



EAST CENTRAL RAILWAY
(CONSTRUCTION DEPARTMENT)

Tender Notice No. 01 of 2016-17 (Open)/South two packet system
Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Date of Dropping of Tender Document: 18.05.16

Date of Opening of Tender Box: 20.05.16

Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna – 800 004.

by



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(CONSTRUCTION DEPARTMENT)

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Technical Bid

PART-I

**East Central Railway,
Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna – 800 004**

*Tender Notice No.01 of 2016-17 (Open)/South two packet system
Tender No. 02 of 2016-17 (Open)/South in two packet system*

Forwarding Letter: Detailing salient features of the tender

Issued to: _____

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Details of Demand Draft/Railway's Money Receipt towards cost of tender document.

DEMAND DRAFT/Railway's Money Receipt No.-----DATE-----
ISSUED BY -----
AMOUNT Rs-----

Dear Sir,

- 1.0 Sealed tenders have been invited for and behalf of the President of India for the above mentioned work as per tender notice quoted above. A copy of the tender notice is enclosed herewith as Chapter-II.
- 2.0 The tender document is hereby being issued to you on your request and on your having deposited the requisite cost of the tender document as per aforesaid details. The tender document is being issued with further condition that you agree to abide by the conditions laid down hereinafter in the tender document before submitting your tender.

Or

 - a) The document may be downloaded from website which shall be treated as issued tender document for submitting the bid. However, Demand Draft /Railway Money Receipt (separate demand draft /Railway money Receipt other than that of Earnest money) for an amount prescribed at Para I of tender document in favour of "FA&CAO/Con/E.C.Railway", towards the cost of tender document payable at Patna will have to be enclosed with the tender document. In case, the offer is not accompanied with the valid demand draft/pay order for the cost of tender document as detailed above, the tender will be summarily rejected.
 - b) Please note that the document is being allowed to be downloaded with further condition that you agree to abide by the conditions laid down hertein after in the tender document before submitting your tender.
 - c) Please note that the end of tender document is being marked as "END OF DOCUMENT". The total document is to be download for submission of the offer, otherwise the document will be treated as invalid.
 - d) Please note that if any change/additions/deletion with malafied intention is made by the bidder, the tender is liable for summarily rejection. Further if the same is detected at any stage even after award of the tender, all necessary action including banning of business would be taken.
 - e) Online tender documents is available on website for the potential bidders which may be downloaded from the site and filled in legibly, after which the tender documents should be submitted.
- 3.0 The Railway, before the due date of opening, may on its own or in response to any clarification requested or suggested by any person including that of the Tenderer, may modify the tender document at its sole discretion.
- 4.0 The tender document includes many chapters, drawings and annexure as enclosed, which are integral parts of the tender documents.
- 5.0 **Process of tendering:-** This tenderer are being invited two packet system, Pocket – I will contain Technical Bid and Pocket – II will contain Commercial Bid /Financial Bid. On the scheduled date of opening, only packet –I will be opened in the presence of tenderers. The technical capabilities of the tenderers will be examined by the Railway based on the documents submitted by them in Pocket –I as per the eligibility criteria laid down in the tender notice. The successful tenderer who will be considered technically acceptable and eligible will be informed and the commercial bids of these tenderers will be opened on the date and time notified to these tenderers. The commercial bids of unsuccessful tenderers will not be opened and will be returned back to them.

. This tender document contains **128 pages** (including cover pages) and consisting of **XIV chapters**

Chapter No.	Nature of document	Page reference
	PART-I (Technical Bid)	1-2
I	Forwarding letter	3-5
IA	Declaration by Tenderer	6
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III	Conditions of tender and instruction to tenderer(s) with Annexure I to XIII	10-51
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XIV	Additional special conditions and specifications for steel works & bearings	118-128

