited and the Performance Guarantee shall be encashed. The balance work shall be got done independently without risk & cost of the failed contractor. The failed contractor shall be

debarred from participating in the tender for executing the balance work. If the failed contractor 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 Contract (notwithstanding and/or without prejudice to any other provisions in the 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 which event BBJ may claim the full amount of the Performance Guarantee.
   (b) Failure by the successful bidder to pay BBJ any amount due, either as agreed by the contractor or determined under any of the Clauses/ Conditions of the Agreement, within 30 days of the service of notice to this effect by BBJ.
   (c) In the event of the Contract being rescinded under provisions of any of the clause/ condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the BBJ.

38. SUBMISSION OF BANK GUARANTEE

The Bank guarantee (BGs) to be submitted by Suppliers/Contractors should be sent directly to the concerned authorities by the issuing Bank under Registered post A.D.

39.0 PAYMENT OF ADVANCES TO CONTRACTORS:

No advances will be paid to contractor.

39.1 MOBILIZATION ADVANCE: (Applicable to Tender of value of Rs. 25.00 Crs. and above) No mobilization advances will be paid to contractor

40.0 DEFINITION AND INTERPRETATIONS.

In the Contract documents, the following terms shall have the meanings herein assigned to them except where the contract otherwise requires:

40.1 "**General Manager**" shall be the Officer in charge of the whole of the BBJ.

40.2 "**Engineer**" shall mean the Executive Engineer in executive charge of the work and shall include the superior Officer of the Engineering Department of the BBJ.

40.3 "**Construction plant**" shall mean all plants, machinery, vehicles, river vessels, tools, equipment, appliances or things of whatsoever nature required in or about execution, completion or maintenance of the works or temporary work but does not include materials or other things intended to or forming part of the permanent work.

40.4 A "**Day**" shall mean a day of 24 hours from midnight to mid night irrespective of the number of hours worked in that day.

40.5 A "**Week**" shall mean seven days without regard to the number of hours worked on any day in that week.

40.6 A "**Month**" shall mean Gregorian Calendar Month irrespective of the number of hours worked on any day in that month.

CHAPTER-IV

PRICE VARIATION CLAUSE
&
EMPLOYEES' PROVIDENT FUND

CHAPTER-IV

41.0 PRICE VARIATION CLAUSE

Clause 46A:- Price Variation Clause

46A.1 Price Variation Clause (PVC) shall be applicable only for **contracts** of value as prescribed by the BBJ through instructions/circulars issued from time to time and irrespective of the contract completion period. **Variation in quantities shall not be taken into account for applicability of PVC in the contract.**
Materials supplied free of cost by BBJ to the contractors shall fall outside the purview of Price Variation Clause. If, in any case, accepted offer includes some specific payment to be made to consultants or some materials supplied by BBJ free or at fixed rate, such payments shall be excluded from the gross value of the work for the purpose of payment/recovery of price variation.

46A.2 The Base Month for 'Price Variation Clause' shall be taken as month of opening of tender including extensions, if any, unless otherwise stated elsewhere. The quarter for applicability of PVC shall commence from the month following the month of opening of tender. The Price Variation shall be based on the average Price Index of the quarter under consideration.

46A.3 Rates accepted by BBJ Administration shall hold good till completion of work and no additional individual claim shall be admissible on account of fluctuations in market rates, increase in taxes/any other levies/tolls etc. except that payment/recovery for overall market situation shall be made as per Price Variation Clause given hereunder.

46A.4 Adjustment for variation in prices of material, labour, fuel, explosives, detonators, steel, concreting, ferrous, non-ferrous, insulators, zinc and cement shall be determined in the manner prescribed.

46A.5 Components of various items in a contract on which variation in prices be admissible, shall be Materials, Labour, Fuel, Explosives, Detonators, Steel, Cement, Concreting, Ferrous, Non-ferrous, Insulator, Zinc, Erection etc. However, for fixed components, no price variation shall be admissible.

46A.6 The percentages of labour component, material component, fuel component etc. in various types of Engineering Works shall be as under:

Component	Percentage	Component	Percentage
(A) Earthwork Contracts:			
Labour Component	50%	Other Material Components	15%
Fuel Component	20%	Fixed Component *	15%
(B) Ballast and Quarry Products Contracts:			
Labour Component	55%	Other Material Components	15%
Fuel Component	15%	Fixed Component *	15%
(C) Tunneling Contracts:			
Labour Component	45%	Detonators Component	5%
Fuel Component	15%	Other Material Components	5%
Explosive Component	15%	Fixed Component *	15%
(D) Other Works Contracts:			
Labour Component	30%	Fuel Component	15%
Material Component	40%	Fixed Component *	15%

* ***It shall not be considered for any price variation.***

46A.7 The Amount of variation in prices in several components (labour material etc.) shall be worked out by the following formula.

(i) $L = \frac{R \times (I-I0)}{I0} \times \frac{P}{100}$

(ii) $M = \frac{R \times (W - W0)}{W0} \times \frac{Q}{100}$

(iii) $U = \frac{R \times (F - F0)}{F0} \times \frac{Z}{100}$

(iv) $X = \frac{R \times (E - E0)}{E} \times \frac{S}{100}$

(v) $N = \frac{R \times (D - D0)}{D0} \times \frac{T}{100}$

(vi) $Ms = O \times (Bs – Bso)$

(vii) $Mc = A \times (Wc - Wco)/Wco$

For Railway Electrification Works:

(viii) $Mcc = [(C - Co) /Co \times 0.4136] \times G$

(ix) $Mf = [(Sf - Sfo) /Sfo + (Z – Zo)/Zo \times 0.06] \times H$

(x) $Mnf = [(Cu - Cuo) /Cuo] \times J$

(xi) $Mz = [(Z - Zo) /Zo] \times W$

(xii) $MIn = [(In - Ino) /In] \times 85$

Where

L	Amount of price variation in Labour
M	Amount of price variation in Materials
U	Amount of price variation in Fuel
X	Amount of price variation in Explosives
N	Amount of price variation in Detonators
Ms	Amount of price variation in Steel
Mc	Amount of price variation in Cement
Mcc	Amount of price variation in Concreting
Mf	Amount of price variation in Ferrous
Mnf	Amount of price variation in Non-Ferrous
Mz	Amount of price variation in Zinc
Min	Amount of price variation in Insulator
O	Weight of steel in tones supplied by the contractor as per the 'on account' bill for the month under consideration
R	Gross value of work done by contractor as per on-account bill(s) excluding cost of materials supplied by BBJ at fixed price **minus the price values of cement & steel**. This will also exclude specific payment, if any, to be made to the consultants engaged by contractors (such payment will be indicated in the contractor's offer)
A	Value of Cement supplied by Contractor as per on account bill in the quarter under consideration
Io	Consumer Price Index Number for Industrial Workers – All India – Published in R.B.I. Bulletin for the base period
I	Consumer Price Index Number for Industrial Workers – All India –

	Published in R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration
Wo	Index Number of Wholesale Prices – By Groups and Sub-Groups – All commodities – as published in the R.B.I. Bulletin for the base period
W	Index Number of Wholesale Prices – By Groups and Sub-Groups – All commodities – as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration
Fo	Index Number of Wholesale Prices – By Groups and Sub-Groups for Fuel, Power, Light and Lubricants as published in the R.B.I. Bulletin for the base period
F	Index Number of Wholesale Prices – By Groups and Sub-Groups for Fuel, Power, Light and Lubricants as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration
Eo	Cost of explosives as fixed by DGS&D in the relevant rate contract of the firm from whom purchases of explosives are made by the contractor for the base period
E	Cost of explosives as fixed by DGS&D in the relevant rate contract of the firm from whom purchases of explosives are made by the contractor for the average price index of the 3 months of the quarter under consideration
Do	Cost of detonators as fixed by DGS&D in the relevant rate contract of the firm from whom purchases of detonators are made by the contractor for the base period
D	Cost of detonators as fixed by DGS&D in the relevant rate contract of the firm from whom purchases of detonators are made by the contractor for the average price index of the 3 months of the quarter under consideration
Bs	SAIL's (Steel Authority of India Limited) ex-works price plus Excise Duty thereof (in rupees per tonne) for the relevant category of steel supplied by the contractor as prevailing on the first day of the month in which the steel was purchased by the contractor (or) as prevailing on the first day of the month in which steel was brought to the site contractor whichever is lower
Bso	SAIL's ex-works price plus Excise Duty thereof (in Rs. Per tonne) for the relevant category of steel supplied by the contractor as prevailing on the first day of the month in which the tender was opened
Wco	Index No. of Wholesale Price of sub-group (of Cement) as published in RBI Bulletin for the base period
Wc	Index No. of Wholesale Price of sub-group (of Cement) as published in RBI Bulletin for the average price index of the 3 months of the quarter under consideration
C	RBI wholesale price index for cement for the month which is six months prior to date of casting of foundation
Co	RBI wholesale price index for cement for the month which is one month prior to date of opening of tender
Z	IEEMA price for Zinc for the month which is two months prior to date of inspection of material
Zo	IEEMA price for Zinc for the month which is one month prior to date of opening of tender
	IEEMA price for Copper wire bar for the month which is two months prior to date of inspection of material
	IEEMA price for Copper wire bar for the month which is one month prior

Cu to date of opening of tender

Cuo IEEMA price index for Iron & Steel for the month which is two months prior to date of inspection of material

Sf IEEMA price index for Iron & Steel for the month which is one month prior to date of opening of tender

Sfo RBI wholesale price index for Structural Clay Products for the month which is two months prior to date of inspection of material

In RBI wholesale price index for Structural Clay Products for the month which is one month prior to date of opening of tender

Ino

P	% of Labour component
Q	% of Material component
Z	% of Fuel component
S	% of Explosive component
T	% of Detonators component
G	% of Concreting component
H	% of Ferrous component
J	% of Non-Ferrous component
W	% of Zinc component

46A.8 The demands for escalation of cost shall be allowed on the basis of provisional indices made available by Reserve Bank of India. Any adjustment needed to be done based on the finally published indices shall be made as and when they become available.

46A.9 Relevant categories of steel for the purpose of operating price variation formula, as mentioned in this Clause, based on SAIL's ex-works price plus Excise Duty thereof, shall be as under:

SL	Category of Steel Supplied in Railway Work	Category of Steel Produced by SAIL whose Ex-Works Price Plus Excise Duty would be adopted to determine Price Variation
1	Reinforcement bars and other rounds	TMT 8mm IS 1786 Fe 415/Fe 500
2	All types and sizes of angles	Angle 65 x 65 x6 mm IS 2062 E250A SK
3	All types and sizes of plates	PM Plates above 10-20 mm IS 2062 E250A SK
4	All types and sizes of channels and joists	Channels 200 x 75 mm IS 2062 E250A SK
5	Any other section of steel not covered in the above categories and excluding HTS	Average of price for the 3 categories covered under SL 1, 2 & 3 above.

46A.10 **Price Variation During Extended Period of Contract**

The price adjustment as worked out above, i.e. either increase or decrease shall be applicable up to the stipulated date of completion of work including the extended period of completion where such extension has been granted under Clause 17-A of the General Conditions of Contract. However, where extension of time has been granted due to contractor's failure under Clause 17-B of the General Conditions of Contract, price adjustment shall be done as follows:

(a) In case the indices increase above the indices applicable to the last month of original completion period or the extended period under Clause 17-A, the price adjustment for the period of extension granted under Clause 17-B shall be limited to the amount payable as per the Indices applicable to the last month of the original completion period or the extended period under Clause 17-A of the

General Conditions of Contract; as the case may be.

(b) In case the indices fall below the indices applicable to the last month of original/extended period of completion under Clause 17-A, as the case may be; then the lower indices shall be adopted for the price adjustment for the period of extension under Clause 17-B of the General Conditions of Contract.

42.0 MAINTENANCE PERIOD

42.1 On the completion of work to the satisfaction of the Engineer it will be taken over from the contractor From the date of taking over the contractor shall be responsible for the maintenance of all works for further period of **6 (Six)** months but it must cover the period of one monsoon from Ist June to 30 November.

42.2 To cover up monsoon period, the maintenance period will be extended in cases when required and contractor shall remain responsible for maintenance for this extended period also. The contractor shall make good and remedy at his own expense within such period as may be stipulated by the Engineer, any defect which may develop or may be before the expiry of this period of twelve months and intimation of which has been sent to contractor within seven days of the expiry of the said period by a letter, sent by hand delivery or by registered post. In case the contractor fails to make adequate arrangements to rectify the defects within seven days of the receipt of such notices, the Engineer without further notice may make his own arrangement to rectify the defects and the cost of such rectification shall be recovered from the Security Deposit of the contractor or from any other money due to the contractor under this or may other contract.

43.0 CONTRACT LABOUR ACT

43.1 The contractor shall observe all the provisions of the Contract Labour (Regulation and Abolition) Act1970 and Central Rules 1971 or any statutory modifications or re-engagements thereof for the time being in force and any rules and regulations made their under in respect of all the persons directly or through petty contractors or sub-contractors employed by him under this contract and shall indemnify the BBJ from and against any claims under the Contract Labour (Regulation and Abolition) Act 1970 and Central Rules 1971 or any further rules and regulations framed there under, by or on behalf of any person directly or through petty contractors or sub-contractors employed by him or otherwise.

43.2 The contractor shall obtain license from the Licensing Officer specified in the Act, paying necessary license fee as per section 12 of the Act 1970 and Rules 26 of the Central Rules 1971. In every case in which by virtue of section 20(2) and 21(4) of the Contract Labour (Regulation and Abolition) Act 1970, the BBJ is obliged to provide amenities or pay wages to Labour.

43.3 Employed by the contractor in executing the work, the BBJ will recover from the contractor the expenditure so incurred by the BBJ or wages so paid, and without prejudice to the right of the BBJ under section 20(2) and 21(4) of the said Act, the BBJ shall be at liberty to recover such amounts or part thereof by deducting it from the security deposit or from any sum due to the BBJ by the contractor whether under this or any other contract/contracts.

43.4 The attention of the tenderer is drawn to the Contract Labour (Regulation & Abolition) Act, 1970. Contract Labour (Regulation & Abolition) General Rules 1971 and Clause 55 (2)(i) of the Northeast Frontier Railway Engineering Department Regulation for Tenderers and Contract General Conditions of Contract 1998 and Standard Special Conditions of Contract 1998 edition. Successful tenderer(s) shall comply with the provisions of the said Act and Rules, the Executive Engineers/Dy. Chief Engineers being the principal

employers under the said Act and Rules.

43.5 The attention of the tenderer is also drawn to the rules of the Inter State Migrant Workman (Regulation of employment conditions of service) Central rules 1980. The successful tenderers should comply with these rules as per the said Act/1979 (ACF NO. 30 of 1979) with central rules 1980.

43.6 Provided that if any dispute arises as to the expenditure incurred by the BBJ in the provision of amenities under the said Act, the decision of the Engineer thereon shall be final and binding.

44.0 Building and Other Construction Workers Act, 1996 and: The salient features of the Act are as follows:-

i) It applies to every establishment which employs, or had employed on any day of the proceeding twelve months, ten or more building workers in any building or other construction work.

ii) The cess shall be levied and collected @ 1% of the cost of construction incurred by an employer.

iii) For the purpose of levy of cess, cost of construction shall include all expenditure incurred by an employer in connection with the building or other construction work but shall not include cost of land; and any compensation paid or payable to a worker or his kin under the Workmen's Compensation Act, 1923.

iv) Every building worker who has been engaged in any building or other construction work for not less than 90 days during the preceding twelve months is required to be registered as a beneficiary under this Act.

v) This will be applicable from the date of receipt of notice from State Labour Commissioner/ Labour Department.

44.1 The tenderer/contractor for carrying out any construction work in **Mizoram** State must get themselves registered from the Registering Officer under Section-7 of the Building and Other Construction Workers Act, 1996 and rules made thereto by the **Mizoram** State Government and submit certificate of Registration issued from the Registering Officer of the State Government (Labour Department). For enactment of this Act, the tenderer shall be required to pay cess @ 1% of cost of construction work to be deducted from each bill. Cost of material shall be outside the purview of cess, when supplied under a separate schedule item.

45.0 **ANTI-MALARIA PRECAUTIONS.**

45.1 Every precaution shall be taken by the contractor to prevent the breeding of mosquitoes at the site of work during construction and all reacceptance used for the storage of water must be suitably protected for this purpose or must be emptied at the close of the work every day. As a precautionary measure against Malaria all water used for curing the concrete and masonry works must contain specified creosol in solution, which must not be less than 1:200 or more than 1:100 so that the solution will have markedly cloudy appearance and will give a reasonably strong odour.

45.2 As a precaution to any measure against Malaria the contractor will be responsible to take up anti-larval work at his own expense during the currency of the contract. In case of contractor's failure to undertake the job, the expenditure incurred if any by the BBJ on this account is recoverable from the defaulting contractor without any reference

46.0 **ARBITRATION**.

46.1 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 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 a notice in writing to the Competent Authority of BBJ clearly evince the intention to refer the disputes and differences that have arisen between the parties to Arbitration by 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 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.

47.0 **Modified Clause of GCC**

Clause 26: Provision of efficient and competent staff at work sites by the contractor.

47.1 The Contractor shall place and keep on the works at all times efficient and competent staff to give the necessary directions to his workmen and to see that they execute their work in sound & proper manner and shall employ only such supervisors, workmen & labourers in or about the execution of any of these works as are careful and skilled in the various trades.

47.2 The Contractor shall at once remove from the works any agents, permitted sub-contractor, supervisor, workman or labourer who shall be objected to by the Engineer and if and whenever required by the Engineer, he shall submit a correct return showing the names of all staff and workmen employed by him.

47.3 In the event of the Engineer being of the opinion that the Contractor is not employing on the works a sufficient number of staff and workmen as is necessary for proper completion of the works within the time prescribed, the Contractor shall forthwith on receiving intimation to this effect deploy the additional number of staff and labour as specified by the Engineer within seven days of being so required and failure on the part of the Contractor to comply with such instructions will entitle the BBJ to rescind the contract under Clause 62 of these conditions.

Clause 26A: Deployment of qualified Engineers at work sites by the contractor.

47A.1 The Contractor shall also employ Qualified Graduate Engineer or Qualified Diploma Holder Engineer, based on value of contract, as may be prescribed by the BBJ through separate instructions from time to time.

47A.2 In case the Contractor fails to employ the Engineer, as aforesaid in Para 47A.1, he shall be liable to pay penalty at the rates, as may be prescribed by the BBJ through separate instructions from time to time for the default period for the provisions, as contained in Para 47A.1

47A.3 No. of qualified engineers required to be deployed by the Contractor for various activities contained in the works contract shall be specified in the tender documents as 'special condition of contract' by the tender inviting authority.

47.4 In terms of provisions of new Clause 47A.1 to the General Conditions of Contract (GCC), contractor shall also employ following Qualified Engineers during execution of the allotted work:

(a) One Qualified Graduate Engineer when cost of work to be executed is Rs. 200 lakh and above, and

(b) One Qualified Diploma Holder Engineer when cost of work to be executed is more than Rs. 25 lakh, but less than Rs. 200 lakh.

47.5 Further, in case the contractor fails to employ the Qualified Engineer, as aforesaid in Para 3 above, he, in terms of provisions of Clause 47A.2 to the General Conditions of Contract, shall be liable to pay an amount of Rs.40,000 and Rs.25,000 for each month or part thereof for the default period for the provisions, as contained in Par 3(a) and 3(b) above respectively.

Clause-52– **Withholding And Lien In Respect Of Sums Claimed:** Wherever any claim or claims for payment of a sum of money arises out of or under the contract against contractor the BBJ shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security if any deposited by the contractor and for the purpose aforesaid the BBJ shall be entitled to withhold the said cash Security Deposit or the Security if any furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor the BBJ shall be entitled to withhold and have a lien to the extent of the such claimed amount or amounts referred to supra from any sum or sums found payable or which at any time thereafter may become payable to the contractor under the same contract or any other contract with this or any other BBJ or any Department of the Central Government pending finalization or adjudication of any such claim. It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the BBJ will be kept withheld or retained as such by the BBJ till the claim arising out of or under the contract is determined by the Arbitrator (if the contract governed by the Arbitration Clause) or by the competent Court as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to supra and duly notified as such to the contractor. For the propose of this Clause where the contractor is a Partnership Firm or a Limited Company the BBJ shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in a part from any sum found payable to any Partner/Limited Company as the case may be whether in his individual capacity or otherwise.

Clause 52-A **Lien in Respect Of Claims in Other Contract:**

(i) Any sum of money due and payable to the contractor (including the Security

Deposit returnable to him) under the contract may be withheld or returned by way of lien by the BBJ, against any claim of this or any other BBJ or any other Department of the Central Government in respect of payment of a sum of money arising out of or under any other contract made by the contractor with this or any other Department of the Central Government.

(ii) However, recovery of claims of BBJ in regard to terminated contracts may be made from the Final Bills, Security Deposits and Performance Guarantees of other contract or contracts executed by the contractor. The Performance Guarantees submitted by the Contractor against other contracts, if required, may be withheld and encashed. In addition, 10% of each subsequent 'on-account bill' may be withheld, if required, for recovery of BBJ's dues against the terminated contract.

(iii) It is an agreed term of the contract that the sum of money so withheld or retained under this Clause by the BBJ will be kept withheld or retained as such by the BBJ till the claim arising out of or under any other contract is either mutually settled or determined by arbitration, if the other contract is governed by Arbitration Clause or by the competent Court as the case may be and contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this Clause and duly notified as such to the contractor.

Clause 63. Matters finally determined by the BBJ – All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract, shall be referred by the contractor to the General Manager and the General Manager shall within 120 days after receipt of the contractor's representation make and notify decisions on all matters referred to by the contractor in writing provided that matters for which provision has been made in relevant clauses General Conditions of Contract or in any clause of the special conditions of the contract shall be deemed as 'excepted matters' (matters not arbitrable) and decision of the BBJ authority, thereon shall be final and binding on the contractor provided further that 'excepted matters' shall stand specifically excluded from the purview of the arbitration clause.

51.0 LAWS GOVERNING THE CONTRACT

This contract shall be governed by the Laws of India for the time being in force. Irrespective of place of working, the place of performance or place of payment under the contract, the contract shall be deemed to have been made at the place from which the acceptance of the tender has been issued.

52.0 JURISDICTION OF COURT.

52.1 The Courts at Kolkata shall have the exclusive jurisdiction to try all disputes, if any, arising out of this agreement between the parties.

53.0 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, 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 by reason 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 by reason 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 equipments, 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.

54.0 Photograph, site record and video film of work during execution of works for important bridges etc.

53.1 The successful tenderer will be required to prepare video film recording of entire construction and edit the same with proper commentary. The same shall cover the whole work in duration of about 90 minutes. This film shall pictorially represent the entire construction of foundation, substructure and superstructure starting from beginning to end of work. Two copies of video film in CD shall be handed over to the BBJ along with the necessary details, instructions, literature etc. The rates for works of foundation, substructure and superstructure will be inclusive of the cost of such filming.

54.0 **Provision of vehicle for supervision:**

The successful tenderer will be required to provide well maintained vehicle with licensed driver and fuel for supervision and inspection of works by BBJ/Railways field engineers on day to day basis.

55.0 **Employees' Provident Fund:**

Clause 55-B to GCC: Provisions of Employees Provident Fund and Miscellaneous Provisions Act, 1952.

The Contractor shall comply with the provisions of Para 30 and 36-B of the Employees Provident Fund Scheme, 1952; Para 3 and 4 of Employees' Pension Scheme, 1995; and Para 7 and 8 of Employees Deposit Linked Insurance Scheme, 1976; as modified from time to time, wherever applicable and shall also indemnify the BBJ from and against any claims under the aforesaid Act and the Rules".

Employees' Provident Fund Scheme, 1952:

30.**Payment of Contributions**:

(1) The employer shall, in the first instance, pay both the contribution payable by himself (in this Scheme referred to as the employer's contribution) and also, on behalf of the member employed by him directly or by or through a contractor the contribution payable by such member (in this Scheme referred to as the member's contribution).

(2) In respect of employees employed by or through a contractor, the contractor shall recover the contribution payable by such employee (in this Scheme referred to as the member's contribution) and shall pay to the principal employer the amount of member's contribution so deducted together with an equal amount of contribution (in this

Scheme referred to as the employer's contribution) and also administrative charges.

(3) It shall be the responsibility of the principal employer to pay both the contribution payable by himself in respect of the employees directly employed by him and also in respect of the employees employed by or through a contractor and also administrative charges.

{**Explanation** : For the purposes of this paragraph, the expression " administrative charges" means such percentage of the pay (basic wages, dearness allowance, retaining allowance, if any, and cash value of flood concessions admissible thereon) for the time being payable to the employees other than an excluded employee, and in respect of which Provident Fund Contribution are payable as the Central Government may, in consultation with the Central Board and having regard to the resources of the Fund for meeting its normal administrative expenses fix.}

36-B: **Duties of Contractors**:

Para 3(1): From and out of the contributions payable by the employer in each month under Section 6 of the "Act" or under the rules of the Provident Fund of the establishment which is exempted either under clauses (a) and (b) of sub-section (1) of Section 17 of the Act or whose employees are exempted under either paragraph 27 or paragraph 27-A of the Employees' Provident Fund Scheme, 1952, a part of contribution representing 8.33 per cent of the Employee's pay shall be remitted by the employer to the Employees' Pension fund within 15 days of the close of every month by separate bank draft or cheque on account of the Employees' Pension Fund contribution in such manner as may be specified in this behalf by the Commissioner. The cost of the remittance, if any, shall be borne by the employer.

Para 3(2): The Central Government shall also contribute at the rate of 1.16 per cent of the pay of the members of the Employees' Pension Scheme and credit the contribution to the Employees' Pension Fund:

Provident that where the pay of the member exceeds Rs. 6,500 (Rupees Six thousand and five hundred) per month, the contribution payable by the employer and the Central Government be limited to the amount payable on his pay of Rs.6,500 (Rupees Six thousand and five hundred) only.

Para 4 : **Payment of Contribution**:

(1) The employer shall pay the contribution payable to the Employees' Pension Fund in respect of each member employed by him directly or by or through a contractor.

(2) It shall be the responsibility of the principal employer to pay the contributions payable to the Employees' Pension Fund by himself in respect of the employees directly employed by him and also in respect of the employees employed by or through a contractor.

Employees' Deposit Linked Insurance Scheme, 1976:

Para 7 : Contribution :

(1) The contribution payable by the employer and the Central Government under sub-section (2) and sub-section (3) of Section 6-C of the Act, shall be calculated on the basis of the basic wages dearness allowance (including the cash value of any food concession) and retaining allowance, if any, actually drawn during the whole month whether paid on daily, weekly, fortnightly or monthly basis.

(2) Provided that where the monthly pay of an employee exceeds six thousand five hundred rupees, the contribution payable in respect of him by the employer and the Central Government shall be limited to the amounts payable on a monthly pay of six thousand five hundred rupees

including dearness allowance, retaining allowance (if any) and cash value of food concession.

Para 8 : **Mode of Payment of Contribution** :

(1) The contribution by the employer shall be remitted by him together with administrative charges at such rate as the Central Government may fix from time to time under sub-section 4 of Section 6-C of the Act, to the Insurance Fund within fifteen days of the close of every month by a separate bank draft or cheque or by remittance in cash in such manner as may be specified in this behalf by the Commissioner. The cost of remittance, if any, shall be borne by the employer.

(2) It shall be the responsibility of the employer to pay the contribution payable by himself in respect of the employees directly employed by him and also in respect of the employees employed by or through a contractor.

CHAPTER-V
Plant & Equipment
&
Deployment of Key Personnel,
Forms & Annexures

CHAPTER-V

Annexure-A

CREDENTIALS OF THE TENDERER

(A) **General:**

(i)	Name of the Company/Contractor	:	
(ii)	Address of Registered office	:	
(iii)	Constitution of the Company	:	
(a)	Whether Pvt. Ltd.,, Public Ltd. Partnership or any other type		
(b)	Whether JV/Consortium	:	
(c)	Name and address JV/Consortium	:	

(B) **Experience:**

(i) No. of years the firm has been in operation under its present name :

(ii) Details of work executed/being executed by the tenderer in the last seven years. :

(iii) Testimonials from client's company on various works executed/being executed for the last three years. :

(Details of works executed/under execution in the last seven years)

Sl. No.	Name of work & W/O number	Clients Address	Estt. Value	Specified date of completion	Present status/ completed on	
					Completed value	date

(C) **Financial Position :**

Financial Turnover during the last three years (Copies of Audited Annual report, Accounts or a statement duly certified by a chartered accountant should be enclosed).

Year	Turnover (Rs. in lakhs)

(D) **Technical Capability:**

(i) List of tools, Plants, equipment and machinery available with the tenderer along with their value (A copy approved Assessor's Certificate to be enclosed).

(ii) Name, qualifications of the technical Supervisors and staff under the employment of the tenderer and organization on hand and proposed to be engaged for the subject work.

(iii) Other facilities available with the tenderer not covered hither to:

(E) Tenderer(s) knowledge from actual personal investigation of the resources of the region or District(s) in which he offers to work:

(F) Any other details that the tenderer may like to furnish to substantiate their financial and technical ability to undertake this work and complete the same within stipulated period of completion.

Table-A

LIST of KEY PLANT & EQUIPMENT TO BE DEPLOYED AT SITE for Cantilever Erection of Bridges

At Receiving and Assembling Yard

Sl. No.	Description	Nos. required at each end	Total Nos. required per bridge
1	Crane for unloading fabricated materials (also to be used for assembling steelwork) 15 t capacity at 15 m radius	1	2
2	Bogies for transporting materials from yard to erection point capacity 20t	2	4
3	Compressor 12 cum/min	1	2
4	Generator 63 KVA	1	2
5	Truck 10 t capacity	2	4
6	Riveting Equipment	3 sets	6 sets
7	Gas cutting equipment	1 set	2 sets
8	Welding equipment	1 set	2 sets
9	Small tools and tackles	1 lot	2 lots
10	Service Bolts and Drifts	As reqd.	As reqd.

Erection Point

Sl. No.	Description	Nos. required at each end	Total Nos. required per bridge
1	Erection Crane (custom built light weight) Capacity 20 t and 15 m radium	1	2
2	Compressor 25 cum/min	1	2
3	Generator 90 KVA	1	2
4	Riveting Equipment	8 sets	16 sets
5	Gas cutting equipment	1 set	2 sets
6	Wielding equipment	1 set	2 sets
7	Small tools and tackles	1 lot	2 lots
8	Service Bolts and Drifts	As reqd.	As reqd.
9	Trestles 2 m x 2 m x 2 m – approx.	250 (1 set)	500 (2 sets)
10	Bracings for above	To suit	To suit
11	Temporary steel (to be designed and tonnages determined)		

	(i) Links (ii) Link props (iii) Link bracings (iv) Verticals (v) Link Pins (vi) Buffer blocks (vii) Buffer slabs (viii) Hanging Device with Jacks	As reqd.	As reqd.
12	Hydraulic Jacks Enerpac or equivalent 250 t capacity	4 Nos.	8 Nos.

Note:

1.0 The above mentioned Plant & Equipment must be deployed at least 6 months before scheduled completion of the work.

2.0 Failure to deploy the above scale of equipment shall attract penalty @ Rs. 5000/- per day per No. of Crane and Rs.1000/- per day per No./set for other items.

Table-B

Deployment of Key Erection personnel for Cantilever erection:

Note: In bridge erection, especially over heights as necessitated in the subject bridge(s), it is extremely important that all the workers are skilled and experienced as otherwise; one person's incompetence may cause a major accident endangering all other workers not to mention material damage. Therefore, as a rule no unskilled labour should be allowed to work on the bridge proper; they can only work in the yard.
The contractor shall deploy the following minimum key personnel during the execution of Contracted work at least 6 months

A. At Receiving and Assembling Yards

Sl. No.	Description	Total Nos. required per bridge
1	Yard Engineer with min of 10 years' experience in fabrication and assembly of steelwork	2
2	Foreman with min of 10 years' experience in fabrication and assembly of steelwork	2
3	Crane operator with min. 5 years' experience	2

B. At Erection Points

1	Erection Engineer with min of 10 years' experience in Steel Bridge Erection and experience in erecting at least 2 bridges by cantilever erection	2
2	Foreman with min of 10 years' experience in Steel Bridge Erection and experience in erecting at least 2 bridges by cantilever erection	2
3	Electro Mechanical Supervisor with min. 10 years' experience in handling electrical and mechanical equipment, pipe lines etc	2
4	Crane operator with min. 10 years' experience of handling steelwork and working at heights	2
5	Engineer (Riveting) with min. 5 years' experience in supervising bridge riveting	2

6	Foreman (Riveting) with min. experience of 10 years in bridge steelwork riveting	2

C. In addition to the above, there shall be a Safety Engineer at site with at least 5 years experience in Steel Bridge Erection.

NOTE:

1.0 The Biodata (Name, Qualification, Years of experience etc.) of the key personnel as mentioned above, who are proposed to be deployed, shall be furnished in the tender offer. It will be essential to retain the same key personnel for continuity of the project. However, in case a situation arises to replace the key personnel for whatever reason, the same will be done in consultation with the BBJ's.

2.0 The key personnel should be available at site whenever required by the Engineer to take instructions. Incase the Contractor fails to employ the aforesaid key personnel a reasonable amount, not exceeding a sum of Rs. 25000/-, shall be deducted from the bills of works (including other works) payable to the contractor for each month of default in case of items 1 & 2 of Para A & B Viz. (A – At Receiving & Assembling Yards and B – At Erection points) and Rs. 15000/- for each month of default in other cases.

3.0 Apart from the above the contractor shall deploy minimum 200 Nos. of Skilled/Semi-skilled reinforcement labour and 150 Nos. of Skilled/Semi-skilled piling labour w.e.f. D21. Incase the Contractor fails to deploy the aforesaid Skilled/Semi-skilled labour a reasonable amount, not exceeding a sum of Rs. 300/- , shall be deducted from the bills of other works payable to the contractor for each day of default per each labour.

4.0 The decision of the engineer as to the period for which the required key personnel labour were not employed by the Contractor and as to the reasonableness of the amount to be deducted on this account shall be final and binding on the Contractor.

Annexure-B.

DECLARATION FORM

I/We hereby certify that -

(i) I am/We are not related to any employed in the Gazetted and /or non-gazetted capacity in the Engineering and or any other Department of the BBJ.

(ii) I/We draw attention to the fact that I am/We are related to the following employee(s) in the Gazetted and/or non-gazetted capacity in the Engineering and any other Department of the BBJ.

(iii)

S/No.	Name of the Employee(s)	Designation & Department	Degree of Relationship

Note: The item, which is not applicable, should be struck out.

SIGNATURE OF CONTRACTOR (S)

Name: _____

Address: _____

ANNEXURE –C

BBJ
Name of work: As per schedule.

Schedule of Deletion/Alteration (By BBJ)

Sl.No.	Clause No. of Std. Spl. Conditions of Contract.	Modifications applicable to this Tender/Contract.
1.	Clause 40 - Price Variation	Price Variation Clause- applicable as incorporated in Tender Document.
2.	Clause - 38 - Payment of Advance for Mobilization. (with sub-clause)	Mobilization Clause incorporated in the Tender Document.
3.	Clause - 39 – Advance Payment for Contractor's materials. (with sub clause)	As per GCC 1998 corrected up to date

Annexure- D

BBJ

Schedule of Deviations (By Tenderer)

Sl.No.	**Clause No. of Std. Spl. Conditions or Addl. Special Condition of Contract**	**Alternative acceptable to the tenderer**

ANNEXURE- E

FORM OF BANK GUARANTEE BOND FOR PERFORMANCE GUARANTEE

To
The Braithwaite Burn And Jessop Construction Company Limited,
(A Government of India Enterprise)
Registered Office –
27, R.N. Mukherjee Road,
Kolkata-700 001.

Dear Sir(s),

This guarantee executed this ____ day of _____, 2019 by _____ **BANK**, having its Registered Office at _____, Pin Code - _____, and acting through its branch office at _____, Pin Code - _____ (hereinafter referred to as **"the Bank"**) in favour of **THE BRAITHWAITE BURN AND JESSOP CONSTRUCTION COMPANY LIMITED**, a Government of India Enterprise and a company incorporated under the Companies Act, having its registered office at 27, R.N.Mukherjee Road, Kolkata – 700001 (hereinafter referred to as **"the Principal"**, which expression shall include its successors and assigns).

WHEREAS the Principal has placed a Work Order / Letter of Acceptance / Agreement No. _____, dated _____, for the work of _____ (hereinafter referred to as **"the said Work Order"**) in favour of **M/S.**_____ having its Registered Office at _____, Pincode - _____, (hereinafter referred to as **"the Contractor"**, which expression shall include its successors and assigns) and **WHEREAS** the Contractor has confirmed that they shall complete the said Work in time complying all the terms & conditions of the said Work Order issued by the Principal and **WHEREAS** the Contractor in terms of the said Work Order has agreed to submit to the Principal this Performance Bank Guarantee for Rs._____ /- (Rupees _____ only) in favour of the Principal for a period of _____ **months** (i.e. up to _____).

WHEREAS we _____ the Bank have been requested by the Contractor to issue this Performance Bank Guarantee of Rs._____ /- (Rupees _____ only) in favour of the Principal and we the Bank as the Guarantors are in agreement to do so.

NOW THIS BANK GUARANTEE WITNESSETH that in consideration of the aforesaid premises, we the Bank hereby confirm and undertake to pay to the Principal upon demand in writing whenever required by them to do so, such sum or sums of money not exceeding the said sum of Rs._____ /- (Rupees _____ only) arising out of any loss or damage suffered or that may be suffered by the Principal as a result of breach of any of the terms and conditions of the said Work Order on the part of the Contractor.

We, the Bank hereby agree that upon receiving a written demand from the Principal we shall immediately honour the said claim of the Principal and promptly pay the amount claimed under this Guarantee without any demur and the Principal shall not be questioned for any justification of such demand in any manner whatsoever.

We, the bank further agree that the guarantee herein contained shall remain in full force for the agreed period as said above and in the event of claims lodged by the Principal this Bank

Guarantee shall continue to remain enforceable till the Principal's claims are fulfilled or discharged by the Bank.

We, the bank do hereby undertake to indemnify and keep indemnified the Principal to the extent of Rs._____ /- (Rupees _____ only). We, the bank as the Guarantors, further agree that on a demand made by the Principal for honoring the Bank Guarantee, we have no right to refuse or decline such demand for any reason whatsoever. The fact that there is a dispute (in any manner whatsoever) between the Contractor and the Principal shall always have a right to enforce the Bank Guarantee unconditionally without any reference to the said Contractor.

We, the Bank, further agree that a mere written demand by the Principal is sufficient for us, to pay the amount covered by the Bank Guarantee without reference to the said Contractor and any protest by the Contractor cannot be valid ground for us, to decline payment to the Principal.

We, the Bank, further agree that the Guarantee herein contained shall remain in full force and effect for _____ months (i.e. up to _____).

It shall not be necessary for the Principal to proceed against the Contractor before proceeding against us, the Bank as the Guarantors and the guarantee herein contained shall be unconditionally enforceable against us, the Guarantors, notwithstanding any security which the Principal may have obtained or obtain from the Contractor at the time when proceedings are taken against us, the Guarantors, hereunder be outstanding or unrealized.

Provided always that we the Bank unconditionally undertake to renew this guarantee or to extend the period of guarantee from year to year before the expiry of the validity period or the extended period of the guarantee, as the case may be on being called upon to do so by the Principal and the cost related to this will be borne by the Contractor only. If the guarantee is not renewed or the period extended on demand, we the Bank shall pay the Principal the full amount or guarantee on demand and without demur.

We, the Bank lastly undertake not to revoke this Guarantee during its currency except with the
previous consent of the Principal in writing and agree that any change in the constitution of the
Contractor or the Bank shall not discharge our liability hereunder.

Notwithstanding anything contained herein:

(i) Our liability under this Bank Guarantee shall not exceed Rs._____ /- (Rupees _____ only).

(ii) This Bank Guarantee shall be valid up to _____ and for claim up to _____.

(iii) The Guarantee herein before contained shall not be affected in any way by any change in the constitution of the bank or of the Contractor.

(iv) We are liable to pay to the Principal the Guarantee amount or any part thereof under this Bank Guarantee only and only if the Principal serves upon us a written claim or demand, on or before _____.

Annexure -H

To
The Branch Manager,
SBI/PNB
(NEFT)

Sub:- Transfer of payment through NEFT.

The Bank Account(s) of the following payee(s) may kindly be credited through RTGS/NEFT as per statement given below for this purpose, Cheque No. dt.is being deposited in your Bank for a total amount of Rs. . The credit should be effected in the respective Bank Account positively. After completion of transaction, advise/report may be sent to BBJ, KOLKATA-700001 with intimation to the party.

SN	Party Name & Address	Bank Name	MICR/IFSC Code	Account No.	Type of Account

Annexure –I
(Para-16)

Programme for Completion:

Following programme of completion shall be adhered to by the agency for completion of the work:

Phase of Work	Time period elapsed since issue of LOA (as % of Completion Period)	Progress	
		During the Period	Cumulative up to end of the phase
I. (Initialisation)	10%	Mobilization & site clearance	Mobilization & site clearance
II (Start Up)	20%	10%	10%
III ((Momentous)	30%	10%	20%
IV (Stabilization)	50%	30%	50%
V (Consolidation)	75%	30%	80%
VI (Redemption)	95%	20%	100%
VII (Final)	100%	Finishing &Demobilization	Finishing & Demobilization

Progress commensurate with time elapsed will have to be maintained by the agency at any stage of work.

CHAPTER-VI

SPECIAL SPECIFICATION (GENERAL)

SPECIAL SPECIFICATION

1. GENERAL

1.1 These specifications shall apply to all such works as are required to be executed under the contract or otherwise directed by the Engineer. In every case the work shall be carried out to the satisfaction of the Engineer and shall conform to grades and cross sections shown on the drawings or as indicated by the Engineer. The quality of the work and materials shall comply with the requirements set forth in the succeeding sections. Where the drawings and specifications describe of portion of the work only general terms and not in complete details, it shall be understood that only the best general practice is to prevail. Materials and workmanship of the best quality are to be employed and that the instructions of the Engineer are to be fully complied with and shall be binding on the contractor. The contractor shall be fully responsible to ensure that the finished works are free from any defects, weakness, cracks etc.

1.2 CODES OF PRACTICE AND SPECIFICATIONS :

1.2.1 The abbreviations mentioned elsewhere for standard specifications and code of practices shall be considered to have the following meaning.

IS : Indian Standard of the Indian Standards Institution.
IRS : Indian Railway Standard Specifications and Code of Practices.
GCC : N.F.Railway General & Standard Special Conditions of Contract 1998 & **Indian Railway Unified Standard Specification Volume-I & II 2010 edition.**

IRC : Indian Roads Congress.
RDSO : Research, Designs and Standards Organisations (Ministry of Railways).

1.2.2 Wherever a reference is made to any of the standard specifications and code of practice it shall be taken as a reference to the latest versions/revision of the same and shall include all the ERRATA/corrections made in the same from time to time.

1.3 MEASUREMENTS

1.3.1 All measurements shall be made in the metric system. Different items of works shall be measured in accordance with the procedures set forth in the relevant sections read in conjunction with G.C.C. and special conditions of the contract.

1.3.2 All measurements and computations, unless otherwise indicated shall be carried nearest to the following limits.

i)	Length and breadth	10 mm
ii)	Height, depth or thickness of earthwork, C.C. work	5 mm
iii)	Area	0.01 Sqm.
iv)	Cubic contents	0.01 Cum.

1.4 Site clearance wherever involved shall be undertaken and the same shall be considered incidental to the earthwork items and rates for the same shall be deemed to be inclusive of all clearing operations.

1.5 Specifications not specified in the tender documents for this work, shall be in accordance with Indian Railway Unified Standard Specification Volume-I & II 2010 edition corrected up-to-date and the contractor shall be bound by them for the performance of the contract.

2.0 EARTHWORK

2.1 The changes mentioned in the tender documents are field changes are meant guidance only. For the purpose of payment, actual lengths will be measured on ground.

2.2 It shall be the responsibility of contractor to ensure that no work on the embankment or cutting is commenced until the existing ground levels at different cross sections have been recorded and such records of levels have been jointly signed

and dated by the contractor and the Engineer or his authorized representative. Cross-sectional profiles plotted on the basis of the recorded ground levels shall also be jointly signed by the contractor(s) and the Engineer. The points at which the cross sectional ground levels are to be recorded and the extent of leveling work to be done shall be decided by the Engineer. The contractor may bring to the notice of the Engineer such additional cross-sections that in his opinion should be taken for proper assessment of quantities. Such representation, however, should be made before the commencement of any earthwork. The Engineer's decision thereon shall, however, be final and binding on the contractor.

2.2.1 Contractor shall sign every page of the level book and cross section sheets where original ground and final level of completed work are recorded in token of his acceptance of these levels and cross sections for the purpose of computation of quantities of payments. No dispute whatsoever shall be entertained on this account.

2.3 Contractor shall clear all shrubs and jungles on the existing ground up to a distance of 3m from the proposed toe of the embankments. All tree stumps will have to be uprooted from the area to be covered by the formations embankment will not be paid for separately and the rate of earthwork includes such uprooting of tree stumps.

2.3.1 No extra payment will be admissible for filling up the hollows left after uprooting of tree stumps in the area covered by the embankment. Initial ground levels as represented by the cross sections taken before commencement of work will not be deemed to be vitiated, and will hold good for the assessment of the earthwork quantities, even though there may be some loss of earth in marshy/bed area due to shrinkage.

2.4 Benching has to be done on the existing banks where embankment is to be formed. No extra payment for benching in either case will be admissible.

2.5 The type of soil to be used in the embankment which will be brought from out-side the Railway land will be got approved from the Engineer in advance. Organic clay, silts, peat and shrinkable soils of low bearing capacity shall not be used for making the embankment.

2.6 Contractor should set out the work according to the plan and as directed by the Engineer or his representative. Reference pegs are to be made permanent and kept clear of all obstructions. He should obtain the approval in writing from the Engineer, for the correctness of the setting out and the reference marks, before commencing the actual execution of the works.

2.6.1 All over 12.5 m along the proposed embankment, profiles shall be erected to enable smooth execution of the earthwork in layers. No extra payment will be admissible for this.

2.7 While carrying out the filling work the contractor will take all necessary precautions to see that no infringement is caused, with signaling and other installations and structures for the smooth movement of traffic along the Railway track in and outside station limits. In course of doing work if infringements are likely to arise he shall intimate the Engineer in advance of his/their programme in writing so that necessary arrangements can be provided for carrying out such items.

2. 8 The side slopes will be as designs and drawings approved by the Engineer.

2. 8.1 If any blasting operations are necessary, they are to be carried out in accordance with the provisions under Standard Special Conditions for blasting and explosive as contained in General Conditions of Contracts, and **Indian Railway Unified Standard Specification Volume-I & II 2010 edition** with up-to date corrections.

2.9 No extra payment towards cost of bailing or pumping out water from borrow pits or cutting or foundations excavation will be made. In case the embankment is to be made for such work, it should be clearly understood that the rates quoted are

inclusive of all charges for such items incidental to earth work.

2.9.1 SPECIFICATIONS FOR FORMING EMBANKMENT WITH MECHANICAL COMPACTION.

2.9.2 After site clearance all pockets and depressions left in the soil, if any, shall be made and compacted.

2.9.3 Earthwork shall be done in layers not exceeding 300 mm in thickness in the loose state, and compacted preferably at or near the optimum Moisture Content (OMC) with suitable rollers to obtain the density specified in para 2.11.3(a) & 2.11.3(b). The number of passes of the rollers and the optimum thickness of such layer will be fixed after carrying out field trails with the roller proposed to be used, from time to time, and from location to location, the main criteria being to obtain the maximum density achievable uniformly.

2.11.3 (a) Coarse grained soils shall be compacted to get a maximum density Index (relative density) of 70% as obtained in accordance with IS: 2720 (Pt.XIV-1983).

2.11.3 (b) All other types of soils when compacted shall attain at least 98% of the max. dry density as determined using heavy compaction in accordance with IS: 2720 (Pt.VIII) 1983 followed by field trials as per IS : 10379-1982 which shall form the basis for actual densities with the approval of the Engineer.

2.11.4 Where the moisture content of the borrow soil in any layer is above OMC, it shall be left for drying for a suitable period to bring down the moisture content very near to OMC before rolling is commenced. If the soil is dry, water shall be sprinkled either in the borrow pit or over spread layer, as per convenience, in order to attain a moisture content near to OMC, before rolling is commenced. Where the natural moisture content of the borrowed soil is high, compaction at higher moisture contents up to plastic limit can be allowed with the permission of Engineer. However, its effect on the design must be analyzed and, if necessary, bank profile should be revised.

2.11.5 Each layer shall be compacted to the desired density over the entire width commencing from the two sides, before another layer is started.

2.11.6 While compacting, it shall be ensured that there is a maximum overlap of 15 cm before each run of the roller.

2.11.7 Care shall be taken during the compaction operation to slope the surface of the bank to facilitate the siding and to minimize the absorption of rainwater, particular attention being given to prevention of pounding.

2.11. 8 The density of each layer of compacted soil shall be ascertained by testing an adequate number of soil samples as decided by the Engineer.

2.11.9 The quality of works shall be determined by considering the mean density of the samples in each layer. The mean density shall be equal to or exceed the minimum specified density. Shall the density be less than the minimum specified by more than 2% further rolling shall be done at the appropriate location.

2.11.10 The contractor shall be allowed to pay a further layer of soil only after compaction of preceding layer has been satisfactory.

2.11.11 The top of the formation shall be finished to a slope of 1 in 30 away from the centre.

2.11.12 In bank filling above or against structures such as bridges, the materials shall be deposited in layers not more than 200 mm in thickness sloping away from the structure with each layer carefully tamped. Only the best available materials approved by the Engineer shall be used for this purpose.

2.11.13 Beyond the theoretical profile of bank an extra width of 50 cm shall be rolled either side which after finishing the bank up-to final height shall be dressed by removing the loose earth on account of rollers not able to compact the soil at the edge of the formation width.

2.11.14 The additional earth, after finishing the bank up-to final height shall be removed

and spread at the toe of the bank with proper slope for drainage. No extra payment will be made for providing and subsequent removal of this extra earth and contractor is to quote his rates accordingly.

2.12 No hand roller or hand ramming is permitted. However, where it is physically not possible to use the mechanical roller, the compaction maybe done by using hand roller or hand hammer/tamper with prior written permission of the Engineer, in which case thickness of layer to be restricted to 150 mm in loose state, so as to achieve the prescribed degree to compaction.

2.13 Necessary arrangement for the will testing at site will have to be organized by the contractor in accordance with these specifications as directed by the Engineer and no extra payment will be made to him on this account. The contractor shall also establish a self-sufficient laboratory for soil testing and quality control testing.

2.14 **SETTING UP SOIL TESTING LABORATORY AT SITE**

In each contract section field soil testing laboratory should be set up (Contractor should purchase equipment's for soil testing) to carry out soil testing.

2.15 **Under mentioned soil tests should be carried out**:-

i) MDD & OMC of soil.
ii) Liquid limit and plastic limit test (for classification of soil),
iii) Sieve analysis to classify soil as coarse grained or fine grained soil,
iv) Field density of compact soil in each layer at an interval of 50 m this should be minimum 98% of MDD as determined using heavy compaction in accordance with is IS: 2720 (Pt.VIII) 1983.
v) In each of coarse grained soil density index (relative density) of compacted soiling accordance with IS: 2720 (Pt.XIV) – 1983.

2.16 **List of equipment's required for soil testing**

i) Equipment for liquid limit and plastic limit test,
ii) Modified proctor test mould,
iii) Tube reamer weight 4.90 kg. Drop height 450 mm.
iv) Infra red lamp and torsion balance meter,
v) IS sieve Nos. IS 100, 63, 20, 10 and 4.75 for coarse grain sieve analysis and 2mm, 1.0 mm, 600 micron, 800 micron, 425 micron, 212 micron, 150 micron & 76 micron IS sieves for fine grain sieve analysis.
vi) Chemical balance with weight box.
vii) Physical balance with weight box.
viii) Knife,
ix) Tray,
x) Crucibles,
xi) Weight,
xii) Measuring cylinder,

2.17 **List of Equipment for Field Compaction Test**.

i) Core cutter with Dolly-Volume 10 (x) cum,
ii) Reamer,
iii) Moisture meter (Complete set)
iv) Physical balance with weight,
v) Knife,
vi) Tray.

2.18 Soil should be used on embankment only after passing by BBJ after conducting tests. Soil testing should be done from borrow pits and graph should be plotted. Test results should be signed by BBJ.

2.19 Under mentioned registers should be maintained at site and contractor's signature obtained.

i) MDD & OMC of soil
ii) Sieve analysis of soil
iii) Plastic limit and liquid limit of soil,
iv) Record of passing soil by BBJ
v) Field compaction result layer-wise at 50 m interval.
vi) Earthwork calculation registers
vii) Site order book.
viii) Log book of daily work done.
ix) Any other register required for work.

All above register should be submitted to BBJ alongwith each CC bill.

2.20 **PEGGING OUT OF ALIGNMENT**

2.21 The alignment should be marked on the ground from apex to apex of adjoining curves, so that there is no possibility of having lateral shift in alignment produced from two ends. On straight pegs should be fixed at 50 m interval and on curve it should be fixed at 25 m interval and at all TPs.