- 6.0 After completing the tender documents, they should be separately sealed in two different envelopes and marked clearly PACKET-I (containing PART-I **Technical Bid** documents) and PACKET-II **Financial Bid** (Containing PART-II documents). These two envelopes will then be placed inside a 3rd envelope. The name of the work and the tender no shall be clearly written on the 3rd envelope and shall be submitted duly sealed by the due time and date of dropping of tender.
- 7.0 These tender documents also include as integral part of these documents, the East Central Railway's General Conditions of Contract 2014 as amended by updated correction slips here in after referred to as "GCC-2014", E.C. Railways Unified Standard Schedule of Rates (USSOR) Engineering Department 2012, as amended by updated correction slips hereinafter referred to as East Central Railway's "Unified Standard Schedule of Rates (USSOR 2012), Engineering Department 2012" Indian Railway unified Standard Specifications for (Works and Materials) Engineering Department 2010 as amended by updated correction slips and all other books/codes/manuals etc. mentioned elsewhere in these documents. These books are hereinafter called the "Books of Reference". General arrangement drawings enclosed with these documents are only for guidance and may change during detailed design approval/execution stage.
- 8.0 All the above mentioned chapters and above named documents, taken together, if not scored off, shall constitute the complete tender document hereinafter referred to as "tender document" and have to be read together and acted upon accordingly. No part of the tender document can be relied upon or acted upon in isolation.
- 9.0 In the event of any conflict between the Books of reference and contents of various chapters of these documents and references therein, the matter shall be referred to Engineer, whose decision in this regard shall be final binding and conclusive.
- 10.0 **Scope of the Work:** Scope of the work under this work has been described in detail in Para 3 of Chapter III.
- 11.0 **Approximate cost of the work:** The tender assessed cost of the work covered by this tender is approximately **Rs. 39,35,05,000.00 Rs. Thirty Nine Crore Thirty Five Lakh Five Thousand) Only as per details given in Annexure:**
- 12.0 **Date of dropping and opening:** As per tender notice and corrigendum(if any) as per chapter –II of these documents.
- 13.0 **Credentials:** Tenderers should submit the details of their credentials in the Annexure I & II of Chapter-III of tender document with supporting documents. Tenders submitted without credentials as per Annexure I & II of Chapter-III of Tender document are liable to be rejected.

14.0 **Opening of the tender:** Tender will be received/dropped in the office of (CAO/Con/EC Rly. Mahendrughat, Patna CAO/Con/N. Rly. Kashmere Gate, Delhi and Dy. Chief Engineer/Con/BRKA) up to the date of dropping indicated in Tender Notice as per chapter-II of this Tender Document.

In case the tender dropping day is declared a holiday on account of any reason, the tender box shall be closed at the same time on the next working day and if opening day is also declared a holiday, the tender box shall be opened at the same time on the next working day.

15.0 **Amount of Earnest Money:** The Earnest Money should be in cash (in the form of Railway Money Receipt) or Banker's Cheques/Demand Draft in favour of FA & CAO/Con/East Central Railway, Mahendrughat, Patna, executed by State Bank of India or any of the Nationalized Banks or by a schedule Bank.. Tender without proper Earnest Money and cost of tender document will be summarily rejected.

The amount of Rs.21,17,525.00 (Rs. Twenty One Lakh Seventeen Thousand Five Hundred Twenty Five only) required to be deposited along with the tender as indicated in the tender notice/Corrigendum.

Note: Cash in the form of Railway Money Receipt issued by the Divisional Cashier, Sonpur/Danapur/Dhanbad/Samastipur/Mughalsarai Division.

16.0 **Validity of the tender:** Tenderer shall keep his tender open for a period of 180 days from the date of opening of the tender.

17.0 **Period of Completion: 18 (Eighteen) Months.** The successful Tenderer shall complete the entire work within the period specified in the tender notice viz. **18 (Eighteen) months**. The period starts from the date of issue of the letter of acceptance by the Railway to such Tenderer.

18.0 **Schedule of Items:** *The tenderer shall fill in his rates for doing this work on the prescribed page/sheet of the chapter VI of these documents. Rebate, if any should be quoted in Schedule "D" as contained in Chapter VI. Various items of the works covered under this work have been detailed in Schedules 'A-I to C-II' which enclosed in chapter VI of this tender documents.*

19.0 Rates shall have to be quoted as percentage above or below for each schedule separately. Tenderers must not quote item wise rates. In case any tenderer quotes unified percentage for each schedule and also quotes item wise rates against individual items, no cognizance would be taken for the item wise rates quoted by the tenderers. However, railways reserves their right to cancel any tender wherein item wise rates have been quoted.

20.0 **Specifications of the work:** The work shall be carried out as per specifications contained in the tender document or otherwise referred to.

21.0 **Eligibility Criteria:-** Applicable for tender value above Rs.50.00 lakhs.

22.0 **Advance to the Contractor** :- *Applicable* in terms of clause 37A of chapter –III.

23.0 **Price variation clause** :- *Applicable* in terms of clause 35 of chapter –III.

24.0 **Purchase preference clause** :- *Not Applicable* in terms of clause 9 of Chapter-III.

25.0 **Performance Guarantee** :- The successful tenderer will required to furnished a Performance Guarantee (PG) as per clause 28 of Chapter-III of Tender Document dealing with such provisions.

26.0 **Incentive Bonus Clause** :- *Not Applicable* in terms of clause 37(B) of chapter-III.

27.0 **Joint Venture firms** :- Permitted to participate, if tender value is Rs.10.00 Cr. or more.

28.0 **Accepting Authority** : The acceptance of this tender rests with the CAO/Con/South for and on behalf of the President of India.

Enclosures: The tender document **Total 128 pages**

Witness

- 1.
- 2.

Signature of Tenderer

Date _____

**East Central Railway,
Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna – 800004.**

DECLARATION BY THE TENDERER

1. The tender document enclosed containing pages (---- No of pages containing tender documents and ---
----- No of pages of enclosure). All the pages have been signed by me.

2. Details of cost of tender document:-

SN	Cost of tender document	Details of Demand Draft/Railway Money Receipt(for cash) /Bankers cheque and date	Name of the issuing bank with address	Validity of DD/DPO

3. Details of Earnest Money :-

SN	Amount of Earnest Money	Details of Demand Draft/ Railway Money Receipt/Demand Pay Order etc. as per admissible in tender document and date	Name of the issuing authority with address	Validity of the instrument

4. Details of Bank account No:-

SN	Name of the Bank with address	Bank Account no.	Name of Payee	IFSC Code	Nature of Account	Option for payment through RTGS/NEFT (Yes/No)

5. Permanent Account No(PAN) :-

Name and style of Account holder	Permanent Account No(PAN)

6. My business is not banned by Railway/Govt./Public Sector etc and I am legally eligible to bid with Railways.

Witness:

1.

Signature of Tenderer(s)

2.

Date:

**East Central Railway
(Construction Department)**

SEALED OPEN TENDERS ARE INVITED, ON BEHALF OF PRESIDENT OF INDIA, FOR THE UNDER MENTIONED WORK:-

SN	TENDER NOTICE	Particulars				
	TENDER NO.	01 of 2016-17(Open) South in two packet system				
		01 of 2016-17(Open) South in two packet system	02 of 2016-17(Open) South in two packet system	03 of 2016-17(Open) South in two packet system	04 of 2016-17(Open) South in two packet system	05 of 2016-17(Open) South in two packet system
1	Name of work with its location	Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa Road (Including Garhwa Road Yard) and Garhwa (Excluding Garhwa yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway Division in ECR	Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.	Earth Work in Cutting, filling, blanketing, turfing, construction of major & minor bridges, Limited Height Sub-way, Foot Over Bridge, S & T buildings, Staff quarters TYPE-II (12 Nos) and TYPE -III (2 Nos), water supply arrangements, development of circulating area, approach road, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, and other associated works as per Railways' specification and standards between Damodar River(Chainage:97.960Km) to Patratu in connection with doubling between Ranchi Road and Patratu under Dhanbad Division of East Central Railway.	Earth Work in Cutting, filling, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, Foot Over Bridge, S & T buildings, water supply arrangements, approach road, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, and other associated works as per Railways' specification and standards between Ranchi Road(excluding) to Damodar River(Chainage 97.960Km) in connection with doubling between Ranchi Road and Patratu under Dhanbad Division of East Central Railway.	Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Meralgram (including Meralgram Yard) and Ramna (including Ramna Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway
2	Approx. cost of the work (Rs.)	24,49,34,000	39,35,05,000	88,33,47,000	31,69,62,000.00	33,14,48,000.00
3	Earnest Money to be deposited (Rs.)	13,74,670	21,17,525	45,66,735	17,34,810.00	18,07,240
4	Cost of Tender Document (Rs.)	10,000	10,000.00	25,000	10,000	10,000
5	Date & Time for submission of Tender and Date & Time of opening of Tender	18.05.16 at 13.30 to 15.30 & 20.05.16 at 12.30				
6	Website particulars, Notice board location where complete details of tender can be seen and address of the office from where the tender from can be purchased etc.	Complete details of tender can be seen and address of the office from where the tender from can be purchased etc. at Notice board of "Construction Office at Mahendrughat, Patna, DY.CE/C/ Barkakana and Website "http://www.ecr.indianrailways.gov.in" or "http://www.tenders.gov.in".				