2.22 Top of sub-bank should normally be 30 cm above HFL but depending to the site conditions the height of sub-bank should be decided by BBJ in charge of the work. The top level of sub-bank should be decided before starting the work so that toe line can be marked correctly.

2.23 Earthwork should not be started in bank and sub-bank till dag belling at toe line is done and it is checked by BBJ. Dag belling of toe line should be done at a distance of 1 metre from actual toe of bank/sub-bank. Height of sub-bank should be decided before dug belling is done so that toe line (including sub-bank) can be marked correctly. Dag belling of toe should be done considering 50 cm. Extra width for main bank (which is to be dressed later on), in case of sub-bank extra width should be considered for main bank as well as for sub-bank i.e. total extra weight of 100 cm.

2.24 **MEASUREMENT AND PAYMENT**.

2.24.1 It should be clearly noted that the payment for earth filling shall be made on the basis of net quantity after deduction of shrinkage from the Gross quantity.

2.24.2 The percentage of deductions due to shrinkage shall be made as under unless otherwise stated in the description of the works :

(i) for earth filling with mechanical compaction. **5% (Five percent)**
(ii) for earth filling without mechanical compaction. **10% (Ten percent)**

2.24.2.1 The gross quantity will be arrived from the cross sectional areas after plotting the final formation levels of finished formation over the original ground levels. The total height of filling (including the shrinkage) to be done shall be decided by the Engineer. Extra quantity of earth filling beyond the required width and height (including the shrinkage) and beyond the toes will not be paid. The toes of the bank shall be as per final slope for a required profile on the basis of formation levels shown in the longitudinal section. The contractor should quote his rate accordingly.

2.24.2.2 In case earthwork is done under water in isolated locations rates quoted by the tenderer must take into account all possibilities of base settlement in marshy area etc. after making necessary investigation and payment shall be made only on final cross sections. No additional payment or any claim will be accepted.

2.24.2.3 If bandelling etc. is required for earthwork under water to be contained, the rate for earthwork would cater for this.

2.25 The “Turfing of bank” will not be commenced before slopes are dressed to the specific section and without the written permission of the Engineer. It will consist of sods not less than 7.5 cm in thickness and 23 cm square, well beaten into the slope of the bank, and laid in manner so that their edges are in close contact and form a level and compact surface. The contractor shall be responsible to ensure

that the turf grows properly. In the event of its not doing so, he will replace such parts, as have not grown at his won expenses.

2.26 When the earth for making of formation is borrowed from adjacent private lands contractor must ensure that minimum distance of borrow pit in private land from the toe of new bank is at least equal to the height of bank plus 3.0 metres.

2.27 Under no circumstances incomplete work will be taken over by the department. The contractor shall notify sufficiently in advance his intention of handling over a particular stretch of completed/finished work so as to enable recording final levels.

3 **EXCAVATION FOR STRUCTURES**.

3.1 Pits trenches for foundations of bridges, culvert wells, apron and other structures shall be taken out to the levels and dimensions shown on the approved drawings or to such other levels and dimensions as the Engineer may direct. The bottom of all excavations shall be carefully leveled and stopped on benches as directed by the Engineer. Any pocket of soft or loose materials and fissures in the bottom pits and trenches shall be removed and the cavities so formed filled or grouted with concrete as directed by Engineer. When any excavation has been done and trimmed to the required levels and dimensions, the Engineer shall be informed accordingly so that he may inspect the complete pit or trench and no excavation shall be filled in and covered with concrete until it has been inspected and the contractor has been authorised to proceed with work. All surplus excavation not required for refilling shall be deposited in embankments, or otherwise disposed off as directed. The work shall include all necessary sheeting, shoring, bracing, drawing and pumping out water, removal of all legs, stumps, grabs and other deleterious matters, obstructions, necessary for placing the foundations.

3.2 When required by the Engineer, materials in the last 500 mm of depth of the excavations shall not be removed until immediately before the concrete is to be placed.

3.3 All excavation for structures shall generally be as small as practicable, consistent with the proper construction of work. Any excavation taken out to a greater depth than that required shall be back filled with concrete of the foundation grade at the cost of the contractor.

3.4 Where water is met with during excavation due to stream flow, seepage, sorings, rain or other reasons, the contractor shall take adequate measures such as bailing, pumping, constructing diversion channel, drainage channel, bonds and other necessary works to keep the foundation trenches dry and other necessary and to protect the green concrete against damage by eruption or sudden rising of water level. Approval of the Engineer to any method adopted for the adequacy of dewatering and protection arrangements and for the sound safety of the work shall be required.

3.5 Refilling of foundation pits and trenches shall be carried out only after the foundation and structure works within the excavation have been inspected and approved by the Engineer. Unless otherwise directed by the Engineer all fillings shall consist of approved materials. All space between foundation concrete and the sides of excavation shall be refilled to the original surface, using approved plant, in single layers not exceeding 250 mm loose thickness which shall be watered and completed to a dry density not less than that of the adjoining soil strata. Timber sheeting and other excavation support shall be carefully removed as the filling proceeds but the removal of such supports will not relieve the contractor of his responsibility for the stability of the works.

3.6 **MEASUREMENTS OF PAYMENT**

3.6.1 Excavation for structures shall be measured in cubic metres, limited to the

dimensions shown in the approved drawing or as directed by the Engineer keeping in view practical necessity for proper execution of the work. Foundation sealing, de-watering including pumping shall be deemed to be incidental to the work and no extra payment shall be payable for this work.

3.6.2 For any special treatment of foundation such as grouting of cavities and fissures, extra payment will be made at mutually agreed rates.

3.7 **RATES**

The contract unit rate for the item of earthwork in excavation for structures shall be paid in full for carrying out the required work including full compaction to –

i) Setting out including all ancillary works like pegging and supply of pegs etc.

ii) Construction of necessary sheeting, shoring and bracing and then subsequent removal.

iii) Removal of all logs, stumps, grubs and other deleterious matters and obstructions for placing foundations including trimming of bottom of excavations.

iv) Foundation sealing, de-watering including pumping.

v) Back filling upto the top of foundation clearing up the site and disposal of all surplus materials within leads upto 200 m inclusive of all leads, descents etc.

vi) All labour, materials, tools, constructions plants, safe guards and incidental necessary to complete the work as per specification.

4.0 **MATERIALS FOR STRUCTURES**

All materials to be used in the work shall be in conformity with the requirement laid down hereunder. All other materials not specified herein fully are required to be used in the work conforming to the appropriate code described under clause 1.2.1. These materials shall only be used on being approved by the Engineer or his representative and in case being rejected shall be removed from site and replaced at his own expenses by the Contractor.

4.1 **BINDING WIRE**

Binding wires used for binding the reinforcement shall be of approved quality soft annealed iron wire not less than 1 mm (18 SWG) size, conforming to IS: 280.

4.2 **REINFORCEMENT STEEL**

4.2.1 **All structural steel for bridges shall conform to IS: 2062 – 1992. Grade `B' type.**

4.2.2 **Reinforcement to be used in RCC/ PSC bridge works shall conform to IS: 1786 , 1979**

4.2.3 **High Tensile prestressing steel (strands) used for PSC girders shall conform to IS: 6006-1983 class-I type.**

4.3 **TIMBER**

The timbers used for structural purpose whether permanent/semi permanent or temporary work shall conform to **IS: 883.**

4.4 **WATER FOR CONCRETE AND MORTAR**

Water shall be clean and free from injurious amount of deleterious materials. Normally portable water from an approved source may be considered satisfactory for washing aggregates, mixing and curing concrete, and shall comply with the provision of **IS : 456.**

4.5 **AGGREGATE FOR CONCRETE**

4.5.1 General – The aggregates (coarse and fine) for concrete shall comply in all respects with **IS: 383** and shall be obtained from a source approved by the Engineer.

4.5.2 Aggregate which are not clean are to be washed to the satisfaction of the Engineer or his representative in water of quality as described in Clause 4.4. If the Engineer so directs, the contractors shall provide and operate a washing plant to ensure adequate supply of clean aggregates within the approved grading limit. All such washed aggregates shall be stored and drained for at least 24 hours before being used for concreting.

4.5.3 The coarse aggregate, unless otherwise specified or authorised by the Engineer shall not be delivered to the site. All aggregates shall be protected from dust contamination by methods approved by and to the satisfaction of the Engineer or his representative.

4.6 **SAMPLES AND TESTS**

4.6.1 **GENERAL** : The samples of all the materials proposed to be used by the contractor in the work shall be got tested by the contractor in an approved laboratory and necessary test certificates including manufacturers certificates of tests, proof sheets, mill sheets etc. showing that the materials have been tested in accordance with and conform to the requirements of the appropriate IS Codes and other relevant Standard Specifications or these specifications, shall be supplied in original free of charges on request to the Engineer or his representative.

4.6.2 Samples of the following materials shall be submitted to the Engineer or his representatives free of charge for testing and approval.

i) Coarse and fine aggregate,

ii) Any other materials as directed by Engineer.

4.6.3 Samples provided to the Engineer or his representatives for their retention are to be kept in leveled boxes suitable for storage. Materials or workmanship not corresponding in character and quality with approved samples shall be rejected.

4.6.4 Samples required for testing and approval must be supplied giving sufficient time to allow for such testing and approval, due allowance being made to the fact that if samples are rejected further samples shall be required. Delay to the works arising from the late submission of samples shall not be acceptable as a reason for delay in the completion of the work.

4.6.5 The testing of the materials may be carried out by the BBJ in any laboratory of its choice if required. If the materials are not found to comply with the various provisions laid down in the relevant IS Codes. Other relevant Standard Specifications or these specifications, the same shall be rejected irrespective of the test certificate submitted by the contractor.

4.6.6. In addition, the Engineer shall have the right to require the contractor at any time to draw samples of aggregates or any other materials from stock piles on the site or any other locations to be drawn in accordance with IS-2386 and tested in laboratory approved by the Engineer in accordance with the appropriate clause of IS : 2386 at the cost of the contractor.

4.6.7 Tests for the determination of impurities in the sand shall be made once daily until the Engineer is satisfied that the specified compression strength is being regularly obtained, such tests shall be made once weekly and at other times as directed by the Engineer.

4.6.7.1 The cement and steel brought by the contractor will also be tested from each lot as directed by the Engineer or his representative. The contractor will also furnish original purchase bills. Random samples shall also be taken to assess the weight per metre of steel. The payment shall be on the actual weight basis taking advantage of tolerance in the IS: Code.

4.6.8 **ADDITIONAL TESTS**

In addition to the tests required under clause hereof the Engineer or his representative may order tests to be carried out by an independent person appointed by him at such place or in such laboratory as he may determine in accordance with the appropriate clause of IS: 2386 or IS : 2586 and the cost of such tests shall be borne by the contractor.

4.6.9 The results of all such tests as described herein above and later or in succeeding paras shall be forwarded to the Engineer or his representative for his retention as record.

4.6.10 **INSPECTION OF MATERIALS**

4.6.10.1 Wherever the Engineer or his representative gives notice to the contractor that materials are to be inspected off the site, the contractor shall, having regard to the location of the materials and the nature of the inspection, test or examination required, give to the Engineer or his representative at least one week's notice of such materials being ready for inspection, test or examination.

4.6.10.2 Delay to works arising from the late submission of such notice will not be acceptable as reason for delay in the completion.

4.6.11 **REJECTION OF MATERIALS**

4.6.11.1 Materials shall be tested before leaving the manufacturer's premises, where appropriate. Materials may as well be tested on the site and they may be rejected if found not suitable or not in accordance with the specifications notwithstanding the results of tests at manufacturer's works or elsewhere or test certificates.

4.6.11.2 The Engineer or his representative shall have the right to order at any time, that any aggregate or other construction materials which do not meet with his approval shall not be used in the works and such rejected materials shall be removed from the site by the contractor at his own expenses, notwithstanding any prior approval which might have been given earlier.

4.6.11.3 In case of default on the part of the contractor in removing rejected materials within the time specified in notice, the Engineer shall be at liberty to have them removed by other means at the cost of the contractor.

4.6.12 **STORAGE OF MATERIALS**

4.6.12.1 All materials to be used in permanent works shall be stored on rocks, supports, stock piles in bins under cover etc. as appropriate, to prevent deterioration or damage from any cause whatsoever to the satisfaction of the Engineer or his representative.

4.6.12.2 The contractor shall at all times maintain on the site such quantities of each type of aggregates as are considered by the Engineer or his representative to the sufficient to ensure continuity of works.

4.6.12.3 Each type and grading of aggregate shall be stored in separate tacks on a hard floor having sufficient slope to ensure adequate drainage of surplus water. Wet and washed aggregate shall be kept in storage for at least 24 hours to ensure adequate drainage before being used for concreting.

4.7 **CEMENT**

4.7.1 In general, for all mass and reinforced concrete works, ordinary port-land cement conforming to **IS: 269** shall be used. However, BBJ reserves the right to ask the contractor at any time for using other varieties of Standard cement complying with the relevant IS Codes or any other Standard Specifications and the contractor shall use the same. Two or more types of cement in one member of the structure shall not be allowed.

5.0 **CEMENT CONCRETE WORKS**

5.1 **GRADE OF CONCRETE**

5.1.1 Nominal mix concrete is to be used where it is shown in the drawings or as directed by the Engineer.

5.2 **STRENGTH REQUIREMENT OF CONCRETE**

5.2.1 In designation of concrete mix, letter 'M' refers to mix and the number of the specified 28 days work cube compressive strength of that mix on 150 mm cubes expressed in N/mm sq.

5.2.2 The compressive strength requirements for various grades of concrete shall be as given in table below :-

S/N	Grade of concrete	Compressive work test strength in N/mm sq. Of 150mm cubes after mixing conducted in accordance with IS : 516

		Min. at 7	Min. at 28 days
i)	M10 (Nominal mix.1:3:6)	7	10
ii)	M15 (Nominal mix 1:2:4)	10	15
iii)	M20 (Nominal mix 1:1 ½ :3)	13	20
iv)	M25 (Controlled mix 1:1:2)	17	25
v)	M30 (Controlled mix)	20	30
vi)	M40 (Controlled mix)	27	40
vii)	M45 (Controlled mix)	30	45

5.2.1 Where the strength of a concrete mix as indicated by tests, lies in between the strength of any two grades specified in table above, such concrete shall be classified for all purpose as concrete belonging to the lower of the two grades between which its strength lies.

5.3 **TESTS AND STANDARDS OF ACCEPTANCE**

5.3.1 **PRELIMINARY TESTS FOR CONTROLLED CONCRETE**

5.3.1.1 Design of the mix shall be carried out by the contractors in his own laboratory in presence of the Engineer/representative.

5.3.1.2 Trial mixes shall be made using samples of the aggregates cement and water, typical of those to be used in the works,

5.3.1.3 Should the strength shown by the preliminary tests prove to be below the figures specified in para 5.2.2 the contractor shall make such changes in proportions as are required to bring the concrete upto the required strength.

5.3.1.4 Wherever mix has been approved, no variations shall be made in the proportions, the original course of the cement and aggregates or in the type, size and grading zone including water cement ratio without the consent of the Engineer who may require further tests to be made.

5.3.1.5 For controlled concrete, the concrete mix shall be so designed as to attain in preliminary tests strength of at least 35 percent higher than that required on work given in table under Clause 5.2.2.

5.3.1.6 WORKS STRENGTH TESTS FOR CONCRETE

5.3.2.1 The contractor shall be held responsible for ensuring that the crushing strength of the concrete as placed is not less than the designed strength as per approved plans.

5.3.2.2 SAMPLING AND STRENGTH OF DESIGNED CONCRETE MIX

GENERAL

Samples from fresh concrete shall be taken as per IS 1199 and cubes shall be made cured and tested at 28 days in accordance with **IS 516**.

In order to get a relatively quicker idea of the quality of concrete, optional tests on beams for modulus of rupture at 72± 2h or at 7 days or compressive strength test at 7 days may be carried out in addition to 28 days compressive strength test, For this purpose the values should be arrived at based on actual testing. In all cases the 28 days compressive strength specified in Table 2 shall alone be the criterion for acceptance or rejection of the concrete

FREQUENCY OF SAMPLING

Sampling Procedure

A random sampling procedure should be adopted to ensure that each concrete batch shall have reasonable chance of being tested that is, the sampling should be spread over the entire period of concreting and cover all mixing units.

Frequency

The minimum frequency of sampling of concrete of each grade shall be in accordance with the following

Quantity of concrete in the work, cum	Number of samples
1-5	1
6-15	2
16-30	3
31-50	4
51 and above	4 plus one additional sample for each additional 50 cum or art thereof.

Note

At least one sample shall be taken from each shift. Where concrete is produced at continuous production unit such as ready mixed concrete plant, frequency of sampling may be agreed upon mutually by suppliers and purchasers.

TEST SPECIMEN

Three test specimens shall be made for each sample for testing at 28 days**.** Additional samples may be required for various purposes such as to determine the strength of concrete at 7 days or at the time of striking the form work, or to determine the duration of curing, or to check the testing error. Additional samples may also be required for testing samples cured by accelerated methods as described in IS 9103. The specimen shall be tested as described in IS 516.

TEST RESULTS OF SAMPLE

The test results of the sample shall be the average of the strength of three specimens. The individual variation should not be more than ±15 percent of the average. If more the test results of the sample are invalid.

5.3.2.3 The contractor shall provide at his own expense all necessary labour, materials including cement moulds, equipment for sampling and all other ancillaries required in preparing specimens etc. as given in clause 5.3.2.2 and arrange to carry out test on these specimens in his own field laboratory. The contractor shall test these specimens in presence of the representative of the Engineer. Duplicate results shall be maintained under the joint signature of the contractor and the Engineer's representative. One set of the result being kept with the contractor and the other with the Engineer's representative.

5.3.2.4 All work shall be carried out under the supervision of a qualified and competent Engineer of the contractor who shall supervise proportioning, placing and compacting of concrete at all stages.

5.3.2.5 The Engineer reserves the right to take samples of concrete test cubes independently at his own discretion. The contractor shall provide all facilities at his own expense in preparation of such samples and concrete test tubes such as labour materials including concrete moulds, equipment for sampling and all other ancillaries required in their preparation. Contractor shall also arrange to transport these specimen to the laboratory selected by BBJ at his own cost. Contractor shall depute his representative during testing who shall sign the test results as a token of contractor's acceptance.

5.4 STANDARD OF ACCEPTANCE

The average strength of the group of cubes cast for each day shall not be less than the specified work cubes strength. 20 percent of the cubes cast for each day may have values less than the specified strength, provided the lowest is not less than 85 percent of the specified.

5.5 PROPORTIONING CONCRETE

5.5.1 Ordinary concrete mix shall generally be specified by volume. Volume of ingredients shall be worked out taking 50 kg. Of cement as 0.035 cum in volume. While measuring aggregates by volume, shaking, ramming or hammering shall not be done. Allowance for bulking of damp sand be made as IS : 2386 (Part-III).

5.5.2 Proportion of ingredients required for ordinary concrete containing one 50 kg bag of cement for different grades of concrete is given below :-

Grade of concrete	Mix by volume
M 10	1:3:6
M 15	1:2:4
M 20	1:1.5:3
M 25	1:1:2

5.6 WORKABILITY OF CONCRETE

Optimum quantity of water shall be mixed just to produce a design concrete of required workability. Workability shall be such that the concrete surrounds and properly grips all reinforcement. The degree of consistency, which shall depend upon nature of work and method of vibration of concrete, shall be determined by regular slump tests to be carried out by the contractor at his cost. Usually for mass concrete in R.C.C. works where vibrations are used the slumps shall be within 10 mm to 25 mm. The frequency of such tests and the natures of slumps shall be maintained within the limits specified by the Engineer. The Engineer also reserves the right to carry out slump tests independently at his own discretion.

5.7 CONTROLLED CONCRETE

5.7.1 The proportions of the ingredients shall be taken by weight from the stock piles collected at site and already approved on the basis of preliminary tests. Care shall be taken that the supply of properly graded aggregate of uniform quality is maintained till the completion of works except where it can be shown to the satisfaction of the Engineer that the supply of properly graded aggregate of uniform quality cannot be maintained till the completion of works. Grading of aggregate shall be controlled by obtaining them in the right propositions as required. Grading of coarse and fine aggregate shall be checked as frequently as possible and as determined by the Engineer.

5.7.2 Cement shall have to be weighed from bulk stocks at site and not by bags, it shall be weighed separately from the aggregates.

5.7.3 Water shall either be measured by volume in calibrated buckets or weighed. All necessary equipment shall be maintained in a clean and serviceable condition. Their accuracy shall be periodically checked.

5.7.4 To maintain the specified water cement ratio constant and at its correct value, moisture contents in both fine and coarse aggregates shall be determined with reference to IS : 2386 (Part-III) and amount of mixing water shall then be adjusted suitably.

5. 8 MIXING CONCRETE

5.8.1 All concrete shall be mixed at site in a drum type mechanical mixer in first class working condition. Mixing shall be continued till materials are uniformly distributed and a uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate shows complete coating of cement mortar. The mixing shall in no case be less than 2 minutes after all the ingredients have been put into the mixer.

5.8.2 Mixer which has been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch. Mixing plant shall be thoroughly cleaned before and after use. A standby mixing plant equivalent to that in use, shall be provided and maintained ready for immediate use during any break down.

5.9 FORM WORK

5.9.1 The term form work includes all temporary or permanent form essential for forming the concrete, together with all temporary construction props, bracings required for the support. In general the erection and removal of form work shall be in accordance with the provision given under clause 9.2 of I.R.S. Concrete Bridge Code (April, 1982 edition).

5.9.2 CONSTRUCTION & PREPARATION OF FORM WORK FOR BRIDGES

5.9.2.1 Forms for concrete shall be made of either metal or timber suitably lined and of substantial and rigid construction true to shape, alignment and dimensions as shown on the approved drawings.

5.9.2.2 Forms shall be mortar tight and shall be made sufficiently rigid by the use of ties and bracings to prevent any displacement, deflection or movement of any kind. They shall be strong enough to withstand of the construction, all pressure, ramming and vibration, movement of persons, materials and plant during and after placing the concrete. Special measures shall be taken to ensure that the form work does not hinder the shrinkage of concrete because without this cracking could occur before the form work is removed.

5.9.2.2.1 When the forms are ready for commencing concreting, the contractor shall inform the Engineer or his representative to inspect and accept the forms as to their strength, alignment and general fitness. Being satisfied with the form work Engineer then may allow the contractor for puring concrete but such inspection and permission shall not relieve the contractor of his responsibility for safety of men, machinery, materials and for results obtained.

5.9.3 REMOVAL OF FORM WORK

5.9.3.1 The consent of Engineer or his representative shall be obtained in all cases before removing any form work but such permission shall not relieve the contractor of his responsibility in respect of any injury or damage to the concrete work arising from the removal of the forms.

5.9.3.2 Forms shall be so constructed and fitted as to be removable in sections in the desired sequence without damaging the surface of concrete or disturbing other sections.

5.9.3.3 Due consideration ;shall be given to the local conditions, character of structure, the weather, climate and temperature and other conditions that influence the setting of concrete before removal of form work.

5.9.3.4 Where internal metal ties are permitted, they shall be extracted or cut without causing any damage to concrete and remaining holes filled with mortar. No permanently embedded metal part shall have less than 25 mm clear cover to the finished concrete surface. The contractor shall make good, at his own expense, any injury or damage to the concrete work arising from removal and striking of forms and supports.

5.9.3.5 The form works shall be cleaned and made good to the satisfaction of the Engineer before reuse. The cost of all form work shall be deemed to have been included in the rate for cement concrete items of work and shall not be paid separately.

5.10 TRANSPORT, PLACING AND COMPACTION OF CONCRETE

5.10.1 The method of transporting and placing concrete shall be approved by the Engineer or his representative. All concrete shall be so transported and placed that no contamination segregation or losses of its constituent materials take place.

5.10.2 All form work and reinforcement, contained in it shall be cleaned and made free from standing water, dust, snow orice immediately before placing of concrete. No concrete shall be placed in any part of the structure until the approval of the Engineer or his representative has been obtained. Concrete shall be compacted in its final position within 30 minutes of its discharges from the mixer. Concrete when deposited shall have a temperature of not less than 4.5 degree C and not more than 38 degree C.

5.10.3 Except when otherwise agreed to by the Engineer or his representative, concrete shall be deposited in horizontal layers to a compacted thickness of not more than 450 mm when internal vibrators are used and not exceeding 300 mm in all other cases. In no case concrete shall be allowed to be dropped from a height of more than 2 metres.

5.10.4 When concrete is conveyed by chutes the plant shall be of such size and design so as to ensure practically continuous flow. Slope of the chute shall be so adjusted that the concrete flows without the use of excessive quantity of water and without segregation of its ingredients. The delivery end of chute shall be as close as possible to the point of deposit. The chute shall be thoroughly flushed with water before and after each working period and the water used for this purpose shall be discharged outside the form work.

5.10.5 All concrete shall be compacted to produce a dense homogeneous mass with the help of vibrators except in case of concrete poured under water, where vibrator cannot be used. To ensure thorough and properly compacted concrete the contractor shall carry out a necessary compacting factor tests at his own cost at such frequency and the value of compacting factor to be maintained as decided by the Engineer. The contractor shall have to carry out other tests like Penetrometer and Vee Bee Consist meter tests or any other tests as directed by the Engineer at his own cost. The Engineer, however, reserves the right to carry out such tests, independently at his own discretion. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of break-downs. Internal vibrators shall be capable of producing not less than 10,000 cycles per minute, and external or form vibrator not less than 3,000 cycles per minute. Vibration shall not be applied through reinforcement, and where vibrator of the immersion type areused, contact with reinforcement and all inserts shall be avoided as far as practicable.

5.11 CONCRETING UNDER WATER

5.11.1 The methods, equipment, materials and proportions of the mix to be used shall be got approved by the Engineer or his representative before concreting under water. Greatest care shall be taken to prevent the cement being washed out and the concrete shall be deposited by means of a tremis or using the skip boxes system. Pumping shall not be done while concrete is being placed or until 24 hours thereafter.

5.11.2 The deposition of concrete should be done continuously until it has been brought to the required height. The top surface shall always be kept as nearly level as possible to prevent formation of scum.

5.12 FINISHING

5.12.1 Immediately after the removal of forms, all exposed bars or bolts passing through RCC member and used for shuttering or any other purpose shall be cut inside the RCC member to a depth of atleast 25 mm below the surface of the concrete and resulting holes be closed by cement mortar.

5.12.2 If in the opinion of the Engineer, the pockets/honey comb in the structure are found to such an extent or character as to affect the strength of the structure materially or endanger the life of the reinforcement, he may declare such concrete defective and order for its removal and replacement at the expense of the contractor.

5.13 CURING

5.13.1 All concrete shall be protected immediately after compaction and during hardening from harmful effects of rain, funning water, sunshine, frost and driving winds, shocks, vibrations, traffic and rapid temperature changes. All exposed faces of concrete shall be kept continuously wet by applying water or covering with wet sacking, hessian etc. for a period of not less than 14 days from the date of

deposition.