For CAO/Construction/South



East Central Railway (Construction Department)					
Tender Notice Number	01 of 2016-17 (Open) South in two packet system				
S.No.	1	2	3	4	5
Tender Number	01 of 2016-17(Open) South in two packet system	02 of 2016-17(Open) South in two packet system	03 of 2016-17(Open) South in two packet system	04 of 2016-17(Open) South in two packet system	05 of 2016-17(Open) South in two packet system
Office Inviting Tender	CAO/Con/South/MHX, Patna				
Name of Work	Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa Road (Including Garwa Road Yard) and Garhwa (Excluding Garhwa yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central RailwayDivision in ECR	Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.	Earth Work in Cutting, filling, blanketing, turfing, construction of major & minor bridges, Limited Height Sub-way, Foot Over Bridge, S & T buildings, Staff quarters TYPE-II (12 Nos) and TYPE -III (2 Nos), water supply arrangements, development of circulating area, approach road, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, and other associated works as per Railways' specification and standards between Damodar River(Chainage:97.960Km) to Patratu in connection with doubling between Ranchi Road and Patratu under Dhanbad Division of East Central Railway.	Earth Work in Cutting, filling, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, Foot Over Bridge, S & T buildings, water supply arrangements, approach road, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, and other associated works as per Railways' specification and standards between Ranchi Road(excluding) to Damodar River(Chainage 97.960Km) in connection with doubling between Ranchi Road and Patratu under Dhanbad Division of East Central Railway.	Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Meralgram (including Meralgram Yard) and Ramna (including Ramna Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway
Time of Completion after issue of LOA	15 Months	18 Months	18 Months	15 Months	15 Months
Approximate Cost	24,49,34,000	393505000	883347000	316962000.00	33,14,48,000.00
EMD	13,74,670	2117525	4566735	1734810.00	18,07,240
Cost of Tender Document	10000	10,000.00	25000	10000	10000
*Similar Work	Earth work in formation and construction of bridges				
AOP/JV allowed or not (allowed for >10 Cr.)	Allowed	Allowed	Allowed	Allowed	Allowed
Price Variation Clause is applicable or not.	Applicable	Applicable	Applicable	Applicable	Applicable
Mobilization advance clause is applicable or not.	Applicable	Applicable	Applicable	Applicable	Applicable
Stage Payment for Steel Clause is applicable or not.	Not Applicable	Applicable	Applicable	Applicable	Applicable
Incentive Bonus Clause is applicable or not.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Date & Time of Dropping	On 18.05.16 from 13.30 hrs - 15.30hrs				
Place of Dropping	CAO/Con/Mahendrughat, CAO/C/Kashmere gate, Delhi, and Dy CE/Con/Barkakana				
Date & Time of Opening	20.05.16 at 12.30 hrs				
Place of Opening	CAO/Con/Mahendrughat, Patna				