5.14 CONSTRUCTION JOINTS

5.14.1 All construction joints horizontal or vertical shall be at predetermined position according to approved drawing or as directed by the Engineer. Prior to commencement of fresh concreting over any construction joint which has set but not hardened, the removal of laitance and roughening shall be done by wire brushing and washing and care shall be taken to avoid dislodgement of coarse aggregates.

5.14.2 At construction joints where the concrete has et hard, any skin or laitance shall be thoroughly hacked, swept cleaned and washed with clean fresh water. The surplus water shall be removed immediately before depositing fresh, concrete. The neat cement, grout shall be followed by 13 mm thick layer of cement mortar of same proportion as in concrete and the concreting resumed immediately thereafter. The first batch of fresh concrete shall be forced hard on to the mortar layer and the set faces, angles and corners by means of compacting tools, vibrators etc. and the damping effect on vibration in such position shall be allowed for.

5.14.3 Construction joints shall be avoided as far as possible in case of structure, specially at tensile zones. Where unavoidable, concreting shall be carried out continuously upto such joints which shall preferably be transverse to the line of main compression. However, in all cases, the position of construction joints shall be predetermined and got approved by the Engineer.

5.15 REINFORCEMENTS

5.15.1 All reinforcement shall be cleaned thoroughly by removing loose scales, oil, grease or other deleterious materials. The contractor shall obtain the approval of the Engineer or his representative to the reinforcement when fixed in position before any concrete is deposited in the forms.

5.15.2 Bars shall be bent cold or straightened in a manner to the satisfaction of the Engineer or his representative. Bars bent during transport or handling shall be straightened before using on work. They shall not be heated to facilitate bending. Welding shall be done as per IS Code of practice or IRS Concrete Bridge Code as applicable.

5.15.3 PLACING AND MAINTENANCE OF REINFORCEMENT IN POSITION

5.15.3.1 All reinforcement bars shall be cut and Standard hooks for M.S. rounds made at ends and accurately placed in position as shown on the approved drawings and shall be securely held in position before and during concreting by annealed binding wire (as specified in Clause 4.1) and by using dense concrete spacer blocks prepared and cured as directed by the Engineer or his representative, or metal chairs, metal spacers, supporting wires or other approved device at sufficiently close intervals. Bars representative, or metal chairs, metal spacers, supporting to get displaced during concreting or any other operation over the work. Metal supports shall not extend to the surface of the concrete, except where shown on the drawings, pieces of broken stone or brick and wooden blocks shall not be used.

5.15.3.2 As far as possible, bars of full length shall be used. Where bars are required or permitted to be lapped by the Engineer, or his representative, the over laps shall be staggered for different bars and located at points, along the span where neither shear nor bending moment is maximum. The concrete cover measured over the reinforcing bars shall be in accordance with the approved drawings.

5.16 MEASUREMENT FOR PAYMENT

5.16.1 The work of cement concrete shall be measured in cubic metres. The volume occupied by reinforcement shall not be deducted in R.C.C. works. The measurement shall also be for the purpose of computing cement consumption.

Reinforcement shall be measured in length (running metre) separately for different diameters as actually used in work including overlaps, hooks ends and inclusive of chairs, supports as actually placed and incorporated in the work. Form the length so measured the weight the reinforcements shall be calculated in quintals on the same basis on which steel is supplied to the contractor by the BBJ.

The weight of binding wire shall not be taken into account in computing the reinforcement quantity. This measurement shall be only for the purpose of working out reinforcement consumed in the work.

5.17 SETTING OF FIELD LABORATORY BY CONTRACTOR

5.17.1 The contractor shall set up a field laboratory of his own at work site as a part of concrete work and shall be kept open for use and inspection by the BBJ at any time.

5.17.2 All the pressure gauge and other machines, equipment and measuring instruments shall be got checked and calibrated regularly as directed by the Engineer, by an independent agency and the adjustment certificate furnished to the Engineer. The contractor shall render all reasonable assistance and help in making such checks and tests etc. The cost of all checks and calibrations shall be borne by the contractor. The cost of all tests for materials and cubes shall also be borne by the contractor. Alternatively, the contractor shall arrange to get the cubes and their materials, as required tested at his own cost, in approved laboratory to the satisfaction of the Engineer.

6.0 ABUTMENTS, PIERS AND R.C.C. BOXES

6.1 The abutments, piers, pier caps are to be constructed of concrete grades as mentioned in the approved drawing. The individual members are to be monolithic with the parent member

6.2 **WEEP HOLES**

Sufficient Nos. of weep holes including provision of Asbestos pipes (in the weep hole portion only) in abutments, wing and return walls is to be provided as shown in the approved drawing or as directed by the Engineer with contractor's own labour, materials etc. No extra payments will be admissible for provision of the weep holes in the bridges and no deduction from quantity of concrete shall be made for weep holes.

7.0 **SLOPE PITCHING AND APRON**

For pitching the slopes of banks, bridge floors, apron on bridge approaches, hand packed rough stones weighing between 30 kg and 50 kg with not less than 150 mm size shall be used in such a manner as to provide maximum interlocking amongst the individual stones. The size to be adopted should suit the total thickness required as per drawings. The work should be carried out as to provide uniform slopes and curvature around abutments. The rates also include provision of steps shown in plan and pitching work under water wherever required.

8.0 **PACKING BEHIND ABUTMENT**

Boulders to be used behind abutment, wing and return walls, shall be collected from approved quality of stone to angular shape and shall not be less than 150 mm size in any direction and shall have its maximum dimension not less than 250 mm and shall weigh not less than 12 kg and not more than 55 kgs. The hand packing should be done in sections as shown in the drawing or as directed by the Engineer.

9.0 R.C.C. HUME PIPE (Heavy Duty)

9.1 Relevant item of the schedule of items and approximate quantities include supply at the contractor's cost of reinforced concrete pipes as per RDSO's Drawing No.RDSO/B-16-09-RI and shall be in accordance with specifications mentioned below. Cost should include the cost of reinforcement steel and cement.

9.1.1 The pipes will be of flush joint, design as shown in above stated plan.

9.2 The rates shall include all charges to be incurred in supplying, loading at the manufacturer's premises and transporting up to the site of work, all cost of materials and labour incidental to loading, unloading, handling etc. together with the cost of transport, handling at the site of work placement in position aligning and joining the pipes with cement mortar of (1:2) proportion, curing etc. complete. Cement as per requirement for joining pipes also will be supplied by the contractor unless otherwise specified.

9.3 The contractor will have to advise BBJ of the source of the supply of the R.C.C. pipes including the name of the manufacturer and location of the manufacturer's premises.

9.4 **METHOD OF MANUFACTURE**

The methods of manufacture of R.C.C. pipes will be such so as to conform to the dimensions, specifications etc. as stated in the RDSO's plan. In addition, the specification as per **IS: 458 – 1971** shall be the guiding factor for manufacture of the pipes. Where there is any discrepancy between the two, the specification mentioned in drawing will prevail.

9.5 During manufacture, tests on concrete shall be carried out as detailed in **IS : 456 – 2000** and the contractor will furnish results of compressive tests of concrete cylinders or cubes made from the concrete used for the pipes duly certified by the manufacturer, concrete shall be mixed in a mechanical mixer.

9.6 The following information shall be clearly marked in each pipe by the manufacturer :-

i) Drawing No.
ii) Date of manufacture and
iii) Name of the manufacturer or his registered trade mark, if any or both.

9.7 Sampling, inspection and testing of pipes shall be at the cost of contractor in accordance with the provision in **IS : 458 – 1971**and **IS : 3597 – 1985**at the manufacturer's premises before these are despatched to the site. Further inspection of all pipes will be carried out at the site of work before being placed in position.

9. 8 If the BBJ desires, edge bearing test is to be conducted by the manufacturer on samples selected as per IS : 458 -–1974 and is to be carried out as per IS : 3597 – 1985 and the test results supplied. Cost of such tests is to be borne by the contractor.

9.9 The reinforcement provided in the hume pipe as per drawing, can be checked and approved by the BBJ's representative before concreting is done. The contractor shall obtain from the manufacturer and submit to the BBJ a certificate indicating the details relating to quantity, quality and dispersion of steel in the pipes.

9.10 Subsequent to the initial inspection of the pipes at the manufacturer's premises, damages caused to the pipes in the course of handling and transporting of pipes to the site of work will make the pipes liable to be rejected. The decision of the Engineer in this regard shall be final and binding.

10.0 Laying of the pipes will conform to the provision of IS : 783 – 1985 or as shown in the approved general arrangement drawing.

CHAPTER-VII
SPECIAL SPECIFICATION FOR BUILDING WORK

SPECIAL SPECIFICATIONS FOR BUILDING WORK

1.0 Site Clearance :

1.1 Site clearance wherever involved shall be undertaken and the same shall be considered incidental to the earth work items and the contract unit rates for the same shall be deemed to be inclusive of clearing and grabbing operation.

2.0 Excavation for Structures :

2.1 Pits and trenches for foundations shall be taken out to the levels and dimensions shown of the approved drawings or to such other levels and dimensions as the Engineer may direct. The bottoms of all excavations shall be carefully leveled and stepped or benched as directed by the Engineer. When any excavation has been taken out and trimmed to the required levels and dimensions, the Engineer shall be informed accordingly so that he may inspect the complete it or trench and no excavation shall be filled in until it has been so inspected and until the contractor has been authorized to proceed with work. All surplus excavated materials from such excavation not required for refilling shall be deposited in embankments of the guide bunds if found suitable by the Engineer, or otherwise disposed of as directed. The work shall include all necessary sheeting, shoring, bracing, drawing and pumping the removal of all logs, stumps, grubs, and other deleterious matter and also removal of all obstructions, necessary for placing the foundations.

2.2 All excavations for structures shall generally be as small as practicable consistent with the proper construction of the works. Any excavation taken out to a greater depth than that required shall be back filled.

2.3 Where water is met with the excavation due to stream flow, seepage, springs, rain or other reasons, the contractor shall take adequate measures such as bailing, pumping, construction diversion channel, drawings, channels, bunds and other necessary works to keep the foundation trenches dry when not required and to protect the green concrete against damage by erosion or sudden rising of water level. Approval of the Engineer to any method adopted in this regard shall however, not relieve the contractor of the responsibility for the adequacy of dewatering and protection arrangements and for the quality and safety of the work.

3.0 Measurements for payment :

3.1 Excavation for structures shall be measured in cubic metres, limited to the dimensions shown on the Drawings as directed by the Engineer keeping in view practical necessity for proper execution of the work.

3.2 Foundations sealing, dewatering including pumping shall be deemed to be incidental to the work and no extra payment shall be payable for this work.

4.0 Rates :

4.1 The contract unit rate for the items of earth work in excavation for structures shall be paid in full for carrying out the required work including full compensation for :

(i) Setting out including all ancillary works like pegging and supply of pegs etc.

(ii) Construction of necessary sheeting, shoring and breaching and then subsequent removal.

(iii) Removal of all legs, stumps, grubs and other deleterious matter and obstructions for placing the foundation including trimming of bottom of excavation.

(iv) Foundation seating dewatering including pumping.

(v) Disposal of surplus earth if found suitable to form the embankment of either of theguide bunds with all leads, lifts, descents, crossing rivers, BBJ track etc.

5.0 Materials for Structures :

5.1 All materials to be used in the work shall be in conformity with the requirement laid down as below :

If any special materials, not covered here is required to be used, it shall conform to relevant IS specifications if there are any or to the requirements specified by the Engineer.

6.0 Other materials :

6.1 All materials not herein specified fully and which may be allowed to be used in the works at the discretion of Engineer shall be procured in accordance with relevant IS or in absence of an IS Code, the appropriate codes as described under Clause 2.2.1. The Engineer or his representative shall have the right to inspect and determine whether all or any of the materials, brought to site for use in the works are suitable for the purpose. Any materials rejected by Engineer or his representative shall be removed from the site and replaced with suitable materials at his own expenses by the contractor.

7.0 Concrete Work :

The following materials should be used for cast in site as well as precast cement concrete works:

(a) R.C.C. works : Coarse aggregates of broken hard stone of approved quality of size 6 mm to 20 mm for slabs, beams, bands, columns etc. as approved by the Engineer.

(b) For plain concrete of mix of 1:2:4 broken hard stone chips of approved quality of size 6 mm to 20 mm.

(c) For all plain concrete work of mix 1:3:6/1:4:8 screened hard shingles of approved quality of size from 13 mm to 38 mm as directed by the Engineer.

(d) The concrete strength of different nominal mixes in the relevant items should conform to the strength specified in the IRS Codes, wherever this is not available in the IRS Codes volumes from I.S.I & T.R.O. Codes shall be applicable.

8.0(a) **Specifications for 25 mm thick G.C. Slab (1:2:4) over R.C.C. roof slab**.

(i) Before mixing of concrete, sand and stone to be passed by the concreting BBJ.

(ii) Fine aggregate, sand should conform to **Indian Railway Unified Standard Specification Volume-I & II 2010 edition.**

(iii) Coarse aggregates

(b) Manufactured coarse aggregates of requisite size as above shall consist of uncoated hard, strength dense and durable pieces and shall be free from injurious amount and short of flaky particulars and veritable matters and other deleterious substances.

(c) 0.2% by volume may pass through an approved sieve of 5 m size and 100% should pass through an approved sieve of 8 mm size.

(i) Water proofing compound: 5% (i.e. @ 2.5 Kg per bag of cement). This should be of ACC brand (such as ACC proof, Imperms etc.) and has got to be approved by the Engineer before use.

(ii) Laying of Concrete :

Laying of concrete to be done according to the procedure laid down in **Indian Railway Unified Standard Specification Volume-I&II 2010 edition** while laying a smooth slope 1 in 40 to be provided.

(iii) Curing time – 28 (Twenty eight) days.

(d) The concrete strength of different nominal mixes in the relevant items should conform to the strength specified. In the IRS Codes wherever this is not available in the IRS Code volumes from I.S.I. & I.R.C. Codes shall be applicable.

9.0 Road Works :

The road work should be done conforming to the specification under Chapter-XXIII of **Indian Railway Unified Standard Specification Volume-I & II 2010 edition.**

10.0 Drains:

Open surface pucca drains are to be constructed with 2nd class bricks as per Chief Engineer/ N.F. Railway's type plan No.CE/T(M)/1/64 in conformity with the specifications laid down in Chapter-XIV of **Indian Railway Unified Standard Specification Volume-I & II 2010 edition.**

11.0 Plastering/Painting the Walls :

11.1 Jambs for doors, windows, ventilators, cupboard etc. adjoining the walls should be continued with plaster/ rule pointing as the case may be. For ceilings in rooms the under side of the R.C.C. Roof slabs should be brought to an even finish after removal of the form work by applying a thin coat of cement mortar of one part of cement and two parts of sand so as to fill the hollow and remove the unevenness in the surface.
The plastering work should conform to **Indian Railway Unified Standard Specification Volume-I & II 2010 edition.**

12.0 Washing Colours Washing and Painting :

12.1 All interior walls of the buildings should be provided with 3 coats of white washing as per specification. All exterior walls should be provided with 2 coats of colour wash of approved shades over an initial coat of white wash. All doors and windows should be painted with 3 coats of oil paints of approved shades over a priming coat.

13.0 Brick Work :

Brick work should conform to Chapter-V of **Indian Railway Unified Standard Specification Volume-I & II 2010 edition,** locally available bricks of approved quality may be used without changing the clear floor dimension. Payment will be made as per actual works executed for the work under supervision of BBJ and cement will be supplied free as per actual requirement with respect to **Indian Railway Unified Standard Specification Volume-I & II 2010 edition.**

14.0 Structural Steel Works :

14.1 (a) Specifications of all rolled Steel Sections should conform to IS: 226 1962. Payment will be made as per weight of materials as actually required for the work excluding all wastage. Rate also includes all freights, carriage, handling and other constraints.

(b) G.I. pipes for railing and steel materials for ladders should be as per standard specifications. Payment of these also to be made as per freight of materials as actually required excluding all wastage. Rate includes all freight, carriage, handling and other constraints.

15.0 Earthwork in filling :

15.1 It shall be the responsibility of contractor to ensure that no work on filling of earth is commenced until the existing ground levels at difference cross sections have been recorded and such records of levels have been jointly signed and dated by the contractor and the Engineer or his authorized representative. Cross sectional profiles plotted on the basis of the recorded ground levels shall also be jointly signed by the contractor and the Engineer. The points at which the cross-sectional ground levels to be recorded and the extent of leveling work to be done shall be decided by the Engineer.

15.1.1 The contractor may bring the notice of the Engineer such additional cross sections that in his option should be taken for proper assessment of quantities. Such representation, however, should be made before the commencement of any earth work. The Engineer's decision thereon shall, however, be final and binding on the contractor.

15.2 Contractor shall sign every page in the level books and cross section sheets where original ground and final level of completed work are recorded in token of his acceptance of these levels and cross section for the purpose of computation of quantities for payments. No dispute whatsoever shall be entertained on this account.

15.3 The contractor shall clear all shrubs and jungles on the existing ground up to a distance of 3 m from the proposed compound to be filled up. All tree stumps will have to be uprooted from the ground to be covered by the embankments. Up-rooting of trees stumps in the area covered by the formation embankment will not be paid for separately and the rate of earth work including such uprooting of trees

& stumps.

15.4 No extra payments will be admissible for filling up the hollows left after uprooting of tree stumps in the area covered by the embankment. Pre-ground levels as represented by the cross sections taken before commencement of work will not be deemed to be vitiated and will hold good for the assessment of the earth work quantities.

15.5 Benching has to be done on the side long ground where existing slope is not with/without claiming any extra payment.

15.6 The type of soil to be used in the embankment which will be brought from outside the Railway land will be got approved from the Engineer in advance. Organic Clays, Silts.

15.7 Contractor should set out the work according to the plan and as directed by the Engineer or his representative. Reference Page is to be made permanent and kept clear of all constructions. He/they should obtain the approval in writing from the Engineer for the correctness of the site set out and the reference marks before commencing the execution of the work.

15. 8 While carrying out the filling work the contractor will take all necessary precautions to see that no infringement is caused with signaling and other installations and other structures in the smooth movement of traffic along the Railway track in and outside of station limits, If any. License of necessities for doing work of infringement are likely to arise, he shall intimate Engineer in advance of his programme in writing so that necessary arrangements can be provided for carrying out such items of works. Contractor will be fully responsible for disregard of these instructions.

15.9 No extra payment onwards cost of bailing or pumping out water from borrow pits or cutting or foundations excavations will be made. In case the embankment is to be made in marshy or water logged area, no extra payment will be made for such work. It should be clearly understood that the rates quoted are inclusive of all charges for such items incidental to earthwork.

16.0 <u>Specification for Plinth Filling through Watering and Ramming</u> :

(i) After site clearance all pockets and depressions, left in the ground if any, shall be made good and corrected.

(ii) Earthwork shall be done in layers nos. exceeding 15 cms.

(iii) Apart from the above the plinth filling is to be done as per **Indian Railway Unified Standard Specification Volume-I & II 2010 edition.**

17.0 <u>Rate of Earthwork in filling from Railway Land</u> :

17.1 It should be clearly noted that the payment for earthwork item where compaction is to be done through watering and ramming will be made on the basis of the net quantities of earthwork after compaction. Where no such compaction is required the extra earth to be filled @ 15% for shrinkage without claiming any extra payment. This gross quantity will be arrived from the cross sectional areas worked on after plotting the final formation levels over the original ground levels. The total height of filling (including the shrinkage) to be done shall be decided by the Engineer. Extra quantity of earth work beyond the required width and height including shrinkage and beyond the toes of bank will not be paid. The toes of bank will be as per the final slopes for a required profile on the basis of formation levels shown in the longitudinal section. The contractor should quote his rate accordingly.

17.2 In the execution of different items of work such as excavation and concreting in foundations, stone flooring and pitching etc. necessity may arise to construct coffer dams or shall be bounded due to the presence of standing water. It should be clearly understood that claim for extra payment due to such measures shall not be entertained and the rate quoted shall be inclusive of all such measures.

17.3 Excavation in foundations will consist of excavation of soil from trenches of pitching and base walls. The rate quoted will be inclusive of all different classes categories and conditions of soil shoring, timbering, dewatering through all depths and

disposal of surplus excavated soil as directed by the Engineer after filling up the foundation trenches including all leads, lifts and descents. All excavated spoils should be deposited properly at a place or place including filling as directed by the Engineer or his representative. No extra payment for lead, lift or descent for the work will be made to the contractor. The rate quoted will also include the cost of refilling, ramming and leveling the excavated soil in foundation trenches.

17.4 The rates of work in foundations will include the cost of shoring, structuring, timbering and all such measures as may be necessary to retain the side of foundation and filling the trenches with excavated soil including ramming and leveling as directed by the Engineer or his representative. All protection for retaining the existing ground without affecting safety shall be ensured by the contractor. The rate also includes the cost of all dewatering arrangement as may be necessary to complete the excavation unhampered. Extra payment is admissible for wet excavation in foundation or for bailing out or any other dewatering arrangement as may be done for carrying out the work.

17.5 Samples of the following materials shall be submitted to the Engineer or his representative free of charge or testing and approval.

(i) Stone, hard course and filling.
(ii) Aggregates.
(iii) Any other materials as directed by the Engineer.

18.0 Samples, provided to the Engineer or his representative for their retention, are to be in labeled boxes suitable for storage. Materials as workmanship not corresponding in character and quality with approved samples shall be rejected. Samples required for testing and approval must be supplied giving sufficient time to allow for such testing and approval. Due allowance will be made to the fact if samples are rejected and further samples shall be required. Delay to the work arising from the late submission of samples shall not be acceptable as a reason for delay in the completion of the work.

18.1 The testing of the materials may be carried out by the BBJ in any laboratory of its choice if required.

If the materials are not found to comply with the various provisions laid down in the relevant I.S. Codes other relevant standard specifications as these specifications the same shall be rejected irrespective of the test certificate submitted by the Contractor in compliance with Clause 4.8.1 and 4.8.,2.

18.2 In addition, the Engineer shall have the right to require the contractor at any time to draw samples of aggregates or any other materials from stock piles on the site at any other locations to be indicated by the Engineer or his representatives. The samples are to be drawn in accordance with I.S. 2386 and tested in a laboratory approved by the Engineer in accordance with the appropriate Clauses of I.S 2386at the cost of the contractor.

18.3 Tests for the determination of impurities in the sand shall be made once daily until the Engineer is satisfied that the specified compression strength is being regularly obtained, then with his approval, such tests shall be made once weekly and at other times as directed by the Engineer.

CHAPTER-VIII
SPECIAL CONDITIONS & SPECIAL SPECIFICATIONS FOR BRIDGE WORK

SPECIAL CONDITIONS OF CONTRACT AND SPECIFICATIONS FOR BRIDGE WORK

1.1. **Codes & References.**

1.1.1. The works of this contract shall be executed as per specification contained in following codes subject to stipulations contained in special conditions of contract.

Category	Code	Description
Cement		
	IS 269	Spec. For 33 Grade Ordinary Portland Cement (4th Rev.)
	IS 455	Spec. For Portland Slag Cement (4th Revision)
	IS1489	Spec. For Portland Pozzolana Cement (3rd Rev.)
	IS 4031	Methods Of Physical Tests For Hydraulic Cement (1st Rev.)
	IS 4032	Methods Of Chemical Tests For Cements.
	IS 4845	Definition And Terminology Relating To Hydraulic Cement.
	IS 6452	Spec. For High Alumina Cement For Structural Use.
	IS 6909	Spec. For Supersulphated Cement.
	IS 8041	Spec. For Rapid Hardening Portland Cement (2nd Rev.)
	IS 8043	Spec. For Hydrophobic Portland Cement (2nd Rev.)
	IS 8112	Spec. For High Strength Ordinary Portland Cement (1st Rev.)
	IS12269	53 Grade Ordinary Portland Cement.
		Concrete Bridge Code
Concrete		
	IS 383	Spec. For Coarse And Fine Aggregates From Natural Sources For Concrete (2nd Rev.)
	IS 456	Cod Of Practice For Plain And Reinforced Concrete (3rd Rev.)
	IS 516	Methods Of Tests For Strength Of Concrete
	IS 1199	Methods Of Sampling And Analysis Of Concrete
	IS 1791	Spec. For Batch Type Concrete Mixers (2nd Rev.)
	IS 2386 Pt.I To VIII	Methods Of Test For Aggregates For Specific Gravity Density, Voids, Absorption And Bulking.
	IS 2502	Code Of Practice For Bending And Fixing Of Bars For Concrete Reinforcement.
	IS 2505	Spec. For Concrete Vibrators, Immersion Type (2nd Revision).
	IS 2506	Spec. For Screen Board Concrete Vibrators (1st Rev.)
	IS 2514	Spec. For Concrete Vibrating Tables.
	IS 2514 Pt.ii	Spec. For Flyash For Use As Admixture For Concrete
	IS 2514 Pt.iii	For Use As Fine Aggregate For Mortar And Concrete.
	IS 4656	Spec. For Form Vibrators For Concrete.
	IS 4925	Spec. For Concrete Batching And Mixing Plant.
	IS 5816	Method Of Test For Splitting Tensile Strength Of Concrete Cylinders.
	IS 6461	Glossary Of Terms Relating To Cement Concrete.
	IS 6461 Pt.I	Concrete Aggregates
	IS 6461 Pt.iv	Types Of Concrete
	IS 6461 Pt.v	Formwork For Concrete
	IS 6461 Pt.vii	Mixing, Laying, Compaction, Curing & Other Construction Aspects.
	IS 6461 Pt.viii	Properties Of Concrete
	IS 6461 Pt.ix	Structural Aspects
	IS 6461 Pt.x	Tests And Testing Apparatus

	IS 7861 Pt.I	Spec. For Extreme Weather Concreting. Recommended Practice For Hot Weather Concrete.
	IS 7861 Pt.ii	Spec. For Recommended Practice For Cold Weather Concreting. (Under Preparation)
	IS 9013	Method Of Making Curing And Determining Compressive Strength Of Accelerated Cured Concrete Test Specimens.
	IS10262	Recommendations Guidelines For Concrete Mix Design.
General		
	2	Rules For Rounding Off Numerical Values (Revised 1984
	IS 1893	Criteria For EartIluake Resistant Design Of Structure (4th Rev.)
	IS 1904	Code Of Practice For Structural Safety Of Buildings :Shallow Foundations (3rd Rev.)
	IS 1905	Code Of Practice For Structural Safety Of Building Masonry Walls (3rd. Rev.)
	IS 1911	Schedule Of Unit Weights Of Building Materials (1st Rev.)
	IS 2751	Code Of Practice For Welding Of Mil Steel Bars Used For Reinforced Concrete Construction (1st Rev.)
	IS 3025 Pt iv	Methods Of Sampling And Test (Physical And Chemical) For Water Used In Industry. Color (1st Rev.)
	IS 3025 Pt. Vi	Odour Threshold
	IS 3025 Pt.vii	Taste Threshold
	IS 3025 Pt.viii	Taste Rating
	IS 3025 Pt.ix	Temperature
	IS 3025 Pt.x	Turbidity
	IS 3025 Pt.xi	Ph Value
	IS 3025 Pt.xii	Density
	IS 3025 Pt.xiii	Saturation Index (With Respect To Calcium Carbonate)
	IS 3025 Pt.xiv	Specific Conductance (Wheatstone Bridge Conductance Cell)
	IS 3025 Pt.xv	Total Residue
	IS 3025 Pt.xvi	Filterable Residue (Total Dissolved Solids)
	IS 3025 Pt.xvii	Non Filterable Residue (Total Suspended Solids)
	IS 3025 Pt.xviii	Volatile And Fixed Residue (Total Filterable &Nonfilterable)
	IS 3025 Pt.xix	Settleable Matter
	IS 3025 Pt.xx	Dispersion Character(Flow Patterns)
	IS 3025 Pt.xxi	Total Hardness
	IS 3812 Pt.I	Spec. For Flyash For Use As Pozzolana
	IS 3951 Pt.I	Spec. For Structural Hollow Clay Tiles For Floors And Roofs Filler Type (1st Rev.)
		Schedule of Dimensions of BBJs
	IS 3951 Pt.ii	Spec. For Structural Type (1st Rev.)
	IS 4082	Recommendations On Stacking And Storage Of Construction Materials At Site (1st Rev. Construction Of Buildings. (1st Rev.)