Validity of Tender / Offer	180 days
Availability of Tender Document	CAO/Con/Mahendrughat, Patna From 13.04.16 to 17.05.16 between 10.00 hrs to 16.00 hrs. On production of demand ft from any nationalized/Scheduled bank in favour of FA & CAO/Con/ECR, Mahendrughat, Patna or money receipt issued by the Divisional Cashier
Eligibility Criteria	<p>Works Experience:- Contractor should have completed in the last three financial years (i.e. current year and three previous financial years), at least one *similar work for minimum value of 35% of Advertised tender value, is clarified as under:- 1.1 Similar nature of work physically completed within the qualifying period, i.e. the last 3 financial years and current financial year (even though the work might have commenced before the qualifying period) should only be considered in evaluating the eligibility criteria. 1.2 The total value of similar nature of work completed during the qualifying period and not the payments received within qualifying period alone, should be considered. In case, the final bill of similar nature of work has not been passed and final measurements have not been recorded, the paid amount including statutory deduction is to be considered. If final measurements have been recorded and work has been completed with negative variation, then also the paid amount including statutory deduction is to be considered.</p> <p>However, if final measurements have been recorded and work has been completed with positive variation but variation has not been sanctioned, original agreement value or last sanctioned agreement value whichever is lower should be considered for judging eligibility.</p> <p>1.3 In the case of composite works involving combination of different works, even separate completed works of required value should be considered while evaluating the eligibility criteria. For example, in a tender for bridge work where similar nature of work has been defined as bridge work with pile foundation and PSC superstructure, a tenderer, who has completed one bridge work with pile foundation of value at least equal to 35% of the tender value and also has completed one bridge work with PSC superstructure of value at least equal to 35% of the tender value, should be considered as having fulfilled the eligibility criteria of having completed single similar nature of work. Completion certificate of the work issued from Central Govt./State Govt./Central P.S.Us/State P.S.Us and other Government Agencies shall only be accepted, credential from Private Individuals shall not be accepted.</p> <p>Payment Certificate:-1.4 Total contractual amount received during the last three financial years and in the current financial year, should be a minimum of 150% of advertised tender value as per audited balance sheet duly certified by the Chartered Accountant. For the financial year ended and/or the current financial year if audited balance sheet is not available contractual amount received duly certified by the chartered accountant should be submitted as a proof of turnover.</p> <p>1.5 Alternatively at least payment certificates from Central Govt./ State Govt./Central P.S.Us/State P.S.Us and other Government Agencies for a minimum of 150% of advertised tender value may be submitted.</p>
1. Tenders received after specified time and date are liable to be rejected.	
2. For further details tender Document may be referred to.	
3. In case any tenderer wishes to obtain the tender document by post, Rs. 500/- (Five hundred) extra should be sent by demand draft in favor of FA & CAO/EC Rly, Mahendrughat, Patna within 15 Days prior to Date of Dropping. However, Railway will not be responsible for non-receipt or delayed receipt of such tender document.	
4. Tender notice and Document will also be available on " http://www.tenders.gov.in or http://www.ecr.indianrailways.gov.in "	
5. Tenderers are requested to visit the website frequently for latest corrigendum/correction etc. in response to this tender. The Corrigendum may be issued up to 10 days before opening of Tender	
6. Performance Guarantee @ 5% (@ 10% for failed contractor in case of risk and cost tenders) to be deposited within 30 days after issue of LOA by Tenderer. Validity of PG shall be DOC+60 days.	
6. Performance Guarantee @ 5% (@ 10% for failed contractor in case of risk and cost tenders) to be deposited within 30 days after issue of LOA by Tenderer. Validity of PG shall be DOC+60 days.	
7. Tender can also be sent to Chief Administrative Office/Construction/East Central Railway, Mahendrughat, Patna by registered post/speed post/courier service to reach before 12.00 hrs. of the date of dropping. However, Rly. Will not be responsible for non-receipt or delayed receipt of such tenders.	
8. The tender must be submitted with proper amount of Earnest Money in favour of FA & CAO/Con/ECR, Mahendrughat, Patna. Tender without proper Earnest Money and cost of tender document will be summarily rejected. The tender form is not transferable. The Earnest Money should be in cash (in the form of Railway Money Receipt) or Banker's Cheques/Demand Draft in favour of FA & CAO/Con/East Central Railway, Mahendrughat, Patna, executed by State Bank of India or any of the Nationalized Banks or by a schedule Bank. Earnest Money in any other form will not be accepted and such tenders will be rejected summarily. Note: Cash in the form of money receipt issued by the Divisional Cashier, Sonpur/Danapur/Dhanbad/Samastipur/Mughalsarai Division.	
9. Tenders for supply of ballast/stone chips/ boulders/ other minor mineral such as earthwork. For such mining in Bihar, contractor is required to submit form M&N: (a) Tender should have valid license/lease from the state govt. for mining ballast/chips/boulders or should have entered into a memorandum of understanding with a valid lessee. Legal document in proof of the same should be submitted along with the tender document. (b) Whereas Income tax and Sales tax shall be deducted from the contractor's bills as per extant instructions issued from time to time, the contractor shall furnish certificate or payment of Royalty charges from the concerned State Mining Department before payment of such bills.	
10. Tenderer should sign each and every page of tender documents and its Annexure/enclosures attached by them. A certificate in this regards should be furnished by them as per Performa furnished in tender documents. No cognizance will be given in any unsigned document enclosed as ANNEXURE.	
11. In case of any discrepancy between the tender documents down loaded from internet and the master approved copy available in office, the later shall prevail and will be binding on tenderer(s). No claim on this account will be entertained.	
12. Current financial year will be taken as financial year of dropping.	
13. If the tenderer(s) gives/give wrong information/wrong credential(s)/tempered tender document or any other document in his/their tender or creates/create circumstances for the acceptance of his/their tender, the railway reserves the right to reject such tender at any stage.	
13.1 An affidavit is required to be submitted by all tenderers (as given in annexure XIII page 51 based on this affidavit, Tender committee will deliberate and decide eligibility of tenders. However, the suitability/eligibility of shortlisted tenders will be provisional and same shall be subject to verification of their credentials from issuing authority. Only lowest eligible tender will be got verified. If contents in documents submitted by tenders are found to be incorrect/ false, action will be taken against such tenderers as per provisions contained in Affidavit submitted by them as per para 13.1.1. In such eventuality, next lowest eligible tenderer/offer will be considered.	
13.1.1 If the tenderer(s) fails to submit the affidavit as prescribed in clause 13.1 of instruction to tenderer(s) along with the offer, the tender offer shall be considered incomplete and will be rejected summarily.	

East Central Railway,
Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna – 800004.

Tender No. 02 of 2016-17 (Open)/South in two packet system

CONDITIONS OF TENDER AND INSTRUCTIONS TO TENDERER(S)

1. a) **TENDERER:**
The person(s)/Firm(s) who submitted these tender documents as an offer to carry out the work detailed in chapter II are termed tenderer(s) in these documents.
 - b) **THE CONTRACTOR (S):**
The tenderer(s) whose tender(s) has been accepted by the Railway shall thereafter be termed Contractor(s) and these tender documents of the accepted tender(s) shall become a part of the Contract/Agreement between the Contractors and the Railway.
2. **BOOKS OF REFERENCE:**
These tender documents are to be read with the followings books/codes/manuals with versions updated/corrected/modified upto the date of tender opening:
- (A) **Railway/IRS books of reference:-**
- 1) E.C. Railway Engineering Department- General Conditions of Contract -2014 as amended by updated correction slips termed GCC 2014.
 - 2) E.C. Railway Engineering Department USSOR'2012, as amended by updated correction slips (termed USSOR'2012) up to the date of tender dropping.
 - 3) Standard specifications contained in East Central Railway Hand Book Standard Specification for works and materials – 2008.
 - 4) I.R.S Code of practice for plain concrete for plain concrete construction, 1982.
 - 5) I.R.S. Code of practice for electric welding of mild steel structures.
 - 6) Indian Railway Code of Practice of Plain/Reinforced and pre-stressed concrete for general/bridge construction (Concrete bridge Code 1997 incorporating all upto date Correction Slips).
 - 7) Indian Railway Standard (IRS) Bridge sub-structure and foundations code-code of practice for the design of the substructure and foundation of Bridges adopted 1936 – Revised – 1985 (Hereinafter referred to as “Substructure Code”)- with up to date correction slips.
 - 8) IRS : Welded Bridge code for steel bridge girders- 2001
 - 9) IRS : Fabrication and Erection of Steel Girder Bridges & Locomotive Turn Tables. (B1-2001).
 - 10) IRS: Erection and Riveting of Bridge Girders (B2-1979)
 - 11) IRS: Specification for Steel Bridge code Revised 1962.
 - 12) Indian Railways Bridge Manual, 1998.
 - 13) Indian Railways P. Way Manual. 2004
 - 14) Indian Railways Works Manual 2000
 - 15) Indian Railways MANUAL ON THE DESIGN AND CONSTRUCTION OF WELL AND PILE FOUNDATIONS(1985)
- (B) **Indian Roads Congress codes and specifications.**
- 1) IRC-5: Standard specifications and Code of practice for Road Bridges –Section – I – General features of design
 - 2) IRC-21: Standard specifications and Code of practice for Road Bridges- Sections –III- Cement concrete (Plain & reinforced)
 - 3) IRC-24: Standard specifications and Code of Practice for Road Bridge –Section –V- Steel Road Bridges.
 - 4) IRC- 83: Bearings for bridges.
 - 5) IRC-78: Road Bridges.
 - 6) IRC-87: Design and erection of false work for road bridges.