	IS 6061 Pt.I	Code of Practice for Construction of Floors and Roofs with Joints And Hollow Filler Blocks: With Hollow Concrete Filler Blocks.
	IS 6061 Pt.ii	Spec. For Construction Of Floors And Roofs With Joints And Hollow Filler Blocks With Hollow Clay Filler Blocks. (1st Rev.)
	IS 6061 Pt.ii	Materials (Other Than Cement And Aggregate)
	IS 6061 Pt.vi	Equipment, Tools And Plant
	IS 9103	For Admixtures For Concrete.
	SP 16	Design Aids For Reinforced Concrete Structure.

PSC		
	IS 1343	Code Of Practice For Prestressed Concrete. (1st Rev.)
	IS 6003	Spec. For Indented Wire For Prestressed Concrete.
	IS 6006	Spec. For Uncoated Stress Relieved Strand For Prestressed Concrete (1st Rev.)
	IS 6006 Pt.xi	Prestressed Concrete.
	IS 6006 Pt.xii	Miscellaneous
Steel		
	IS 226	Spec. For Structural Steel Std. Quality (5th Rev.)
	IS 280	Mild Steel Wire For General Engineering Purpose
	IS 432 Pt I	Spec. For Mild Steel & Medium Tensile Steel Bars And Hard Drawn Steel Wire For Concrete Reinforcement Mild Steel & Medium Tensile Steel Bars(3rd Rev.)
	IS 432 Pt II	Spec. For Mild Steel & Hard Drawn Steel Wire
	IS 1566	Spec. For Hard Drawn Steel Wire Fabric For Concrete Reinforcement (2nd Rev).
	IS 1785 Pt I	Spec. For Plain Hard-Drawn Steel Wire For Prestressed Concrete: Cold-Drawn Stress Relieved Wire. (2nd Revision)
	IS 1785 Pt.II	Spec. For Plain Hard-Drawn Steel Wire For Prestressed Concrete: As Drawn Wire. (1st Revision).
	IS 1786	Spec. For Cold Worked Steel High Strength Deformed Bars For Concrete Reinforcement (3rd Rev.)
	IS 2062	Weldable Structural Steel (3rd. Rev.)
	IS 2090	Spec. For High Tensile Steel Bars Used In Prestressed Concrete. (1st Rev.)
	IS 2090 Pt.iii	Concrete Reinforcement
	IS 9417	Recommendations For Welding Coldworked Steel Bars For Reinforced Concrete Construction (1st Rev.)
	IS 1344	Spec. For Calcined Clay Pozzolana (2nd Revision)

1.1.2. The above is a sample and by no means exhaustive. It is only for general guidance and any Indian Railway Standard Code relevant to the subject shall be referred and followed.

1.2. **General:**

1.2.1. **The exposure condition for this bridge is considered as moderate. All codal provisions corresponding to moderate severe exposure condition would be applicable in this contract.**

1.3. **Cement**

1.3.1. The cement used shall be any of the following. However the prior approval of the Engineer shall be taken for use of any of the cement.

1 33 Grade Ordinary Portland Cement conforming to IS: 269.
2 43 Grade Ordinary Portland Cement conforming to IS: 8112.
3 53 Grade Ordinary Portland Cement conforming to IS: 12269.
4 Rapid hardening Portland cement conforming to IS: 8041.

5 High Strength Portland Cement conforming to IRS:T:40.

6 Portland slag cement conforming to IS:455 (See Note 1.3.3.1 & 1.3.3.4 below).

7 Portland Pozzolana cement conforming to IS:1489 (See note 1.3.3.2 & 1.3.3.4 below).

8 Sulphate resistance cement confirming to IS: 12330 (See note 1.3.3.3 below)

1.3.2. In aggressive environment, where SO_3 and Cl ion are present in abundance, preferably ordinary Portland Cement with moderate sulphate resisting properties conforming to specifications as given in Table 1 may be used.

1.3.3. NOTE:

1.3.3.1 Portland slag cement conforming to IS : 455 may be used for prestressed concrete work, provided slag content in cement is not more than 50%.

1.3.3.2 Portland Pozzolana cement shall not be used for PSC works. When Portland Pozzolana cement is used, it is to be ensured that proper damp curing of concrete is done at least for 14 days and supporting formwork is not removed till concrete has attained at atleast 75 % of the design strength.

1.3.3.3 The sulphate resisting cement conforming to IS:12330 shall be used only in such conditions where the concrete is exposed to the risk of excessive sulphate attack e.g. concrete in contact with soil or ground water containing excessive amount of sulphate. It shall not be used under such conditions where concrete is exposed to risk of excessive chlorides and sulphate attack both.

1.3.3.4 The rate of development of strength is slow in case of blended cement i.e. Portland Pozzolana cement and Portland slag cement, as compared to ordinary Portland cement. This aspect should be taken care while planning to use blended cement. Accordingly stage of prestressing, period of removal of form work and period of curing etc. should be suitably increased.

Table 1 :

Specification For Ordinary Portland Cement

(With Moderate Sulphate Resisting Properties)

Sl No	Characteristics	Limits	
		Not less than	Not more than
1	Ratio Of Percentage Of Lime To Percentage Of Silica, Alumina And Iron Oxide, When Calculated By The Formula Given In IS 269.	0.80	1.02
2	Ratio of percentage of Alumina to that of Iron Oxide.	0.86	--
3	Magnesia, (% by Wt.)	--	5.0
4	Loss on ignition (% by Wt.)	--	4.0
5	Tricalcium aluminate content (C_3A) (%)	6.0	10.0
6	Tricalcium silicate contents (C_3S) (%)	40.0	--
7	Physical properties fineness (cm^2/g)	2800	3200
8	Soundness 'Le Chatalier' method (mm)	--	5
9	Setting Time		
(a)	Initial (in minutes)	60	--
(b)	Final (in minutes)	--	600
10	Compressive Strength		
(a)	7 days (N/mm^2)	29.5	--
(b)	28 days (N/mm^2)	41.7	--

1.3.3.5 The method of testing to determine the above characteristics and ascertaining the results, shall conform to the procedure prescribed in IS:269, 4031 & IS:4032.

1.4. **Reinforcement**

1.4.1. The reinforcement shall be any of the following :

- Grade I mild steel and medium tensile steel bars conforming to IS:432 (Part I)
- Cold twisted bars conforming to IS:1786 -1985
- Thermo – Mechanically treated (TMT) bars satisfying requirements of IS : 1786-1985.
- Rolled steel made from structural steel conforming to IS:2062 Gr. A and Gr. B.

1.4.2. All reinforcement shall be free from loose mill scales rust and coats of paints, oil, mud or other coatings that may destroy or reduce bond.

1.4.3. The modulus of elasticity of steel shall be taken as 200 KN/mm2.

1.5. **Prestressing Steel**

1.5.1. The prestressing steel shall be any of the following :-

- Plain hard-drawn steel wire conforming to IS:1785 (Part I).
- Uncoated stress-relieved strands conforming to IS:6006.
- High tensile steel bars conforming to IS:2090.

1.5.2. All prestressing steel shall be free from splits, harmful scratches, surface flaws, rough, jagged and imperfect edges and other defects likely to impair its use in Prestressed concrete.

1.6. **Coarse Aggregates**

1.6.1. For plain and reinforced cement concrete or Prestressed concrete works, coarse aggregate shall consist of clean, hard, strong, dense, non-porous and durable pieces of crushed stone, crushed gravel, natural gravel or a suitable combination there of or other approved inert material. They shall not contain pieces of disintegrated stones, soft, flaky elongated particles, salt, alkali, vegetable matter or other deleterious materials in such quantities as to reduce the strength of durability of the concrete, or to attack the steel reinforcement. All coarse aggregates shall be tested to conform to IS:383. Coarse aggregate having positive alkali – silica reaction shall not be used.

1.6.2. For reinforced cement concrete works, the maximum size of the coarse aggregate can be in the limits of 4.75 to 40 mm but in no **case should be greater than one quarter of the minimum thickness of the member, provided that the concrete** can be placed without difficulty so as to surround all reinforcement thoroughly and to fill the corners of the form work.

1.6.3. The preferred nominal size of aggregate is 20 m for reinforced cement concrete works. Larger sizes upto 31.5 mm may be permitted in special cases where there is no restriction to flow of concrete in a section. If smaller sizes are necessary for any element, 10 mm and 12.5 mm may be used.

1.6.4. For plain cement concrete works, preferred nominal sizes shall be 20 and 40 mm. Larger sizes may be permitted only in special cases, subject to supplemental specifications and precautions.

1.6.5. For prestressed concrete works, the nominal maximum size of aggregate shall usually be restricted to 10 mm less than the minimum clear distance between individual cables or individual untensioned steel reinforcement or 10 mm less than the minimum clear distance between individual cables or individual untensioned steel reinforcement or 10 mm less than the minimum cover to untensioned steel reinforcement whichever is smaller. A nominal size of 20 mm coarse aggregate shall generally be considered satisfactory for prestressed concrete works. Primary or Secondary stone crusher should be employed for getting proper size and grading of coarse aggregates.

1.7. **Sand/Fine Aggregates**

1.7.1. For masonry work, sand shall conform to the requirement of IS:2116. For plain and reinforced cement concrete or prestressed concrete works, fine aggregates shall consist of hard, strong, durable, clean particles of natural sand, crushed stone or crushed gravel or suitable combination of natural sand and crushed stone or gravel. They shall not contain dust, lumps, soft or flaky materials, mica and other deleterious materials in such quantities as would reduce the strength or durability of concrete or attack the embedded steel. Motorised sand washing machines should be used for removing impurities from sand. All fine aggregates shall be tested to conform to IS:383.

1.8. **Water**

1.8.1. Water used for mixing and curing shall be clean and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete or steel. Potable water is generally considered satisfactory for mixing concrete. As a guide, the following concentrations represent the maximum permissible values.

1.8.2. To neutralise 200 ml sample of water, using phenolphthalein as an indicator, it should not require more than 2 ml on 0.1 normal NaOH.

1.8.3. To neutralise 200 ml sample of water using methyl orange as an indicator, it should not require more than 10 ml of 0.1 normal HCL.

1.8.4. The permissible limits for solids shall be as follows :

Item	Permissible limits (Maximum)
Organic	**200 mg/lit**
Inorganic	**3000 mg/lit**
Sulphates (SO4)	**500 mg/lit**
Chlorides (Cl)	**250 mg/lit***
Suspended matter	**2000 mg/lit**

1.8.5. In case of structures of length 30 m and below, the permissible limit of chlorides may be 1000 mg/lit.

1.8.6. All samples of water (including potable water) shall be tested and suitable measures taken where necessary.

1.8.7. The PH value shall generally be not less than 6. Whenever necessary tests should be done as per IS:3025. Mixing and curing with sea water shall not be permitted.

1.9. **Workability of Concrete**

1.9.1. The concrete mix proportions chosen should be such that the concrete is of adequate workability for the placing conditions of the concrete and can be properly compacted with the means available.

1.9.2. Suggested ranges of workability of concrete for some placing conditions are given in Clause 6.1 of IS : 456.

1.10. **Durability**

1.10.1. The durability of concrete depends on its resistance to deterioration and the environment in which it is placed. The resistance of concrete to weathering, chemical attack, abrasion, frost and fire depends largely upon its quality and constituents materials. Susceptibility to corrosion of the steel is governed by the cover provided and the permeability of concrete. The cube crushing strength along is not a reliable guide to the quality and durability of concrete; it must also have an adequate cement content and a low water-cement ratio. The general environment to which the concrete will be exposed during its working life is classified in five levels of severity that is mild, moderate, severe, very-severe and extreme, as described below.

ENVIRONMENT	EXPOSURE CONDITION
Mild	Concrete surface protected against weather or aggressive conditions.
Moderate	Concrete surface sheltered from severe rain or freezing whilst wet concrete exposed to condensation, concrete structure continuously under water, concrete in contact with non-aggressive soil/ground water.
Severe	Concrete surface exposed to severe rain, alternate wetting and drying or occasional freezing or severe condensation. Concrete exposed to aggressive sub-soil/ground water or coastal environment
Very severe	Concrete surface exposed to sea water spray, corrosive fumes or severe freezing conditions whilst wet
Extreme	Concrete structure surfaces exposed to abrasive action surfaces of members in tidal zone.

1.10.2. Permeability

One of the main characteristics influencing the durability of any concrete is its permeability. Therefore, tests for permeability shall be carried out for concrete bridges as recommended in clause 1.2.2.2 with strong dense aggregates, a suitability low permeability is achieved by having a sufficiently low water cement ratio, by ensuring as through compaction of the concrete as possible and by ensuring sufficient hydration of cement through proper curing methods. Therefore, for given aggregates, the cement content should be sufficient to provide adequate workability with a low water-cement ratio so that concrete can be completely compacted by vibration. Test procedure for penetration measuring permeability has been given in appendix – G. The depth of penetration of moisture shall not exceed 25 mm.

1.10.2.1. Permeability test :

i. Permeability test shall be mandatory for all RCC/PCC bridges under severe, very severe and extreme environment.

ii. Under mild and moderate environment, permeability test is desirable to the extent possible.

iii. Permeability test is required for RCC/PCC structural element only.

1.10.3. Maximum Water-Cement Ratio : The limits for maximum water cement ratio for design mix shall be based on environmental conditions as defined in Clause 1.10.1. The limits for maximum water-cement ratio for different environmental shall be as given in table below :

MAXIMUM WATER CEMENT RATIO (CL : 1.10.3)

Environment	Plain concrete (PCC)	Maximum water – Cement Ratio	
		Reinforced concrete (RCC)	Prestressed concrete (PSC)
Mild	0.55	0.45	0.40
Moderate	0.50	0.40	0.40
Severe	0.45	0.40	0.40
Very severe	0.45	0.38	0.35
Extreme	0.40	0.35	0.35

1.10.4. Minimum Grade of concrete : From durability consideration, depending upon the environment to which the structure is likely to be exposed during its service life, minimum grade of concrete shall be as given below :

MINIMUM GRADE OF CONCRETE

Environment	Minimum Grade of concrete		
	Plain concrete (PCC)	Reinforced concrete (RCC)	Prestressed concrete (PSC)
Mild	M-20	M-25	M-35*
Moderate	M-25	M-30	M-35*
Severe	M-25	M-35	M-45
Very severe	M-30	M-40	M-50
Extreme	M-30	M-45	M-50

* Minimum grade of concrete shall be M – 40 for Pre-tensioned prestressed concrete structures.

Cementitious material content : Depending upon the environment to which the structure is likely to be exposed during its service life, minimum cementitious material content in concrete shall be as given in table below. Maximum cementitious material content shall be limited to 500 kg/M^3

Environment	Minimum Grade of concrete		
	Plain concrete (PCC)	Reinforced concrete (RCC)	Prestressed concrete (PSC)
Mild	300	350	400
Moderate	350	400	400
Severe	380	400	430
Very severe	400	430	440
Extreme	400	430	440

1.10.5. Total chloride contents : The total chloride content by weight of cement shall not exceed the following values :

a) For prestressed concrete works :-

i) Under extreme and very severe environment 0.06%

ii) Under severe moderate and mild environment 0.10%

b) For RCC works 0.15%

1.10.6. Coating for concrete :

1.10.7.1. In order to provide adequate resistance against corrosion of embedded material in RCC structures, concrete shall be provided with suitable coating depending upon the environmental conditions. The recommended coating is as under :

Aggressive Environment (Severe, very Severe & Extreme)		Non agressive environnement (Mid & Moderate)
Super structure of bridges	Substructure of bridges (in affected part only)	All structures
Epoxy – Phenolic IP – coating CECRI Integrated four coat. System	Coaltarapoxy coating	No coating is necessary.

1.11. **Concrete Mix Proportions.**

1.11.1. Mix Proportion: The mix proportions shall be selected to ensure that the workability of the fresh concrete is suitable for the conditions of handling and placing, so that after compaction its surrounds all reinforcements and completely fills the formwork. When concrete gets hardened, it shall have the required strength, durability and surface finish.

1.11.2. The determination of the proportions of cement, aggregates and water to attain the required strengths shall be made as follows :-

1.11.3. By designing the concrete mix; such concrete shall be called 'Design mix concrete' ; or

1.11.4. By adopting nominal concrete mix; such concrete shall be called 'Nominal mix concrete'

1.11.5. Design mix concrete is preferred to nominal mix. Nominal mixes when used, are likely to involve a higher cement content. Concrete of grades richer than M 20 shall only be design mix concrete.

1.12. **Design Mix Concrete**

1.12.1. The mix shall be designed to produce the grade or concrete having the required workability, durability and a characteristic strength not less than appropriate values given in Table 2. The procedure given in IS : 10262 may be followed for mix design.

1.12.2. Nominal Mix Concrete : Nominal Mix Concrete may be used for concrete of grade M 20 or lower. The proportions of materials for nominal mix concrete shall be in accordance with Concrete Bridge Code

1.13. **Mix Design**

1.13.1. Concrete mix shall be designed on the basis of preliminary tests. The proportions for ingredients chosen shall be such that concrete has adequate workability for conditions prevailing on the work in question and can be properly compacted with the means available.

1.13.2. The mixing plant and the methods of transporting and depositing the concrete to be employed in the work shall be used to simulate working conditions with the trial mixes.

1.13.3. All these preliminary tests, approval etc. shall be got done well in advance by the contractor before any concreting is contemplated. Failure on the part of the Contractor to do so and the consequent delay in the completion of the works will not entitle him for any compensation whatsoever, either financially, or by way of extension of time.

1.14. **Mix proposals :**

1.14.1. Based upon the successful preliminary crushing and workability tests, the Contractor shall submit mix proposals to the engineer, who will have the right to reject any trial mix not deemed satisfactory. Selection of the trial mix to the complete satisfaction of the Engineer shall be the ultimate responsibility of the contractor.

1.14.2. Except where it can be shown to the satisfaction of the Engineer that supply of properly graded aggregate of uniform quality can be maintained till the completion of work, grading of aggregate should be controlled by obtaining the coarse aggregate in different sizes and blending them in the right proportions as required. Different sizes, however, shall be stocked in separate stock Wells, Required quantity of materials shall be stock-Welld several hours, preferably a day, before use. Grading of coarse and fine aggregate shall be checked as frequently as possible, frequency for a given job being determined by the engineer to ensure that the suppliers are maintaining uniform grading as approved for samples used in the preliminary tests.

1.14.3. In proportioning concrete, the quantity of both cement and aggregate shall be determined by weight. Where the weight of cement is determined by accepting the maker's weight per bag, a reasonable number of bags shall be weighed separately to check the net weight. Where cement is weighed from bulk stocks at site and not by

bags, it shall be weighed separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipment shall be maintained in a clean and serviceable condition. Their accuracy shall be periodically checked.

1.14.4. It is most important to keep the specified water cement ratio constant and at its correct value. To this end, moisture content in both fine and coarse aggregates shall be determined as frequently as possible, frequency for a given job being determined by the Engineer according to the weather conditions. The amount of mixing water shall then be adjusted to compensate for variations in the moisture content. For the aggregates, IS ; 2386 (Part III) shall be referred to. Suitable adjustments shall also be made in the weights of aggregates to allow for the variation in weight of aggregates due to variation in their moisture content.

1.15. **Mixing concrete**

1.15.1. Batching and mixing of the concrete shall be done at a central batching and mixing plant with automatic controls, located at an approved distance duly considering the properties of the mixes and the transporting arrangements available with the Contractor. The Engineer shall approve the plant

1.16. **Proportioning of materials**

1.16.1. Proportioning of materials shall be done on the batching plant by weight, each type of material being weighed separately. The cement from the bulk stock shall be weighed separately. The cement from the bulk stock shall be weighed separately from the aggregate and water shall be measured by volume.

1.16.2. The capacity of batching and mixing plant shall be atleast 25 percent higher than the capacity for transportation and laying of concrete.

1.16.3. All drums that have been out of use for more than 30 minutes shall be thoroughly cleaned before any fresh concrete is mixed in them.

1.17. **Transporting, placing and compaction of concrete.**

1.17.1. Chutes, hoists and winches, transit mixer and agitators and concrete pumps shall do transportation of concrete.

1.17.2. The Engineer shall approve the method of transporting and placing concrete. Concrete shall be so transported and placed that no contamination, segregation or loss of its constituent materials takes place. All formwork cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete.

1.17.3. No concrete shall be placed in any part of the structure until the approval of the Engineer has been obtained.

1.17.4. If concreting is not started within 24 hours of the approval being given, it shall have to be obtained again from the Engineer. Concreting then shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete that has been in position for more than 30 minutes unless a proper construction joints is formed.

1.18. **Concreting under Water**

1.18.1. When it is necessary to deposit concrete under water, the methods, equipment, materials and proportions of the mix to be used shall be got approved from the Engineer before any work is started. Such concrete shall not be considered as “Controlled Concrete”.

1.18.2. Concrete shall not be placed in water having a temperature below 5^{o} C. The temperature of the concrete, when deposited, shall be not less than 16^{o} C, not more than 40^{o} C.

1.18.3. Concrete shall contain 10 per cent more cement than that required for the same mix placed in the dry. The material shall be so proportioned as to produce a concrete having a slump of not less than 150 mm, and not more than 200 mm. The slump shall be tested as per IS:516.

1.18.4. Coffer-dams or forms shall be sufficiently tight to ensure still water conditions, if practicable, and in any case to reduce the flow of water to less than 3 meters per

minute through the space into which concrete is to be deposited. Cofferdams or forms in still water shall be sufficiently tight to prevent loss of mortar through the joints in the walls. Pumping shall not be done while concrete is being placed, or until 24 hours thereafter.

1.18.5. All under water concreting should be carried out by tremie method only, with tremie of appropriate diameter. The number and spacing of the tremie should be worked out to ensure proper concreting. The tremie concreting when started should be continued without interruption for the full height of the member being concreted. The concrete production and placement equipment should be sufficient to enable the underwater concrete to be completed uninterrupted within the stipulated time. Necessary stand-by equipment should be available for emergency situation.

1.18.6. The top section of the tremie shall be a hopper large enough to hold one full batch of the mix or the entire contents of the transporting bucket if any. The tremie pipe shall not be less than 200 mm in diameter, and shall be large enough to allow a free flow of concrete and strong enough to withstand the external pressure of the water in which it is suspended, even if a partial vacuum develops inside the pipe. Preferably, flanged steel pipe of adequate strength for the job shall be used. A separate lifting device shall be provided for each tremie pipe with its hopper at the upper end. Unless the lower end of the pipe is equipped with an approved automatic check valve, the upper end of the pipe shall be plugged with a wadding of gunny sacking or other approved material before delivering the concrete to the tremie pipe through the hopper, so that when the concrete is forced down from the hopper to the pipe it will force the plug (and along with it any water in the pipe) down the pipe and out of the bottom end, thus establishing a continuous stream of concrete. It will be necessary to raise slowly the tremie in order to allow in uniform flow of concrete, but it shall not be emptied so that water enters above the concrete in the pipe. At all times after the placing of concrete is started and until all the required quantity has been placed, the lower end of the tremie pipe shall be kept below the surface of the plastic concrete. This will cause the concrete to build up from below instead of flowing out over the surface, and thus avoid formation of layers of laitance. If the charge in the tremie is lost while depositing, the tremie shall be raised above the concrete surface, and unless sealed by a check valve it shall be replugged at the top end, as at the beginning, before refilling for depositing further concrete.

1.18.7. To minimize the formation of laitance, great care shall be exercised not to disturb the concrete as far as possible while it is being deposited.

1.19. **Protection and Water curing**

1.19.1. Curing is the process for preventing the loss of moisture from the concrete. The prevention of moisture loss from the concrete is particularly important if the water-cement ratio is low.

1.19.2. Curing and protection shall start immediately after the compaction of the concrete to protect it from

1.19.3. Premature drying out, particularly by solar radiation and wind.

1.19.4. High internal thermal gradients.

1.19.5. Leaching out by rain and flowing water.

1.19.6. Rapid cooling during the first few days after placing.

1.19.7. Low temperature or frost.

1.19.8. Vibration and impact which may disrupt the concrete and interfere with its bond to the reinforcement.

1.19.9. Where members are of considerable size and length, with high cement content, accelerated curing methods are to be applied, as approved in detail by the Engineer.

1.19.10. Exposed surfaces of concrete shall be kept continuously in a damp or wet condition by ponding or by covering with a layer of sacks, canvas, hessian, or similar

materials and shall be kept constantly wet for a period of not less than fourteen days from the date of placing of concrete.

1.19.11. Special attention should be paid to curing of concrete in order to ensure maximum durability and to minimize cracking.

1.19.12. Sea water shall not be used for curing. Sea water shall not come into contact with concrete members unless it has attained the desired strength.

1.19.13. Masonry work over the foundation concrete may be started after 48 hours of its laying but the curing of concrete shall be continued for a minimum period of 14 days.

1.19.14. Wherever possible, use of water sprinklers or perforated pipes should be encouraged for curing of concrete. Such arrangements must be maintained for a minimum period of 14 days after concreting.