(C) Indian Standards Codes & Specifications:

- 1 IS: 34 – White lead for paints.
- 2 IS: 57 – Red lead for paints and other purposes.
- 3 IS: 75 – Linseed oil, raw and refined.
- 4 IS: 77 – Linseed oil, boiled for paints.
- 5 IS: 102 Ready mixed paints, brushing, red lead, non-settling, priming.
- 6 IS: 104 – Ready mixed paint, brushing, zinc chrome, priming.
- 7 IS: 123 – Ready mixed paints, brushing, finishing, semi-gloss, for general purposes to Indian Colors etc.
- 8 IS: 280- Mild steel wire for general engineering purposes.
- 9 IS: 383- Coarse and fine aggregates from natural sources for concrete.
- 10 IS: 456- Plain and reinforced concrete.
- 11 IS: 487- Brush, paint and varnish.
- 12 IS: 516 – Method of test for strength of concrete.
- 13 IS: 786- Conversion factors and conversion tables.
- 14 IS: 800 General constructions in steel.
- 15 IS: 814- Covered electrodes for manual metal arc welding.
- 16 IS: 816- Metal arc welding for general construction in mild steel.
- 17 IS: 817- Training and testing of metal arc welders.
- 18 IS: 819- Resistance spot welding for light assemblies in mild steel
- 19 IS: 875 (all 5 parts) – design loads (other than earthquakes) for buildings and structures.
- 20 IS: 883 – Design of structural timber in buildings.
- 21 IS: 887 – Animal tallow.
- 22 IS: 1024 – Welding in bridges and structures subject to dynamic loading.
- 23 IS: 1148- Hot rolled rivet bars (up to 40mm dia) for structural purposes.
- 24 IS: 1149- High tensile steel rivet bars for structural purposes.
- 25 IS: 1182- Radiographic examination of butt joints in steep plates.
- 26 IS: 1200 (all relevant parts) - Method of measurement of building and civil engineering works.
- 27 IS: 1261 - Seam welding in mild steel.
- 28 IS: 1270- Metric steel tape measure.
- 29 IS: 1323- Oxy-acetylene welding for structural work in mild steel.
- 30 IS: 1343 – Prestressed concrete.
- 31 IS: 1786- High strength deformed steel bars & wires for concrete reinforcement.
- 32 IS: 1791 – Batch type concrete mixers.
- 33 IS: 1852- Rolling and cutting tolerances for hot rolled steel products.
- 34 IS: 1892- Subsurface investigations for foundations.
- 35 IS: 1915- Steel bridge code
- 36 IS: 1929 – Hot forged steel rivets for hot closing (12 to 36mm dia)
- 37 IS: 2062 – Steel for general structural purposes.
- 38 IS: 2074- Ready mixed paint, air drying, red oxide-zinc chrome, priming.
- 39 IS: 2131- Standard penetration test for soils.
- 40 IS: 2132- Thin walled tube sampling of soils
- 41 IS: 2339- Aluminum paints for general purposes, in dual container.
- 42 IS: 2386 (all 8 parts) – Tests for aggregates for concrete.
- 43 IS: 2595- Radiographic testing.
- 44 IS: 2720 (all 41 parts) - Method of tests for soils.
- 45 IS: 2911- Design and construction of pile foundation.
- 46 IS: 3085- Method of test for permeability of cement mortar and concrete.
- 47 IS: 3502- Steel Chequered plates.
- 48 IS: 3764- Safety code for excavation work.
- 49 IS: 3955- Design and construction of well foundations.
- 50 IS: 4081- Safety code for blasting and related drilling operations.
- 51 IS: 4326- Earthquake resistant design and construction of buildings.
- 52 IS: 5624- Foundation bolts.
- 53 IS: 5666- Etch primer.
- 54 IS: 6586- Metal spraying for protection of iron steel.

- 55 IS: 6925- Methods of test for determination of water soluble chlorides in concrete admixtures.
 56 IS: 7205- Safety code for erection of structural steel work.
 57 IS: 7215- Tolerances for fabrication of steel structures.
 58 IS: 7293- Safety code for working with construction machinery.
 59 IS: 7320 – Concrete slump test apparatus.
 60 IS: 8112- 43 Grade OPC.
 61 IS: 8500- Structural steel – Micro alloyed (Medium and high strength qualities).
 62 IS: 8629- Protection of iron and steel structures from atmospheric corrosion.
 63 IS: 9103 – Admixtures for concrete.
 64 IS: 9595- Metal Arc Welding.
 65 IS: 10262- Concrete mix design.
 66 IS: 13920- Ductile detailing of reinforced concrete structures subjected to seismic forces.
 67 SP 6, 7, 16, 21, 22, 23, 24, 34, 36, 52, 60.