1.19.15. Approved concrete curing compounds should be preferred where water curing cannot be done reliably.

1.20. **Working in Extreme Weather**

1.20.1. Where concrete is to be deposited at or near freezing temperatures, precautions shall be taken to ensure that at the time of placing it has a temperature of not less than 5 ^{o} C and that the temperature of the concrete shall be maintained above 4 ^{o} C until it has thoroughly hardened. When necessary, concrete ingredients shall be heated before mixing. Cement shall however not be heated other than by the heat transmitted to it from other ingredients of the concrete. In general, heating the mixing water along to about 66^{o} C may suffice for this purpose. Dependence shall not be placed on salt or other chemicals for the prevention of freezing. Calcium chloride upto one and a half per cent by weight of the cement can be used to accelerate the rate of hardening provided it does not accelerate corrosion. Use of calcium chloride in excess of this percentage is considered harmful. No frozen material or materials containing ice shall be used. All concrete damaged by frost shall be removed. It is recommended that concrete exposed to freezing weather shall have entrained air and the water content of the mix shall not exceed 30 litres per 50 Kg of cement.

1.20.2. When depositing concrete in very hot weather, precautions shall be taken so that the temperature of wet concrete does not exceed 40^{o} C while placing. This shall be achieved by stacking aggregate under the shade and keeping them moist, using cold water, reducing the time between mixing and placing to the minimum, cooling formwork by sprinkling water, starting curing before concrete dries out and restricting concreting, as far as possible, to mornings and evenings.

1.21. **Finishing**

1.21.1. Immediately after the removal of forms, all exposed bars or bolts passing through the reinforced cement concrete member and used for shuttering or any other purpose shall be cut inside the reinforced cement concrete member to a depth of at least 25 mm below the surface of the concrete and the resulting holes be closed by cement mortar. All fins caused by form joints, all cavities produced by the removal of form ties and all other holes and depressions, honeycomb spots, broken edges or corners, and other defects, shall be thoroughly cleaned, saturated with water, and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the proportions used in the grade of concrete that is being finished and of as dry a consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure thorough filling in of all voids. Surfaces that have been pointed shall be kept moist for a period of twenty-four hours.

1.21.2. All construction and expansion joints in the completed work shall be left carefully tooled and free from any mortar and concrete. Expansion joint filler shall be left exposed for its full length with clean and true edges.

1.21.3. Formwork shall include all temporary or permanent forms required for forming the concrete, together with temporary construction required for their support.

1.22. **Storage, testing and acceptance of Materials**

1.22.1 **General**

1.22.1.1. All materials may be stored in proper places so as to prevent their deterioration or intrusion by foreign matter and to ensure their satisfactory quality and fitness for the work. The storage space must also permit easy inspection, removal and storage of the materials. All such materials even though stored in approved godowns/places, must be subjected to acceptance test prior to their immediate use.

1.22.2 **Cement**

1.22.2.1. Cement shall be transported, handled and stored on the site in such a manner as to avoid deterioration or contamination. Cement shall be stored above the ground level in perfectly dry and watertight sheds and shall be stacked not more than eight bags high. Wherever bulk storage containers are used their capacity should be sufficient to cater to the requirement at site and should be cleaned at least once every 3 to 4 months.

1.22.2.2. Each consignment shall be stored separately so that it may be readily identified and inspected and cement shall be used in the sequence in which it is delivered at site. Any consignment or part of a consignment of cement that has deteriorated in any way, during storage, shall not be used in the works and shall be removed from the site by the contractor without any extra cost to BBJs.

1.23. **Bending of Reinforcement**

1.23.1. Reinforcing steel shall conform accurately to the dimensions given in the Bar Bending Schedules shown on relevant drawings.

1.23.2. Bars shall be bent cold to the specified shape and dimensions or as directed the Engineer using a proper bar bender, operated by hand or power to attain proper radii of bends.

1.23.3. Bars shall not be bent or strengthened in a manner that will injure the material.

1.23.4. Bars bent during transport or handling shall be straightened before being used on work, they shall not be heated to facilitate bending.

1.23.5. Unless otherwise specified the type of hook to be provided at the end of each bar shall be indicated in the bar bending schedule. The hook shall be suitably encased to prevent any splitting of concrete.

1.24. **Placing of reinforcement**

1.24.1. **General**

1.24.1.1. All reinforcement shall be free from rust, loose mill scale or coats of oil, paints etc. and chloride contamination which may destroy bond. This may be ensured either by using reinforcement fresh from the factories or thoroughly cleaning all reinforcement to remove all the rust using any effective method such as sand blasting.

1.24.1.2. The reinforcement cage should generally be fabricated in the yard at ground level and then shifted and placed in position. The reinforcement shall be provided strictly in accordance with the drawings and shall be assembled in position only when the structure is otherwise ready for placing of concrete. Prolonged time gap between the assembling of reinforcements and placing of concrete that may result in rust formation of the surface shall not be permitted.

1.24.1.3. Reinforcement bars shall be placed accurately in position as shown in the drawings. The bars, crossing one another shall be tied together at every intersection with galvanized wire of not less than 1 mm in dia and conforming to IS : 280 to make the skeleton of the steel work rigid so that the reinforcement does not get displaced during the deposition of concrete, or any other operation of the work.

1.24.1.4. The bars shall be kept in position by the following paragraphs maintaining cover.

1.24.1.5. In case of beam and slab construction, industrially produced polymer cover blocks of thickness equal to the specified cover shall be placed between the bars and shuttering subject to satisfactory evidence that the polymer composition is not

harmful to concrete and reinforcement so as to secure and maintain the requisite cover of concrete over reinforcement. If such cover blocks are not available concrete cover blocks made of concrete having same strength and specification as of the member may be provided.

1.24.1.6. In case of dowels for columns and walls, the vertical reinforcement shall be kept in position by means of timer templates with slots accurately cut in tem; or with industrially produced polymer cover blocks tied to the reinforcement. Timber templates shall be removed after the concrete has progressed upto a level just below them

1.24.1.7. Spacer bars shall separate layers or reinforcements at approximately 1000 mm intervals. The minimum diameter of spacer bars shall be 12 mm or equal to maximum size of main reinforcement or maximum size of coarse aggregate whichever is greater.

1.24.1.8. Necessary stays, blocks, metal chairs spacers, metal hangers, supporting wires etc., or other subsidiary reinforcement shall be provided to fix the reinforcements firmly in its correct position. The cost of such subsidiary reinforcement will not be paid and shall be included in the steel price quoted.

1.24.2. **Precautions:**

1.24.2.1. Main reinforcement shall not be allowed to sag between supports.

1.24.2.2. Projecting reinforcement

1.24.2.3. Reinforcements projecting from surface of newly placed concrete shall be supported in such a way that there is no sag or risk or damage the newly placed concrete. In severe environment, such projecting reinforcements that are likely to remain exposed for a long time shall be protected by cement grout/anti-corrosive treatment. In case of cement grout the same shall be thoroughly cleaned and wire brushed before depositing fresh concrete.

1.25. **Admixtures**

1.25.1. Use of admixtures and superplasticizers for concrete shall be encouraged to improve workability, quality and reliability.

1.25.2. The plasticizer/retarder/admixture shall conform to IS:6925& IS 9103. They should be chloride free and free and low in sulphate content. The contractor at his cost shall be test each lot of admixture. The use of admixture shall be made as per the manufacturer's guidelines. Prior approval of engineer is necessary for its uses.

1.26. **Design of formwork:**

1.26.1. The contractor without any extra cost to the BBJs shall design formwork including complete false work and shall be got approved by the Engineer. **Only steel formwork shall be used.**

1.26.2. The formwork should be robust and strong and the joints should be leak-proof. The staging, scaffolding and shuttering are required to be properly designed so that their erection as well as striking can be conveniently done. The design should also ensure that at the time of striking, the concrete does not get disturbed and the forms are conveniently removed. For this, wooden or other type of packing should be designed and placed in position for easy removal of the form work.

1.26.3. The contractor shall be entirely responsible for the adequacy and safety for form work notwithstanding any approval or review by the Engineer of his drawing and design.

1.26.4. If proprietary system of formwork is used, a detailed information as per shall be furnished to the Engineer for approval.

1.26.5. Number of joints in the formwork should be kept minimum in both directions – horizontal and vertical – by using large size panels. The design should provide for proper "soldier" to facilitate alignment to the required degree. All joints must be properly sealed. Use of PVC joints sealing tapes, foam rubber or PVC T-Section is essential to prevent leakage of grout.

1.26.6. Bally should not be used as staging. Staging must have cross bracing and diagonal bracing in both directions.

1.26.7. Where centering or launching trusses are adopted for casting of superstructure, the joints of the centering trusses, whether welded, riveted or bolted should be thoroughly checked before proceeding with the concreting. Also, various members of the centering trusses should be examined for proper alignment and unintended deformation before proceeding with the concreting.

1.26.8. For distribution of load and load transfer to the ground through staging, an appropriately designed base plate must be provided which shall rest on firm sub-stratum. Water used for curing should not be allowed to stagnate near the base plates supporting the staging and should be properly drained.

1.26.9. The design of falsework should be such as to facilitate proper and safe access to all parts for inspection.

1.26.10. Removal of the form should be planned as a part of the total formwork design. For piers taller than 30 meters, slip forming shall be preferred.

1.26.11. The chamfers, bevelled edges and mouldings shall be made in the formwork itself. Opening for fixtures and other fittings connected with service shall be provided in the shuttering as directed the Engineer.

1.26.12. As far as practicable, clamps shall be used to hold the forms together. Where use of nails is unavoidable minimum number of nails shall be used and these shall be left projecting so that they can be easily withdrawn. Use of double headed nails shall be preferred.

1.26.13. The formwork shall be made so as to produce a finished concrete true to shape, line levels, plumb and dimensions as shown on the drawing, subject to the following tolerance unless otherwise specified in these documents or drawings or as directed by the Engineer.

a)	Sectional dimension	± 5mm or 2% of dimension whichever is less
b)	Plumb	± 1 in 1000 of height
c)	Levels	± 3 mm before any deflection has taken place.

1.26.14. Tolerance given above are specified for local aberration in the finished concrete surface and structure taken as a whole or for the setting and alignment of formwork, which should be as accurate as possible to the entire satisfaction of the Engineer.

1.27. **Removal of formwork**

1.27.1. The formwork shall be so removed as not to cause any damage to concrete. Centring shall be gradually and uniformly lowered in such a manner as to avoid any shock or vibration. Supports shall be removed in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually.

1.27.2. The whole of the formwork removal should be planned and a definite scheme of operation worked out.

1.27.3. In no circumstances should forms be struck until the concrete reaches a strength of at least twice the stress to which the concrete may be subjected at the time of striking but not before the period as mentioned in IS : 466, where ordinary Portland cement is used.

1.27.4. Where possible the formwork should be left as long as it would assist curing. Form should be eased carefully in order to prevent the load being suddenly transferred in order to avoid shock or vibration. The Enginee

1.27.5. r shall be informed in advance by the Contractor of his intention of striking any formwork and the prior approval of Engineer shall be taken.

1.27.6. The following guidelines may be followed to determine the time of removal of formwork:

Walls, piers and abutment columns and vertical faces of structural members	48 hrs
Soffits of slabs	14 days
Soffits of beams	21 days

1.27.7. It shall be ensured that the marks of the joints between panels are not seen on the finished concrete surface. After manufacture and before fixing each formwork shall be got approved by the Engineer.

1.28. **Discoloration**

1.28.1. Formation of blotches and stains due to detachment of formwork panel from the concrete when adjacent portion in the same lift is till adhering, shall not be allowed to occur, and for this purpose, all shutters shall be struck off at the same time.

1.29. **Ties**

1.29.1. Uses of ties shall be very much restricted, as far as practicable. Wherever ties are used they shall be used with HDPE sheathing so that the ties can be easily removed and no projecting parts prone to corrosion are left. The sheathing shall be grouted with cement mortar of the same strength as that of the structure. Formwork shall be supported without ties by propping against staging erected firmly for the purpose.

1.30. **Clean up**

1.30.1. After forms are stripped all materials to be reused shall be thoroughly cleaned. Holes bored by driving in common corks or formed plastics patching plaster may also be used to fill small holes. After cleaning and before refixing formwork shall be got approved by the Engineer.

1.31. **Number of uses**

1.31.1. Formwork and staging shall be so used so as to maintain quality of the exposed surface. However, if in the opinion of the Engineer, any particular panel/member has become unsatisfactory for use at any stage, the same will be rejected. However the maximum number of uses shall be limited to 20 times since only steel formwork is to be use.

1.32. **Formwork for exposed concrete work**

1.32.1. All exposed concrete surfaces are to have form finish and shall be cast in an approved formwork and shall be free of honeycombing, fins, projections and air holes.

1.32.2. The Contractor shall submit shuttering drawings and details of pattern and the method of forming joints in the exposed (form-finish) concrete to the Engineer for his approval and all changes and modification by the former and final approval thereof obtained, from the Engineer.

1.32.3. In all types of formwork to form finished exposed concrete, only non-staining mould oil supplied by an approved manufacturer shall be used.

1.32.4. The repetitive usage's of the same formwork to cast form finished exposed concrete shall be as decided by the Engineer and in no case the formwork not guaranteed to produce the required form finish to the satisfaction of the Engineer shall be used.

1.32.5. The exposed concrete shall have uniform finish. The finish of the concrete when shuttering and formwork are removed, will generally be without any blemish and will not require touch up. Slight touch up for a small spot or two, if necessary shall be carried out expertly so as to be harmonious with the entire surface.

1.33. **Temporary Structures**

1.33.1. Before start of work contractor should submit a detailed layout plan of Camp/Structure being created to facilitate completion of work to Engineer. The plan should be elaborate and along with design. This should include camp, casting yard, batching plant, temporary sheds and temporary bridges etc.

1.34 Setting out of Bridge

1.34.1. Set out for the bridge would be given by the contractor based upon reference points that would be established by them. Detailed Scheme of setout, establishment of reference points etc would however be submitted to Engineer for their approval.

1.34.2. Permanent pillars would be established which should facilitate easy checking of alignment/center point/Level at each stage of work.

1.34.3. Maintaining correct line and level of all the Bridge would be responsibility of contractor not withstanding alignment/centerline/level are checked by Engineer at regular intervals.

1.34.4. Contractor should make available all necessary facilities namely instruments, labour etc to Engineer/ his representative to enable them check of alignment/ Centerpoint/ Level at every stage.

1.35 **Slip form shutter**

1.35.1 Slip Form Shuttering: Hydraulic slip form shuttering shall be used for the construction of bridge piers.

Complete slip form consisting of hydraulic jacks, yokes, shuttering plates hydraulic hoses, jack rods, working platform, hanging scaffolds along with fittings and fixtures and necessary spares shall be supplied by the contractor assembled in the proper places and in the proper manner maintained and kept operational till the completion of the job. The design of the slip form shuttering shall be such as to prevent the tendency of the pier/abutment shaft to rotate about its vertical axis or to drift laterally in any direction. Sufficient capacity of jacks shall be provided to achieve uniform raising of the entire forms. The contractor shall also mention the number and diameter of jack rods he intends to use for each pier/abutment. Jack rods may be removed either during the work or after completion of the work.

The shuttering plate thickness shall not be less than 5 mm.

The contractor shall also show in the drawing the method of lifting and distributing concrete into form and get it approved by the Engineer. Sufficient number of lifts will be provided to keep pace with the slip forming.

Slip form operation shall generally be executed in a continuous, round the clock manner resulting in monolithic structure without horizontal joints. However, should there be stoppage of slipping operation due to any reason the construction joint so created shall be treated in a manner similar to those for fixed form joints. The cycle of operation commencing from the stage when the forms are filled with concrete after erection of the slip form in proper position and proper manner, is to raise the form with the help of jacks until the belt of form work has been evenly raised to about 250 mm or so. The horizontal reinforcement for this height shall be placed in position and concrete deposited and vibrated almost to the top of the form work. The hydraulic jacking system shall provide for the simultaneous movement of all the jacks in small pre-calculated increments of 25 mm in 10 to 15 minutes giving a sliding rate of 100 to 150 mm per hour average of continuous slip forming.
The contractor shall make every effort to maintain this rate of sliding. Concrete shall generally be placed in equal horizontal bonds of not more than 250 mm and not less than 100 mm in depth. The slide operation in case shall be so fast as to cause ‘blowouts’ of soft concrete falling out from under the form nor so slow as to cause lifting of concrete or concrete sticking to forms. The sliding operation must be carried out under careful experienced supervision.

Precision instrument to check eccentricity of pier on either direction is to be used at every 3m interval of height or every set of concreting whichever is less. The contractor shall render all assistance to the Engineer for checking level of the

working platform involving verticality of the structure and in adjusting the form that is out of plumb as directed.

The contractor shall provide adequate no. of proper access tower with mechanized passenger hoist arrangement of approved design for the access of personnel to the working decks. The erection and dismantling of the access tower shall also be done by the contractor. The contractor shall also provide for adequate lighting arrangement for night working. The rate quoted by the contractor for continuous slip form concreting shall be deemed to include all costs pertaining to the item stated above.

CHAPTER – IX
SPECIAL CONDITIONS
&
SPECIAL SPECIFICATIONS FOR
TRACK LINKING

SPECIAL SPECIFICATIONS FOR TRACK WORKS

1.0 **GENERAL**

1.1 These specifications shall apply to all such works as are required to be executed under the contract or otherwise directed by the Engineer. In every case the work shall be carried out to the satisfaction of the Engineer and shall conform to the location, lines, grades and cross sections shown on the drawings or as indicated by the Engineer. The quality of the work and the materials shall comply with the requirements set forth in the succeeding sections. Where the drawings and specifications, describe a portion of the work in only general terms and not in complete details, it shall be understood that only the best general practice is to prevail, materials and workmanship of the best quality are to be employed and that the instructions of the Engineer are to be fully complied with and shall be binding on the contractor. The contractor shall be fully responsible to ensure that the finished works are free from any defects, weakness cracks etc.

1.2 CODES OF PRACTICE AND SPECIFICATION :

1.2.1 The abbreviations mentioned else wherefor standard specifications and codes of practice shall be considered to have the following meanings.

IS : Indian Standard of the Indian Standards Institution.
IRS : Indian Railway Standard specifications and codes of practices.
GCC : N.F.Railway General Conditions of Contract & standard special conditions of contract –1998.
IRC : Indian Roads Congress.
RDSO : Research, Design and Standards Organisation (Ministry of Railways).
IRPWM : Indian Railways Permanent Way Manual.
MBC : Monoblock Prestressed Concrete Sleeper.

1.2.2 Wherever the term Engineer comes in these specification it shall be read as defined in clause 1.2 of “Special Conditions”.

1.2.3 Wherever a reference is made to any of the standard specifications and codes or practice, it shall be taken as a reference to the latest version/revision of the same and shall include all the ERRATA/Corrections made in the same from time to time.

1.2.4 In case of any contradiction between provisions in the special specifications laid down here and in the specifications and codes which have been referred to, the former shall prevail and that in all cases the decision of the Engineer shall be final and blinding on the contractor.

1.3 All measurements shall be made in the metric system. Different items of work shall be measured in accordance with the procedures set forth in the relevant sections read in conjunction with G.C.C.

1.4 All matters and specifications not expressly provided for or specified in the tender documents for this work; shall be in accordance with N.F.Railway General Conditions of Contract and Standard Specifications, 1998 edition, corrected up-to-date and the contractor shall be found by them for the performance of the contract.

1.5 The chainages mentioned in the tender documents are field chainages. The chainages are meant for guidance only. For the purpose of payment, actual lengths will be measured on ground.

1.6 All P.Way works shall be executed as per the procedures. “Guidelines and Practices laid down in the Indian Railway Permanent Way Manual published by the Railway Board”, the booklet on "Quality Control in Track Linking" published by the Indian Railway Institute of Civil Engineering, Pune and/or laid down in any other related documents as directed by Engineer or his authorised representative. Turnouts shall be laid in accordance with RDSO’s drawings for layout of turnouts.

2.0 **TRACK LINKING WORKS**

2.1 **General**

2.1.1 **Track Structure**: Track structure shall be as specified in the Schedule of Rates and Bill of Quantities.

2.1.2 **Supply of Materials**

All track materials required for the work; which are to form part of the final track shall be supplied by the BBJ at locations as specified in the schedule of Rates and Bill of Quantities. All other consumables, tools, plants and equipment's required for execution of work shall be supplied by Contractor free of cost for the successful completion of the work; until and unless specified otherwise.

2.1.3 **PREPARATION OF MATERIALS FOR USE**

2.1.3. **CST-9 SLEEPERS**

1

(a) Coat of coaltar on Tie bars, Cotters and Two way keys shall be given preferably in Depot before assembly to avoid rusting etc. No separate payment shall be admissible for this work.

(b) CST-9 sleepers shall be assembled at site to avoid possibility of bending of Tie bar.

(c) In each rail 5th, 10th & 15th sleeper shall be reverse jaw type (on track other than LWR) or as directed by the Engineer. Sleepers to be spread /placed accordingly.

2.1.3. **Monoblock Prestressed Concrete Sleepers**

2

(a) Concrete sleepers shall be handled with utmost care and precautions so as to avoid any damage to the sleeper while unloading/handling/placing etc.

(b) Extent instructions with regard to location of use of different categories of MBC sleepers shall be strictly adhered while placing/spreading/laying pre-stressed concrete sleepers.

2.1.3. **RAILS**

3

(a) No rail smaller then 6 m shall be used in track except on points and crossings.

(b) Kinks in rails if any shall be removed by Jim Crowing. Cutting and drilling holes in rail ends shall be done as required for eliminating hogged rail ends. Track linking at Bridge approaches, Level crossing approaches and Points & Crossings shall also be done as directed by the Engineer.

(c) On curves, contractor shall be required to cut the rail and drill holes as directed by the Engineer to ensure square joints.

(d) Cutting of the rails shall be done only with hacksaw blade or by abrasive disc cutter.

(e) On either end of 3 rail panels, rail will have to be drilled to provide holes for the fishplated joints if not already drilled. Payment for drilling holes shall be governed as per the provisions in the Bill of Quantities and Schedule of Rates

(f) Fish Bolt holes shall be drilled correctly by using Template. Template made of half length of new fish plate with the lips cut off to make it light shall be used. Sleeve Punch shall be used for making the holecentres on webs.

(g) Fish Bolt holes shall be drilled correctly by using Template. Template made of half length of new fish plate with the lips cut off to make it light shall be used. Sleeve Punch shall be used for making the holecentres on webs.

(h) Chamfering of bolts holes shall be done using chamfering tools.

2.1.3. **FITTINGS**

4

(a) Fish plates shall be cleaned & greased before putting into track.

(b) Oiling of fish bolts shall be done before using.

(c) Elastic Rail Clips wherever used shall be driven only after greasing to prevent rust

binding with inserts/bearing plates.

3.0 **SLEEPER SPACING**

3.1 Sleeper spacing shall be correctly marked on the web of rail by paint mark, sleeper spacing scale made of wooden batten shall be used for marking sleepers spacing on web of rails.

3.2 On curves sleepers spacing shall be marked on outside rail. On curves sleepers shall be radial and on straight it shall be square. Sleeper spacing shall be transferred on other rail by using T-square. Sleeper shall be square before driving keys/fixing Elastic Rail Clips.

4.0 **COTTER DRIVING (if CST-9 Sleepers are to be used)**

4.1 Driving of cotters shall be done correctly as shown in Indian Railway Track Manual.

4.2 Splitting of cotters shall be done using cotter splitting device made of scrap Tie Bar or by using cotter splitting machine.

4.3 Method of splitting shall be as indicated in sketch No.CE/CON/SK/25/95.

4.4 Tappered side of cotter shall be in contact with slopped face of CST-9 plates.

5.0 **DRIVING OF KEYS / ELASTIC RAIL CLIPS.**

5.1 For direction of driving keys instructions as given on sketch No.CE/CON/SK/24/ 95 shall be followed.

5.2 Elastic Rail Clips shall be driven correctly so that the ends of the leg of ERC going into the insert becomes flush with the insert face. Over driving results in excessive toe load which may lead to early breaking of ERC due to fatigue. Under driving results in reduced toe load.

6.0 **EXPANSION GAP AT FISH PLATED RAIL JOINTS**

6.1 Expansion liner of correct thickness shall be used to ensure proper gap. Liner shall not be removed till track is brought to final shape.

6.2 Rail thermometer shall be used, so that correct gap can be ensured at the time of initial laying of track (final driving of keys).

6.3 Gap shall be kept as mentioned below, depending on rail temperatures.
(tm – mean rail temp. tm varies between 32^0 & 33^0 for area covered by N.F.Railway)

SN	TEMPERATURE RANGE	TEMPERATURE (For areas with tm = 320)	TEMPERATURE (For areas with tm = 33 0)	GAP TO BE PROVIDED AT THE TIME OF LAYING
1.	tm + 2.6 to tm + 7.5	34.60 c to 39.50 c	35.60 c to 40.50 c	2 mm
2.	tm + 2.5 to tm – 2.4	34.50 c to 29.60 c	35.50c to 30.60 c	4 mm
3.	tm – 2.5 to tm – 7.5	29.50 c to 24.50c	30.50 c to 25.50 c	6 mm
4.	tm – 7.6 to tm – 12.5	24.40 c to 19.50 c	25.40c to 20.50c	8 mm
5.	tm – 12.6 to tm – 17.5	19.40 c to 14.50 c	20.40 c to 15.50 c	10 mm
6.	tm – 17.6 to tm – 22.5	14.40 c to 9.50 c	15.40c to 10.50 c	12 mm

Mean rail temperature shall be decided based on the location of work. Decision of Engineer shall be final in this regard.

6.4 Liners of different thickness, as directed by the Engineer shall be arranged by the Contractor at his own cost to provide correct expansion gap at rail joints according to the temperature at the time of linking prior to joining the rail with fish plates, the fishing

planes of fish plates and rail ends to be thoroughly cleaned with wire brush and one coat of grease graphite mixture shall be applied at clean fishing planes of fish plates and rails ends and then fish bolts after oiling with black oil shall bed put and tightened. Grease graphite, black oil and rail thermometer shall be arranged by the contractor.

6.5 Each fish plated joint shall have four fish bolts and nuts fully and completely tightened with the help of standard spanner.

7.0 **BALLASTING**

7.1 Broken stone ballast of 50 mm size specified shall be obtained in stacks along the alignment and in yard or will be unloaded from wagons which will be handed over to the contractor for spreading. In case of spreading on new alignment the ballast shall be spread on the finished formation and it has to be compacted by hand roller or vibratory compactor.

7.2 The complete quantity of ballast provided in stacks shall have to be put in the track and spread uniformly and payment for the item carrying and spreading of the broken stone ballast shall be made for the stack quantity as was measured and accepted earlier.

7.3 The work of carrying and spreading of broken stone ballast from stacks shall include lead as indicated in Schedule of rates. It shall be inclusive of all lifts, descents, crossing of track and road, nullah or any other obstruction etc. complete with contractor's own labour, tools and equipment.

7.4 Once measured ballast stack are handed over to the contractor, he shall be responsible for the safe custody of the same and putting it in track as directed by the Engineer. In case of theft of ballast, cost of total; quantity in stack shall be recovered from Contractor at rates as worked out as per provision of Standard Special Conditions of Contract.

7.5 Dressing of formation shall be done before ballasting.

7.6 Center line pegs at every 50 m interval on straight and at 25 m interval on curves shall be provided, in addition at followings locations :

7.6.1 The beginning and end of transitions.

7.6.2 Approach of bridges and level crossings.

7.7 Initial 150 mm layer of ballast shall be spread after giving centre line pegs in case of ballasting on new formation.

7.8 While picking up ballast from stacks, it is to be ensured that dust etc.is not picked up and put on the formation/track. It shall also be ensured that no ballast is left at the stacking ground. Ballast shall be picked up by using Contractor's own wire basked and rake ballast.

8.0 **TRACK LINKING ON NEW ALIGNMENT**

8.1 Before the work is started, the contractor shall arrange to clear the formation top of all vegetations, shrubs and make formation with 1:30 cross slope etc. at his own cost to facilitate the set out of the centre line of the track as well as marking of formation level with pegs. The contractor shall arrange to supply at his own expense suitable pegs as directed by the Engineer.

8.2 According to the level, marked on pegs as per the alignment set out on the formation, contractor shall arrange levelling and dressing of the formation top. The levelling and dressing may require cut and fill up to an extent of 150 mm average depth including all leads and lifts from; within the Railway land as directed by the Engineer at Contractor's own cost. Excavation more than 150 mm will be paid separately under NFSR/1993 items.

8.3 Sleepers shall be spread for linking after spreading and compacting by hand roller or vibratory compactor ballast to a minimum thickness of 150 mm in a manner to finally suit the standard ballast profile. After linking and initial packing the balance quantity of ballast will be put in the track for lifting of track in stages to final level and subsequent rounds of the through packing.

8.4 The intermediate sleepers shall be spread to suit the density of sleepers.

8.5 3 rail panels or longer welded panel available at work; site shall be put in the track in position by hauling to required extant if necessary by the Contractor at his own cost.

The contractor may be asked to put into the track free rail (13 metre long approx.) also and provide fish plates with clamps, so that the welding can be done later on. He will have no claim on this account. As per spacing of sleepers one rail of each pair shall be paint marked as directed by the Engineer. The rail shall then be placed on sleepers, already spread as per para 8.3 accordingly the intermediate sleepers shall be positioned as per paint mark on the rail, duly squared. The two way keys/Elastic Rail Clips shall then be driven. For driving two way keys/ERC only approved hammer shall be used.

9.0 **LAYING/LINKING OF TRACK ON OLD ALIGNMENT**

9.1 The renewal works are to be carried out as per Chapter-III of IRPWM, 1986 edition with all up to date corrections.

9.2 Log Book shall be maintained at the site showing date-wise progress of works against various items and will be jointly signed by the Contractor and Engineer-in-charge works.

9.3 Desired super-elevation has to be achieved at the time of execution of initial packing, through packing and lifting operation on curves including transition portion.

9.4 The entire work; is to be carried out under the personal supervision of the concerning person of BBJ/ SE/JE (Works/Way).

9.5 Before commencement of work, BBJ along with the contractor who has been awarded with the said work shall carry out foot by foot survey for the length to be dismantled/ handed over and satisfy themselves to the correctness of details of materials likely to be released after dismantling. Details of material to be released after dismantling have to be listed out in a register and both BBJ and contractor shall sign the register in token of their acceptance of materials likely to be released. The contractor ; has to return the released materials in accordance to the details recorded in the register, and shall be responsible for any shortage.

9.6 All released material shall be carried to locations as indicated in Bill of Quantities and Schedule of Rates and stacked properly at locations as directed by Engineer including in godowns, if required, including all leads, lifts, descents, crossing the track, nullah, drain, platform and other obstructions with contractor's own labour, tools and equipment all complete.

9.7 Against items meant for only dismantling of track, 20% payment will be made after completing the dismantling work and 80% payment will be made after carrying and stacking the released materials at nominated stacking areas as per Schedule of Rates and Bill of Quantities.

9.8 Against CTR/TSR items which involve dismantling along with other track works like insertion of sleepers, deep screening etc. 70% payment will be made after completing the track work and 30% payment will be made after carrying and stacking the released materials at nominated stacking areas as per Schedule of Rates and Bill of Quantities.

9.9 Contractor shall take all steps required as per instructions of Engineer to relax the speed restrictions at the earliest possible date. In case of failure of the contractor to take necessary steps as per direction of the Engineer in this regard, the Engineer shall be at liberty to stop further works till it is possible to relax the speed restriction in the affected length to his satisfaction. The contractor shall be responsible for any delay in completion of works on this account.

10.0 **THROUGH PACKING**

10.1 All through packing works shall be carried out in accordance with provisions of para-224 of IRPWM of 1986 edition with all upto date corrections and the rate shall include the cost of following main activities and also picking up of slacks between successive through packing. (No separate payment will be made for picking up of slacks between successive rounds of through packing).

(i) Opening of road
(ii) Examination of rail, sleepers and fastenings.
(iii) Squaring of sleepers.
(iv) Slewing of track to correct alignment.

(v) Gauging.
(vi) Packing of sleepers.
(vii) Re-packing of joint sleepers.
(viii) Boxing of ballast section and tidying.

Realignment of curve on new linked/TSR/CTR track or slewed existing track and slewing of newly linked track/TSR/CTR track if required has to be done by Contractor at his own cost, no separate payment shall be made and rate is inclusive of same.

10.2 Through packing is to be done before opening of line for traffic as per instruction of Engineer-in-charge or his authorised representative. After opening of line for traffic picking up of slacks on rundown stretches is to be done by Contractor for which no separate payment shall be made.

11.0 **LIFTING OF TRACK**

11.1 Lifting of track will be done in accordance with provision of para–233 of IRPWM, 1986 edition with all up to date corrections.

11.2 Adequate time lag shall have to be allowed after the lifting of track before through packing starts so that sufficient consolidation of track takes place in between.

12.0 **ASSEMBLING POINTS & CROSSINGS AND DERAILING SWITCHES**

12.1 The sleepers as per prescribed drawing and as directed by the Engineer shall be spread accurately. Switches, crossing body, lead rail and check rails shall then be placed on sleeper at fairly correct position. Switch portion of points and crossing shall first be linked. Then after fixing check rails with running rails by mean of distance blocks and bolts of correct length straight track including crossing body shall be linked correctly. Then the turnout side track of points and crossing after aligning following the off sets prescribed in Track Manual and RDSO's assembly drawing of latest edition, shall be linked properly.

12.2 The stock rail on the turnout side ahead of the actual toe of switch shall be given a bend with Jim crow, if required, as per the direction of Engineer-in-charge at site.

12.3 The cutting of rails that may be required on the lead portion shall be done in a plane normal to the rail length with hacksaw. The use of chisel, hammer and Jim crow shall not be allowed.

12.4 The fastenings like ERCs, Metal liners, GFN liners shall not be forced with a hammer. The standard ERC fixer and remover shall have to be used.

12.5 The stock rails, switch rails etc. issued for the work shall be handled with care so that no distortion is introduced. Bends/distortion existing before the issue of the materials or developed after the issue shall be straightened as required.

12.6 The switches shall be lubricated with Contractor's own lubricants of approved quality after assembling as directed by the Engineer.

125.7 Spring lever along with pull rod if required shall be so fixed to ensure proper setting of points as per Schedule of Dimensions (for BG) of latest edition. No separate payment shall be made for fixing spring lever as rate of linking is inclusive of the same.

13.0 **LINKING OF TRACK AT LEVEL CROSSING**

13.1 Track at level crossing shall be linked on special PSC sleepers with fittings as per RDSO's drawings with the check rail fixed to the sleeper with fittings as per RDSO drawing as directed by the Engineer. The general arrangement and details fixture shall be as per approved drawings. The check rail shall have to be cut to facilitate the fixing of the C.I. brackets.

13.2 All fittings and portion of rails to be used at Level Crossing shall be provided with two coats of coal-tar as directed by the Engineer at Contractor's own cost. The approved quality of coal-tar will be arranged by the Contractor at his own cost and it shall be passed by BBJ before use.

13.3 The ends of check rails shall be bent to shape indicated in the drawing.

13.4 Squaring of sleepers shall be ensured before tightening the fittings. After the track along with the check rails have been assembled at a level crossing, the Contractor

shall arrange to place CC blocks parallel to and abutting the running rails supported on the shoulder of the line sleepers as shown in the general arrangement plan. CC blocks shall also be fixed in between the two running rails over the levelled ballast layer and each end of the check rails. The CC blocks shall be placed abutting the bent portion of the check rail end. The empty space between the check rail and CC blocks is to be filled up with Railway ballast and ramped uniformly. The payment for the CC blocks will paid under relevant item of NFSR, 1993 at the rate quoted in the tender.

13.5 The linking of track on level crossing shall be done following the stipulations made in para 921 of IRPWM of 1986 edition with all up-to-date corrections. The length of check rail shall be decided following specifications as per Annexure-IX/I of IRPWM, 1986 edition. The flange way depth/clearance is to be provided as per provisions made in the "Schedule of Dimensions", of Railway.

14.0 **LINKING OF TRACKS ON GIRDER BRIDGES**

14.1 Linking of track over girder bridges shall be done in accordance to para 273, 274 & 275 of IRPWM, corrected up-to-date. Bridge sleepers to be fixed with girder by hook bolts. Notching of bridge timber to be done.

(i) To maintain equal depth of sleeper.

(ii) To house the rivet heads and any extra plate etc.

14.2 Steel channel sleepers/H beam sleepers are to be used on girder bridges with fittings as per RDSO's standard drawings.

14.3 Guard rails to be given bend and wooden binders to be fixed on both ends of guard rails as directed by the Engineer.

14.4 Chequered plate shall be fixed on the bridge sleepers by drilling holes in chequered plate and fitting with bolts etc. to avoid pilferage of chequered plates as directed by the Engineer.

14.5 Angle ties shall be fixed on bridge sleepers to avoid bunching of bridge sleepers.

14.6 Outside guard rails shall be fixed at Bridge approaches on special PSC sleepers with fittings in accordance to standard drawings

14.7 Outside guard rails shall be fixed at Bridge approaches on special PSC sleepers with fittings in accordance to standard drawings.

15.0 **SAFETY PRECAUTIONS FOR TRACK WORK**

15.1 The contractor shall not start any work on the open line track without the presence of the BBJ's supervisor at site. In case the contractor or his representative starts any work in absence of the supervisor, it shall be treated as unauthorised and illegal tampering with the track and shall be liable for action under the BBJs Act.

15.2 Wherever works are required to be done under Traffic Block in terms of IRPWM or General & Subsidiary Rules for working of Trains, the same shall be arranged by Engineer's authorised representative. Works shall not be started until and unless the Traffic Block is confirmed.

15.3 Required track protection as per work involved, with banner flags/hand flags and caution Boards shall be arranged by the contractor before taking up works requiring such protection as per IRPWM Chapter-VIII.

15.4 The BBJ administration reserves the right to terminate the contract with immediate effect if the contractor is found responsible for any breach of rule which affects the safe running of trains without giving any further notice/notices to the contractor.

15.5 The contractor shall arrange for "Lookout man" in addition to BBJ's arrangements for protection to warn the contractor's labourers of any approaching train, where such arrangements are considered inadequate by the Engineer or his representative, contractor shall augment the arrangements as instructed. Engineer's decision would be final and binding in this regard. No compensation will be paid by BBJ in case of injury or death to contractor's labour and the contractor shall indemnify the BBJs of any responsibility in this regard. The contractor may obtain Group Insurance in respect of his workmen/workwomen.

15.6 No compensation shall be payable to the contractor if the work cannot be done due to non-availability of traffic blocks, rains or any other reason whatsoever. The contractor shall take into account the probability of labourutilisation depending on the above factors on the section where the work is to be done and quote his rate accordingly.

15.7 In case of loading/unloading/leading/handling P. Way materials such as rails/sleepers etc. same rate would be deemed to be applicable for New/Old materials. No weightage would be given for reduction in weight due to wear/corrosion etc. and the nominal weight as per drawing would alone be considered as final and binding.

CHAPTER – X
SPECIAL SPECIFICATION FOR
STEEL FABRICATION WORK

SPECIAL SPECIFICATION FOR STEEL FABRICATION WORK

1.0 GENERAL

1.1 These specification shall apply to all such works as are required to be executed under the contract or otherwise directed by the Engineer. In every case the work shall be carried out to the satisfaction of the Engineer and shall conform to the location lines, grades and cross sections shown on the drawings or as indicated by the Engineer. The quality of the work and the materials shall comply with the requirement set forth in the succeeding sections. Where the drawings and specifications described a portion of the work in only general term and not in complete details, it shall be understood that only the best quality are to be employed and the instruction of the engineer are to be fully complied with and shall be binding on the contractor, The contractor shall be fully responsible to ensure that the finished work are free from any defects, weakness, cracks etc.

1.2 All matters and Specifications not expressly provided for as specified in the tender documents for this work shall be in accordance with N.F.Railway, General Conditions of Contract-1998 and Standard Specification –1993 edition corrected up to date and the contractor shall be bound by them for the due performance of the contract.

2.0 CEMENT CONCRETE WORK.

2.1 The rates of concrete works should be deemed to include all charges for testing of materials and concrete cubes required to be done in accordance with the specifications. The contractor should prepare at his own cost a set of standard cubes of concrete for every 45 cum of concreting under the supervision of Engineer or his representative and submit the same to BBJs for testing. Testing will be arranged by the contractor(s) in consultation with the Engineer and the charge for the same shall be fully borne by the contractor.

Cement consumed for making such cubes will be accounted for separately in addition to the quantity required for actual execution of work and the cost for this cement for cubes will be recovered at the prevalent normal rates.

2.2 Weep wholes should provided in abutments, face, straight/wing and return walls of RCC boxes, Hume pipe and R.C.C. slab bridges as per the drawings. No extra payment will be admissible for this. It is, however, specified that no deductions from the quantities of cement concrete will be made on this account. In case of R.C.C. boxes straight/wing and return wall 75mm dia A.C. pipe should be used for weep holes.

2.3 All concrete and R.C.C. should be vibrated properly so as to achieve high concrete density. No work should be carried out without proper vibration. Over vibration leading to segregation of concrete should not be done.

2.4 The concrete strength of different nominal mixes in the relevant items should conform to the strength specified in this IRS codes .Wherever this is not available in IRS codes, strength specified in ISI & IRC codes shall be applicable according to the case.

2.5 Aggregate for concrete works :

2.5.1 The following materials should be used for cast-in-situ as well as pre-cast cement concrete works.

(a) RCC works - Coarse aggregate of broken hard stone of approved quality of size 6mm to 20mm for slabs, boxes, walls etc. or approved by the Engineer.

(b) For plain concrete of mix of 1:2:4 broken hard stone chips of approved quality of size 6 mm to 20 mm or as approved by the Engineer.

(c) For all plain concrete works of mix 1:3:6/1:4:8 graded hard screen shingles of size from 13 mm to 40 mm as approved by the Engineer. However, use of broken approved quality aggregate up to 40 mm size is as per option of contractor without any claim for payment over screened shingle rate.

2.6 Reinforced and plain cement concrete work is to be carried out as per the relevant provisions made under CONCRETE in Chapter III (D) of Standard Specification, - 1993 edition, N. F. Railway.

2.7 CONTROLLED CONCRETE

2.7.1 Design of mix shall be carried out by the contractor in his own laboratory in presence of the Engineer or his representative. When mix has been approved, no variation shall be made in the proportion, source of cement and aggregates or in the type, size and grading of the later and water cement ratio.

2.7.2 The concrete mix shall be so designed as to attain in preliminary tests a strength of at least 35% higher than the required or work tests.

2.7.3 The proportion of the in-gradients shall be taken by weight, water shall either be, measured by volume in calibrated buckets of weighted to maintain specified water cement ratio content.

2.7.4 Mixing, transportation, placing, compaction and curing shall be done as approved by the Engineer of his representative.

3.0 LINKING OF TRACKS OVER GIRDER TYPE BRIDGES.

3.1 TRACK LINKING :

3.1.1 For linking of Track on girders the provisions in the IRPWM-1986, IRICEN publication on quality control in the track linking, track circulars issued by CE/NF Railway shall be followed.

3.1.2 Design of guard rails shall be as per para 275 (ii) of IRPWM,1986. The end of the guard rails should be bent vertically and buried and a piece of timber fixed on the end to prevent entanglement of hanging loose couplings.

3.1.3 Linking of track on girders shall be on Steel channel sleepers/H beam sleepers as per RDSO's Drg. No. B-1636 and the instructions/notes laid therein . Steel channel sleeper/H beam sleepers shall be laid at a spacing of 740mm centre to centre for BG and 530mm centre to centre for MG.

3.1.4 The steel channel sleepers/H beam sleepers shall be fastened to the girders with the hook bolts and nuts duly connected with ISA:75X75X8mm angle runners through the hook bolts for the entire length of the girders as per RDSO"s Drg.No. B-1636/A for seating arrangement for riveted plate girder/stringers. Angle runners are to be arranged and fixed by Contractor within their scope of work.

3.1.5 Rails and guard rails shall be fastened to sleeper as per RDSO"s Drg.No.RDSO/T-5454 and T/5455 - 4562 for rail fastening arrangement on girder bridges with Steel channel sleepers/H beam sleepers.

3.1.6 For snap head rivet girders MS groove pad plate of appropriate thickness shall be used between channel sleepers and the top flange of girder for clearing the rivet heads, curtailment of flange plate and adjustment of cross level.

3.1.7 Elastomeric pads shall be joined with the MS plate using polychloroprene based self curing adhesive such a Dunlop B-708 of M/s. Dunlop India Ltd. or RLIO Bond of M/s. Goodyear India Ltd.or DENDRITE P0-A5 of M/s. Chandras Chemical Enterprise Pvt. Ltd., or Fevicol SB-97 of M/s. Nabula Chemical Pvt. Ltd. or similar type . Surface of the elastomeric pad to be bonded shall be cleared by gently rubbing with fine emery cloth for the purpose of removing any superficial layers or extraneous matters such as wax. Care shall be exercised during rubbing so that the surface of the rubber pad is not damaged. The surface of the MS plate to which the elastomeric pad is to be bonded shall be cleaned free from dirt, oil, grease, rust, mild scale or any other extraneous matters. The adhesive shall be applied in thin layers uniformly spread both on the surface of the elastomeric pad and MS plate to be bonded. After application of adhesive 10 to 15 minutes shall be allowed before jointing the two surfaceso as to allow solvent to evaporate. The elastomeric pad shall be joined in position with the MS plate and wherever practicable roller pressure shall be applied from one end so as to avoid air entrapment/gap.

3.2 **GALVANIZING**: Hot dip galvanizing of iron and steel articles is to be done as per IS:2629 “Recommended Practice for Hot Dip Galvanizing of iron & steel” and as per RDSO’s specification May/2004.

3.3 Threads of hook bolts and rails / sleepers fastening bolt should be oiled with black oil.

4.0 FABRICATION OF STEEL GIRDERS :

4.1 The abbreviations mentioned elsewhere for standard specifications and code of practice shall be considered to have the following meanings :

IRS	:	Indian Railway Standard Specifications and Code of Practice.
IS	:	Indian Standard of the Indian Standards Institution.
GCC	:	N.F. Rly. General Conditions of Contract and Standard Spl. Conditions of Contract, 1998.
RDSO	:	Research, Design and Standards Organisation (Ministry of Railways).

4.1.1 Wherever the terms Engineer-in-charge appears in the above specifications shall be read as "Engineer" and shall have the meaning as defined in the G.C.C. Similarly the work Deptt. shall mean "BBJ" as defined in the G.C.C.

4.1.2 In the event of any provision not being covered by IRS specification and BBJ specifications, reference may be made to the relevant IS, BS and ASTM specifications in that order. Wherever these are silent, the fabrication shall conform to sound engineering practices and in case of any dispute arising out of the interpretation of the above, decision of the Engineer shall be final and binding on the contractor.

4.1.3 Wherever a reference made to any of the standard specification and code of practice under clause shall be taken as a reference to the latest version/revision of the same and shall include all the errata/corrections made in the same from time to time.

4.1.4 In case of any contradiction between provision in the specification laid down here and in the IRS specifications and codes which have been referred to, the former shall prevail and that in all cases the decision of the Engineer shall be final and binding on the contractor.

4.1.5 All measurements shall be made in the metric system and English language. Different items of work shall be measured in accordance with the procedures set forth in the relevant sections read in conjunction with the G.C.C. and Special Conditions of the Contract. All the measurements and computations unless otherwise indicated shall be carried nearest to the following limit.

(i)	Length and breadth	:	0.01 m
(ii)	Height, depth or thickness of structural members	:	0.005 m
(iii)	Area	:	0.01 Sqm.
(iv)	Weight	:	0.001 MT.

4.2 TEMPLATES/JIGS & FIXTURES :

The contractor shall make his own arrangements at own cost for the Templates Jigs & Fixtures as may be required. No steel in this connection will be supplied by the BBJs. The templates used through out the work shall be of steel of similar category as for the member and of tested quality.

4.3 TEST CERTIFICATES :

4.3.1 All materials for the work should pass test or /and analysis prescribed by the specifications mentioned above and as laid down in the succeeding paragraphs or to such other recommended specifications as the BBJ shall have authorised as equivalent thereto or in absence of such authorised specifications such tests and analysis as BBJ shall specify.

4.3.2 All raw materials shall be obtained from recognised producers or their authorized representatives and the contractor shall submit Test Certificates for the materials so obtained to the satisfaction of the BBJ.

4.3.3 Any approval given by the BBJ in consequence of such tests or analysis shall in no

way limit or interfere with the absolute right of the BBJ to reject the whole or portion of such materials supplied, which in the judgement of the BBJ do not comply with the conditions of contract. The decision of the BBJ in this regard shall be final and conclusive for all purpose.

4.4 CODES & SPECIFICATIONS :

The materials and workmanship shall be to the following specification and code of practice (latest versions of specifications/code of practice to be used).

(i)	IRS 1972	:	Indian Railway Standard Welded Bridge Code.
(ii)	IRS(B1–2001)	:	Specification for steel girder bridges.
(iii)	IS:2062-1992	:	Specification for wieldable structural steel (Grade-B)
iv)	IS:9595-1980	:	Recommendation for metal ARC welding of carbon and carbon manganese steel.
(v)	IS:75-1973	:	Specification for linseed oil, raw and refined.
(vi)	IS:77-1976	:	Specification for linseed oil, boiled, for paints.
(vii)	IS:102-1962	:	Specification for ready mixed paint, brushing, red lead, non-setting priming.
(viii)	IS:133-1961	:	For fabrication & erection of steel structures (new girder bridges)
(ix)	IS:814-1974 & IS	:	816-1969 covers welding code.
(x)	IS:814	:	Electrodes for metal ARC welding of structural steel.
(xi)	IS:1149-1982	:	High Tensile steel rivet bars for structural purposes.

4.5 **FABRICATION :**

4.5.1 CUTTING :

4.5.1.1 Except where otherwise indicated all plates and sections shall be cut by mechanically controlled torch both in case of mild steel and high tensile steel work. Provided the edge as given by the torch reasonably clean and straight, plates may be cut to shape and channel and other sections cut to length with a gas cutting torch preferably coal gas or hydrogen should be used.

4.5.1.2 All flame cut edges shall be ground to obtain reasonably clean square and true edges. Drag lines produced by flame cut should be removed.

4.5.2 DRILLING : All holes shall be drilled, but the Contractor may, if he so prefers, sub-punch them to a diameter 6 mm less than that of the finished holes, e.g. a punch hole which is to be drilled out to 25 mm in diameter shall not exceed 19 mm in diameter at the die end. When the rivet holes are to be sub-punched they shall be marked off with a centre punched and made with the nipple punch or preferably shall be punched in a machine in which the position of the holes automatically regulated. The punching shall be so accurate that when the work has been put together before drilling, a gauge 1.5 mm less in diameter than the size of the punched holes can be passed easily through all the holes.

4.5.3 WELDING :

4.5.3.1 All welding work shall be carried out in accordance with the provisions of INDIAN RAILWAY STANDARD WELDED BRIDGE CODE 1972.

4.5.3.2 No welding operator shall be employed on the work until he has in the presence of the Engineer/Inspecting Officer (I.O.) pass the appropriate tests laid down in the relevant specifications. Routine re-testing of the welded operators may be required every six months if deemed necessary by the Engineer/I.0.

4.5.3.3 The General welding procedure for each type of weld shall be submitted in writing to the Engineer/I.O. for approval before the work is taken up. Where required by the Engineer/I.O., the welding trial shall be carried out on representative samples of materials to be used in the work.

4.5.3.4 The welding procedure shall be approved by the Engineer/I.O. based on the welding procedure trial. Approval of the welding procedure shall not relieve the Contractor of his responsibilities for correct welding and minimising distortion of the finished structure. No deviation from the approved welding procedure shall be made without the prior approval of the Engineer/I.O.

4.5.3.5 All tack welds shall be of the same quality and size as the first run of the main weld shall fuse completely with the ends of the tack welds to form a regular profile.

4.5.3.6 The position of welds required for temporary attachment shall be approved by the Engineer/I.O. before the work starts. The temporary attachments shall be removed without damage to the parent metal, which shall be finished smooth by grinding.

4.5.3.7 The contractor shall provide all welding consumables at his own cost. Electrodes shall conform to IRS specification M-28. The wire flux combination for submerged ARC welding shall conform to IRS specification M-39. The welding consumable shall be procured from supplier borne on RDSO's approved list. Manufacturer's test certificate for each lot of welding consumable shall be submitted to the Engineer for verification.

4.5.3.8 The welds shall be inspected for compliance as per provisions of IRS : Welded Bridge code. Radiographer/ultrasonic testing shall not be required.

4.5.4 RIVETING: Riveting shall be done in accordance with IRS: B1 - 2001.

4.6 PAINTING: No part of the work shall be painted until it has be finally inspected and approved by the Engineer/Inspecting Officer (I.O.)

5.0 **ASSEMBLING ERECTION OF STEEL GIRDERS:**

5.1 **PAINTING OF GIRDERS** The new girders will be having necessary shop coat of paint. The rate for erection of these girder shall include one coat of aluminum paint as per IS-2339-1962 over the shop coat of paint. Paint for work will be supplied by contractor at their own cost and approved by the Engineer prior to application. Surface cleaning and patch up, wherever necessary can be done manually with wire brushes and the application of paint can be done by manually with brushes or by

mechanical means to the satisfaction of the Engineer.

5.2 The erection rate is to include the driving of all site rivets, turned-fitted, HSFG and black bolts, nuts, washers etc. required to complete erection at site of IRS Specification B1-2001 with latest revision. The rivets, HSFG Bolts, Turned – fitted bolts will be supplied by contractor at their own cost. Service bolts, nuts, washers, drifts are also to be arranged by contractor at their own cost.

5.3 Service bolts and nuts, ordinary plate washers and drifts for use in erection shall be provided and used equal to 50% of field rivets/ HSFG Bolts. The rate quoted for erection shall consider that those will remain the property of the contractor after the completion of the work.

5.4 Specifications noted in Indian Railways Standard Specification for erection and riveting of bridge girders serial No. B1-2001 with latest revision should be followed.

5.5 The contractor shall, if and when required by the BBJ pull down, take up or re-do any work or remove from site or separate any bad material, which in the opinion of the Engineer or his representative are defective or unsound, without any extra payment.

5.6 The following Standard Specifications, Rules, Codes of practice, modified up to date, must be followed in regard to materials and workmanship etc. viz.

(i) IRS No. BI-2001 for steel girder bridges with up to date correction.

(ii) IS: 1148-1982- Specification for hot rolled steel rivet bars.

(iii) IS: 1363-1984- Specification for Hexagon head bolts, screws, and nuts of product grade C (Part-I, Part-II and Part-III)

(iv) IS: 2062-1992 for structural steel (Grade B).

(v) IRS Bridge Rules.-1964 reprinted in 1989.

(vi) Schedule of dimension, BG up to date.

(vii) IRS steel bridge code.

(viii) IS: 102-1962 Ready mixed paint red lead.

(ix) IS: 2339-1963 for aluminium paint.

(x) IS: 1829-1982 for hot forged steel rivets, for hot cohesive.

(xi) IRS Concrete Bridge Code - 1999.

5.7 **FIELD RIVETS, BOLTS, NUTS AND SERVICE ACCESSORIES**.

5.7.1 The work includes supply of all rivets, permanent bolts, nuts, washers etc. required to complete erection at site with allowance for waste since, Contractor shall be responsible for supplying site rivets and permanent bolts, nuts and washers of correct length.

5.7.3 Service bolts and nuts, ordinary plates, washers and drifts etc. for use in the erection of the work shall also be arranged by the contractor at his own cost. On completion of the erection work, these would remain the property of the contractor.

5.7 FIELD RIVETS, BOLTS, NUTS AND SERVICE ACCESSORIES.

5.7.1 The work is to include supply of all rivets, bolts nuts washers etc. required to complete erection at site with allowance for waste. The contractor shall be responsible for supplying site rivets of correct length. The length of such rivets shall be verified by snapping a few rivets of each length in the presence of inspecting officer for examining whether the holes have been completely filled in by rivet materials.

5.7.2 No structural steel for the manufacture of rivets, bolts etc. will be supplied by the BBJ and no extra payment will be made to the contractor for supply of bolts, rivets etc.

5.7.3 Service bolts and nuts, ordinary plates, washers and drifts etc. for use in the erection of the work shall also be arranged by the contractor at his own cost. On completion of the erection work, these would remain the property of the contractor.

5.8 **ASSEMBLY AND ERECTION**:

5.8.1 The contractor shall observe sufficient accuracy in the assembling and erection of every part of the work as per erection scheme of BBJ to ensure that all parts fit accurately together on erection.

5.8.2 The contractor shall maintain a master steel tape of approved make for which he has to obtain a certificate of accuracy from the National Test House calibrated under a tension of 1.8 Kg. at 16.70 deg. C.

5.9 **TEMPORARY STRENGTHENING AND ERECTION GADGETS**

5.9.1 The launching arrangement will include not only the supply and fabrication of launching arrangements but also the supply and fixing of temporary strengthening of girder members to take care of erection stresses and strains. Erection stresses must be kept within allowable limit at every stage of erection.

5.9.2 The contractor has to make arrangements at his own cost for the steel for launching arrangement and temporary strengthening of girders, if required. During launching, strengthening will be done by contractor at his own cost. The rate quoted should take into account these aspects.

5.10 **PARTS IN CONTACT**: All steel elements intended to be riveted or bolted together shall be in contact over the whole surface.

5.11 **PAINTING, RIVETS, BOLTS etc.** All rivets, bolts, nuts , washers will have to be thoroughly cleaned and dipped in boiling linseed oil to be arranged by the contractor at his own cost, before using. No extra payment will be made on this account.

5.12 **RIVETS AND RIVETING.**

5.12.1 The dimensions on the drawings refer to the diametres of the rivet holes and their finished rivets. Rivets shall completely fill the hole and shall be machine driven wherever possible by means of pressure or percussion riveters of approved design. The rivets shall be made to relevant specification. The rivets hole shall be 1.5mm (1/16inch) greater than the diameter of the rivets bars used. The clearance i.e. the difference in diameter between the rivets measure under head before being heated and rivet hole shall not less than 0.75mm (1/32 inch). The shanks shall be made of a length sufficient to fill the hole thoroughly and to form the head.

5.12.2 The rivets shall be at the proper heat and in no case shall one tip be hotter than the head. Rivet less than 10mm (3/8 inch) diameter may be driven cold. Flattened rivet heads may be used in certain planes where clearance require them.

5.12.3 Gauge for rivets, dimension and contours shall be provided by the contractor for the use of the inspecting officer.

5.12.4 Before riveting is commenced, all works shall be properly bolted up so that the sections riveted are in close contact through out. Driven rivets when struck sharply on the head with a 110 grams riveting test hammer shall be free from movement and vibrations.

5.12.5 Drifts may be used for drawing light members into position but their use on heavy members should be restricted to securing them in their correct position. In no case shall drifting be allowed to such an extend that holes are distorted. Drifts steel shall be in accordance with relevant IS specification.

5.12.6 All loose and burnt rivets and rivets with cracks, badly formed, eccentric or deficient

heads, shall be cut out and rivets shall also be cut out when required for the examination of work. The actual method of cutting out shall be approved by the Engineer. Re-cupping and caulking shall in no circumstances be resorted to.

5.13 **PAINTING CONTACT SURFACES BEFORE RIVETING/BOLTING :**

5.13.1 All steel work before riveting/bolting shall have the parts which will be in contact painted immediately before assembling on each surface with a heavy coat of red lead and pure raw linseed oil freshly ground and the surface brought into close contact while still wet paints and their ingredients shall comply with the following specification:

IS specification of red lead for paints and jointing purposes.	...	IS:57 - 1965.
IS specification linseed raw and refined	...	IS:75-1965.
IS specification for linseed oil boiled for paints	...	IS: 77-1976
IS specification for ready mixed paints, brushing, red lead non setting priming,	...	IS:102-1962.

The contact paint is to be arranged by contractor at their own cost.

5.13.2 All parts shall be thoroughly cleaned and dried before they are painted, and when so specified all mill scale shall also be removed before painting.

6.1 **TEST CERTIFICATES**

i) All materials for the work should pass tests or an analysis prescribed by the specifications mentioned above or to such other recommended specifications as the BBJ shall have authorised as equivalent thereto or in the absence of such authorised specification such tests and analysis as to BBJ shall specify.

ii) For raw materials like rivets and paints the contractor shall furnish copies of test certificates from the manufacturers, if any testing of materials is required by the BBJ in respect of any other items this shall be arranged for by the BBJ at its cost.

(iii) Any approval given by the BBJ in consequence of such tests or analysis shall in no way limit or interfere with the absolute right of the BBJ to reject the whole or portion of such materials supplied, which in judgement of the BBJ do not comply with the conditions of the contract. The decision of the BBJ in this regard shall be final and conclusive for all purposes.

7.0 METHOD OF MEASUREMENT:

(a) For the purpose of payment, quoted rates apply to the weights of steel work calculated from final working drawing based on the critical weights given in the producers hand book only and using minimum square overall dimensions, no deductions being made for skew cuts, holes, or notches. Each gussets shall be on the dimension of the smallest enclosing rectangle; additional weight due to welding/rivets and bolts/nuts will not be considered for payment.

(b) The Drawing Office Despatch Lists (D.O.D.L.s) when prepared according to the procedure enumerated in para (a) above, are to be submitted by the contractor to the BBJs for approval. Payment towards erection is to be made only on the quantities indicated in the approved D.O.D.L.s, but no additional weight due to welding/rivets and bolts/nuts will be considered for payment.

(c) (i) Payment will be made based on measurement of approved fabricated materials under relevant items.

(ii) Mode of payment will be governed as per clause No.11 of special

specification for steel fabrication work.

(iii) BBJ may provide all assistance in arranging BFR/WAGON for transportation of Girder Component on contractor's specific request. However, BBJ does not guarantee to arrange BFR/Wagon & their movement. Contractor should plan for movement of the girder component mainly by road.

8.0 QUANTITY :

If the tenderer makes use of any estimated quantity which may be given to him in the schedule or drawings or in any other way, he does 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 error or any miscalculations in the said quantity.

9.0 DEVIATION FROM THE SPECIFICATION :

(a) Should the tenderer desire to depart in any respect from the provisions in this special specification, he must specifically bring the matter to notice, in his tender in the form of a covering letter explaining in detailed such departure he proposes to make from the specification. Manufacture's standard specification may be submitted but all discrepancies must be carefully drawn attention to both in the covering letter and in the appendices to be annexed to the specification, showing the deviation.

(b) Should it be considered necessary to alter any details of the design after letting out the contract, such adjustment of contract price shall be made by the Engineer as may be considered suitable and reasonable and such alteration shall be carried out by the tenderer to the entire satisfaction of the Engineer or the Inspecting officer.

10.0 **INSURANCE :**

The contractor shall be responsible for all damages and injury caused by their work or workmen to the persons, animals or things or to the units of other trades and as he shall effects any insurance and make the employee free from all responsibilities in this respect. The insurance must be jointly in the name of the contractor and BBJ. The contractor is liable in respect of claimants any expenses arising out from any such injury to persons or property on aforesaid and also in respect any award of compensation or damage resulting from such claims.

NOTE: BBJ will make any and all payment to the contractor within 30 days from the date of getting corresponding payment from the N.F. RAILWAY. It is the responsibility of the contractor to get the work certified by the N.F. RAILWAY such that the work becomes qualified for payment as per the terms of payment.

CHAPTER-XI

LIABILITY OF CONTRACTOR(S) FOR ANY DAMAGE SUSTAINED BY BBJ

A LIABILITY OF CONTRACTOR(S) FOR ANY DAMAGE SUSTAINED BY BBJ DURING ACCIDENTS ETC. CAUSED DUE TO CONTRACTOR(s) FAILURES, FAULT OR NEGLIGENCE.

1 The work shall be executed by the contractor in a workman like manner to the satisfaction of the Engineer-in-charge. The contractor and his labour shall be guided by the instructions of the Engineer-in-charge. In the event of any accident occurring at the work site and if it is established during the departmental inquiry by the BBJ or by the Statutory inquiry of CRS, that the accident occurred wholly or partly due to any act tantamounting to negligence on the part of the contractor or his labour in not adhering to the instruction of the Engineer-in-charge, the contractor shall render himself liable for damage and also legal prosecution if loss of life is involved.

2 "Whenever the contractor(s) is/are working near the existing open line and he/ they desired to un-manned level crossings for frequent movement of his/ their vehicles, machinery equipment etc., he/they should put in a respect to safety, the cost of which will be borne by the contractor(s) as per rules in force."

CHAPTER-XII

QUALITY CONTROL

QUALITY CONTROL

1 GENERAL

All materials incorporated, all methods adopted and all works performed shall be strictly in accordance with the requirement of these technical specifications. The contractor shall maintain an approved quality assurance programme and have necessary procedure manuals and documentation, various provision in this section are only indicative and not exhaustive.

1.1 Field Laboratory

(i) Scope

The work covers the provision and maintenance of an adequately equipped field laboratory as required for site control on the quality of materials and the works. The lab should be manned, managed & maintained by suitable qualified personnel from the contractor.

(ii) Description

The contractor shall arrange to provide fully furnished and adequately equipped field laboratory. The field laboratory shall preferably be located adjacent to the site office of the Engineer and provided with amenities like water supply, electric supply etc.

The laboratory should have space for the installation of equipment, laboratory tables and cupboards, working space for carrying out various laboratory tests, besides a washbasin and a curing tank for the curing of samples, around 4m x 2m x 1m in size. Wooden/ concrete working platform shall be provided against the walls, with adequate storage/ furniture.

Laboratory Equipment

(iii) The following items of laboratory equipment shall be provided.

	General	
1	Oven-Electrically operated, thermostatically controlled, range up to 200 C sensitivity 1 C	1 No.
2	Platform balance 300kg capacity	1 No.
3	Balance 20kg capacity self-indicating type	1 No.
4	Electronic Balance 5kg capacity accuracy 0.5 gm	2 No.
5	Water-bath electrically operated and thermostatically Controlled with adjustable shovels, sensitivity 1 C.	1 No.
6	Thermometers: Mercury-in-glass thermometer range 0 to 250 C	2 No.
7	Kerosene or gas stove or electric hot plate	1 No.
8	Glass wares, spatulas, wire gauzes, steel scales, as required measuring tape, casseroles, karahis, enameled trays of assorted sizes, pestle-mortar, porcelain dishes, gunny bags, plastic bags, chemicals, digging tools like pickaxes, shovels etc.	1 Set
9	Set of IS sieves with lid and pan : 450mm diameter, 63mm, 53mm, 37.5mm, 26.5mm, 13.2mm, 9.5mm, 6.7mm and 4.75mm size 200mm diameter, 2.36mm, 2.0mm, 1.18mm, 900micron, 600micron, 425micron, 300micron, 150micron and 75micron	1 Set
10	Water testing kit	1 Set
11	First aid box	1 Set
	For cement and cement concrete	
1	Vicat apparatus for testing times	1 No.
2	Slump testing apparatus	4 Set
3	Compression strength testing machine of 100 tonne capacity	1 No.
4	Needle Vibrator	1 No.
5	Concrete cube moulds	12 Nos.

1.2 The contractor shall set up a laboratory at a location approved by Engineer and equip the same with adequate equipment and personnel in order to carry out all required tests and quality control work as per standard specifications and/ or as otherwise directed by Engineer. Internal layout of the laboratory and list of equipment shall be got approved by Engineer in advance. In case same contractor is doing work in more than one package, more number of laboratories may be required to be provided as directed by Engineer.

1.3 The contractor's laboratory should be manned by a qualified quality control Engineer assisted by experienced technicians and the set up should be got approved by Engineer. The contractor shall carry out quality control test on materials and work at the frequency stipulated in sub clauses of this section. In the absence of clear indications about method and/or frequency of tests for any item in different codes/ standards or as given in these specifications, the direction of Engineer shall be followed.

1.4 For satisfying himself about quality of materials and work, quality control tests will also be conducted by Engineer (by himself, his quality control units or any other agencies deemed for client or Engineer), generally at the frequency set forth here in under. Additional tests may also be conducted where, in the opinion of Engineer, need for such test exists.

1.5 The contractor shall provide necessary co-operation and assistance in obtaining samples for test and carrying out field tests as required by Engineer from time to time. This may include provision of labour, attendance, assistance in packing and dispatching and any other assistance considered necessary in connection with tests. Alternatively, it may require inspectors to carry necessary instruments to site and carrying out tests at site. The contractor will arrange for such visits and tests at no extra cost to employer.

1.6 The contractor shall carry out modifications in the procedure of work, if found necessary, as directed by Engineer during inspection. Works falling short of quality shall be rectified or replaced. If necessary by the contractor at his own cost as directed by Engineer.

1.7 The cost of setting up and operating laboratory including building with services, essential supplies like water, electricity, sanitary arrangements and their maintenance and cost of all equipments, tools, materials, labour and incidentals to perform tests and other operations of quality control according to specifications shall be deemed to be incidental to work and no extra payment shall be made therefore. If, however, there is a separate item in the bill of quantities for setting up of a laboratory and installing testing equipment, such work shall be paid for separately.

1.8 Source of materials for embankment construction shall be arranged by the contractor and got approved by Engineer. The responsibility for arranging and obtaining land for borrowing or exploitation in any other way shall rest with the contractor, who shall ensure smooth and uninterrupted supply of materials for the quantity required in construction during the construction period.

Similarly, supply of aggregates for construction of bridges and various concrete works and stone of large sizes for protection work, etc. shall be from quarries approved by Engineer. Bricks for building works shall be obtained from approved kilns and samples of supply frequently tested for ensuring uniform good quality. Supply of sand should be from approved river beds or crushed sand from approved quarries.

Steel for structural steel work and reinforced concrete shall be obtained directly from **SAIL, RINL, TISCO, JINDAL or VSPL** or other approved suppliers or their local stock yards. Supply of high tensile steel, should be only from approved suppliers for which Engineer's prior approval should be obtained. Responsibility for arranging

uninterrupted supply of good quality materials from source shall be that of the contractor.

1.9 For testing of samples of soil, soil mix, granular material mix, bituminous mix, aggregates, cores, titles, stone, bricks, timber, paints, admixtures, water and other building materials, samples in the required quantities and form shall be supplied to Engineer by the contractor at his own cost.

1.10 For cement, bitumen, mild steel, castings, pipes, bearings and other similar materials for which essential tests are to be carried out at the manufacturer's plants or at laboratories other than the site laboratory, the cost of samples, sampling, testing and the furnishing of test certificates shall be borne by the contractor. Contractor shall also furnish test certificates to Engineer.

1.11 For testing cement concrete works at site during construction, arrangements for supply of samples, sampling, testing and supply of test results shall be made by the contractor as per frequency and number of tests specified in the Handbook of quality control for construction of Roads and Runways (IRC-Special Publication No.11 & IRS Concrete Bridge & Structure Code) and relevant IS Codes or relevant clauses of these specifications. The cost for this shall be borne by the contractor as included in rates quoted for the work.

1.12 The method of sampling and testing of materials shall be as required by the Hand book of quality control for Construction of Road and Runways (IRC special publication No.11), the specifications for road and bridge works of the Ministry of Surface transport (Road Wing) and IRS steel bridges and concrete bridge Codes of ASTM or DIN standard. Where they are contradicting the provisions of IRS, IRC codes or IS Codes shall prevail. Where they are silent or are not specific sound engineering practices shall be adopted as approved by Engineer and his decision will be final and binding on the contractor.

1.13 For the work of embankment (including filling and back filling), sub grade and pavement construction of subsequent layer of same or other material over the finished layer shall be done after due tests and obtaining permission from Engineer. Similar permission from Engineer shall be obtained in respect of other items of works prior to proceeding with the next stage of construction as stipulated in different codes/ standards. These specifications are as required by Engineer.

1.14 DEFECTIVE MATERIALS

All materials which Engineer or his representative has determined as not conforming to requirement of the contract will be rejected, whether in place or not. They shall be removed immediately from site as directed. Materials, which have been found defective and which have been subsequently corrected shall not be used in the work unless approval is accorded in writing by Engineer Upon failure of the contractor to comply with any order of Engineer/ his representative given under this clause. Engineer/ his representative shall have authority to cause the removal of rejected material and to recover the removal cost thereof from any money due to the contractor.

1.15 IMPORTED MATERIALS

At the time of submission of tenders, the contractor shall furnish a list of materials/ finished products manufactured, produced or fabricated outside India, which he proposes to use in the work. The contractor shall not be entitled to extension of time for delays caused in supply due to acts or events occurring outside India and it shall be the contractor's responsibility to make timely delivery to the job site of all such materials obtained from abroad.

Materials imported from outside India shall conform to relevant specifications and tests indicated in the specifications or standards referred to in the contracts and approved by Engineer. Tenderers should list such materials in their tenders.

In case where materials finished products are not covered by specifications in the contract, the details of specifications proposed to be followed and the testing procedure

as well as laboratories/ establishments where tests are to be carried out shall be specifically brought out in the offer and agreed to by Engineer.

The contractor shall furnish a certificate of compliance of the tests carried out to Engineer. In addition, certified mill test reports clearly identifying the lots of materials shall be furnished at the contractor's cost.

1.16 The contractor shall engage a quality graduate Civil Engineer for supervision of the work and quality control at site failing which a penalty of Rs.10,000.00 (Ten thousand only) per month will be recovered from on account bills payable to him).

SPECIAL CONDITIONS OF CONTRACT
QUALITY CONTROL FOR CONCRETE

1.1 **28 days strength of various grades of concrete referred in various schedules shall be as under.**

1.2 **Test during actual execution of Work (Works Tests) :**

1.2.1. Minimum frequency of samples of concrete and criteria for acceptance shall be as per Table given below :

Minimum No. of specimens taken from same shift work		**Minimum frequency**		**Criteria for acceptance**
7 days Compressive strength an optional test if desired	28 days compressive strength test	Qty. of concrete in the Work M^3		
3	3	1-50 51 & above	1. 1 plus one sample for each additional 50 M3 or part there of Note : I) At least one sample shall be taken from each shift or as directed by Engineer. II) For each sample 6 cubes shall be cast, 3 for testing at 7 days & 3 at 28 days.	As per clause 8.7.6 of IRS concrete Bridge Code, 1997, with all up to date correction slips.

1.2 **ACCEPTANCE CRITERIA FOR CONCRETE**

Acceptance criteria for concrete has been stipulated vide clause 6 & 15 of IS-456/2000(CODE OF PRACTICE FOR PLAIN & REINFORCED CONCRETE). Therefore, for all concreting works, the acceptance criteria should be followed as per IS-456/2000

CHAPTER-XIII

SCHEDULE OF ITEMS OF WORKS & APPROXIMATE QUANTITIES

NATURE & SCOPE OF WORK:

NAME OF WORK: SUPPLYING, FABRICATION, ASSEMBLING AND ERECTION OF STEEL THROUGH GIRDERS/ PLATE GIRDERS/ COMPOSITE GIRDERS FOR 03 NOS MAJOR BRIDGES HAVING TOTAL 12 SPANS [BRIDGE NO 78 (78.8M X 6 NOS), BRIDGE NO 167-168 (78.8M X 6 NOS)], INCLUDING METALIZING OF MEMBERS, FITTING & FIXING OF BEARINGS, FITTING OF CHANNEL SLEEPERS/ H-BEAM SLEEPERS, TRACK LINKING, PAINTING AND OTHER ANCILLIARY WORKS IN BETWEEN STATIONS BAIRABI AND SAIRANG IN CONNECTION WITH THE CONSTRUCTION OF NEW BG RAILWAY LINE FROM BAIRABI TO SAIRANG (MIZORAM)

THE SALIENT FEATURES OF THE PROPOSED CONSTRUCTION IS SUPPLYING, FABRICATION, ASSEMBLING ERECTION, FITTING & FIXING, LAUNCHING OWT STEEL GIRDER AND COMPOSITE GIRDER WITH BEARING

NATURE & SCOPE OF WORK:

1.0 SCHEDULE-A: (Item no. 1)
(Execution of NS item of works) – Supplying of all type of structural steel, fabrication, transportation, trial assembly, assembly, erection/ slewing/ end launching of steel girders etc.

2.0 SCHEDULE-B: (Item no. 2)
(Execution of USSOR items of works) – Erecting roof trusses, tank staging etc.

3.0 SCHEDULE-C: (Item no. 3)
(Execution of NS item of works) – Carrying out Ultrasonic test etc.

5.0 SCHEDULE-D: (Item no. 4)
(Execution of NS item of works) – Fixing of galvanized H-beam sleepers etc.

5.0 SCHEDULE-E: (Item no. 5)
(USSOR items of works) – Any other item of work not included in Sch- A-J, but reqd. to be executed for successful.

6.0 SCHEDULE-F: (Item no. 6)
(USSOR items of works) – Earthwork in cutting in formation. Trolley Refuge, etc.

7.0 SCHEDULE-G: (Item no. 7)
(USSOR items of works) – Felling of trees of girth.

8.0 SCHEDULE-H: (Item no. 8)
(USSOR items of works) – Earthwork in filling in embankment.

9.0 SCHEDULE-I: (Item no. 9)
(USSOR items of works) – Supplying of Structul Steel to Fe410B, etc.
The details of items of works to be executed are specified in schedule of items and Price Bid [**BOQ1 to BOQ9]** enclosed.

- The contract envisages all permanent and temporary works which are necessary for the efficient execution and completion of works.
- The information and data stated herein and to be incorporated in contracts elsewhere is for the general guidance only and is subject to vary with more detailed site investigation.

Tender No. eNIT/DGM (P-V)/BRIDGES/MIZORAM/2150/3131/41-2019

NAME OF WORK: SUPPLYING, FABRICATION, ASSEMBLING AND ERECTION OF STEEL THROUGH GIRDERS/ PLATE GIRDERS/ COMPOSITE GIRDERS FOR 03 NOS MAJOR BRIDGES HAVING TOTAL 12 SPANS [BRIDGE NO 78 (78.8M X 6 NOS), BRIDGE NO 167-168 (78.8M X 6 NOS)], INCLUDING METALIZING OF MEMBERS, FITTING & FIXING OF BEARINGS, FITTING OF CHANNEL SLEEPERS/ H-BEAM SLEEPERS, TRACK LINKING, PAINTING AND OTHER ANCILLIARY WORKS IN BETWEEN STATIONS BAIRABI AND SARANG IN CONNECTION WITH THE CONSTRUCTION OF NEW BG RAILWAY LINE FROM BAIRABI TO SAIRANG (MIZORAM)

ABSTRACT OF SCHEDULE OF ITEMS OF WORKS AND ESTIMATED COST

Sl. No.	Description of works	Basic Cost (Rs.)
1	**Schedule-A** **(Execution of NS item of works)**– Supplying of all type of structural steel, fabrication, transportation, trial assembly, assembly, erection/ slewing/ end launching of steel girders etc.	**114,06,72,614.00**
2	**Schedule-B** **(Execution of USSOR items of works)** – Erecting roof trusses, tank staging etc.	**5,29,38,248.00**
3	**Schedule-C** **(Execution of NS item of works)** – Carrying out Ultrasonic test etc.	**1,57,74,528.00**
4	**Schedule-D** **(Execution of NS item of works)** – Fixing of galvanized H-beam sleepers etc.	**95,88,919.00**
5	**Schedule-E** **(USSOR items of works)** – Any other item of work not included in Sch- A-J, but reqd. to be executed for successful	**27,50,000.00**
6	**Schedule-F** **(USSOR items of works)** – Earthwork in cutting in formation. Trolley Refuge, etc	**44,32,567.00**
7	**Schedule-G** **(USSOR items of works)** – Felling of trees of girth.	**90,367.00**
8	**Schedule-H** **(USSOR items of works)** – Earthwork in filling in embankment.	**88,34,031.00**
9	**Schedule-I** **(USSOR items of works)** – Supplying of Structural Steel to Fe410B, etc.	**1,58,54,495.00**
	Total Cost (Rs.)	**125,09,35,771.00**

NOTE:

1.0 Tenderer(s)/Contractor(s) have to quote only percentage above/below/at par rate in the schedule.

2.0 The work is required for an important National Project. The sub-structure works are already in progress. The super structure works for this bridge are planned to be taken up

progressively basing on completion of particular portion of the sub-structure as per direction of Engineer-in-charge. Accordingly, the super structure agency will be working in due course on both sides of approach of the bridge i.e. on Bairabi to SAIRANG (Mizoram) end. The Engineer-in-charge will co-ordinate between the two agencies (i.e. sub-structure agency and super-structure agency) and that his decision will be final and binding in case of dispute between the two agencies.

3.0 The contractor has to arrange all materials, tools, tackles, machineries, cranes, consumables etc. whatever required for the work.