(D) Miscellaneous:

- (1) UIC-772R: Bearings of rail bridges.
 (2) BS-5400 (all parts)
 (3) BS-1449, 3484, 1134, 5296

Note: The books of reference shall also include further references mentioned in above mentioned books of references.

3. SCOPE OF TENDER: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

4. ELIGIBILITY CRITERIA: As per tender notice and corrigendum's in chapter II of these documents.

5. EARNEST MONEY:

(i)(a) The tenderer shall be required to deposit earnest money with the tender for the Performance with the stipulation to keep the offer open till such date as specified in the tender notice, under the condition of tender. The earnest money shall be calculated as:-

Value of the Work (Tender Value)	Earnest Money Deposit (EMD)
For works estimated to cost up to Rs. 1 crore	2% of the estimated cost of the work.
For works estimated to cost more than Rs.1 crore	Rs. 2 lakhs plus 1/2 % (half percent) of the excess of estimated cost of work beyond Rs. 1 crore subject to a maximum of Rs.1 crore

The earnest money shall be rounded to the nearest Rs. 10. The earnest money shall be applicable for all modes of tendering.

(b) It shall be understood that the tender documents have been sold/issued to the tenderer and tenderer is permitted to tender in consideration of stipulation on his part, that after submitting his tender he will not resile from his offer or modify the terms and conditions there of in manner not acceptable to the engineer. Should the tenderer fail to observe or comply with said stipulation, the aforesaid amount shall be liable to be forfeited to the Railway.

(c) “The Earnest Money should be in cash (in the form of Railway Money Receipt) or Banker’s Cheques/Demand Draft in favour of FA & CAO/Con/East Central Railway, Mahendrughat, Patna, executed by State Bank of India or any of the Nationalized Banks or by a schedule Bank. Tender without proper Earnest Money and cost of tender document will be summarily rejected Note: Cash in the form of Railway Money Receipt money receipt issued by the Divisional Cashier, Sonpur/Danapur/Dhanbad/Samastipur/Mughalsarai Division.

ii) TENDER WITHOUT EARNEST MONEY:

Tender(s) not accompanied by full earnest money, in the requisite manner, as aforesaid, shall under no circumstances be entertained and will summarily be rejected at the time of opening itself without further reference to the tenderer(s).

iii) APPROPRIATION TOWARDS SECURITY DEPOSIT:

If his tender is accepted this earnest money mention in sub clause (a) above will retained as part security for the due and faithful fulfillment of the contract in terms of clause 16 of the General Condition of Contract.

iv) REFUND:

(a) The Earnest Money of the tenderer(s) whose tender(s) have not been accepted, shall save as herein provided, be returned to them but the Railway shall not be responsible for any loss or depreciation that may happen thereto while in their possession.

(b) No interest will be payable on the Earnest Money.

(c) Earnest money deposited in cash shall be refunded by a cheque drawn in favour of the tenderer and sent to him by Registered Post at the address of the tenderer given by him in the "FORM OF TENDER" contained as Chapter 'V' of the tender document The cheques may be drawn on Reserve Bank of India or on State Bank of India, as indicated by the Tender(s) in the aforesaid "FORM OF TENDER".

(d) In case of the Earnest Money deposited through other instruments, the relevant instruments, duly released shall be sent to the tenderer(s) at the address given by him in these tender documents, by Regd. Post A/D.

(e) **The Railway shall not be responsible for any postal delays or other causes beyond its control.**

v) FORFEITURE

(a) It shall be understood that these documents have been issued to the tenderer(s) and the tenderer is permitted to tender in consideration of the stipulations on his part that after submitting his tender, he will not resile from his offer or modify the rates, terms and conditions thereof in a manner not acceptable to the Railway. Should the Tenderer fail to observe or comply with the said stipulations full amount of Earnest Money shall be forfeited by the Railway.

(b) Further, if any modification of rates, terms and conditions is made by the Tenderer after opening but within the period of validity of the tender and the Railway accepts this tender without those modifications and the letter of acceptance is issued to the tenderer without such modifications, and tenderer refuses to accept the award of contract, the total Earnest Money shall be forfeited.

(c) Full earnest money is liable to be forfeited in case any statement, declaration made by the tenderer is proved wrong/false/incomplete/or such as to withhold any information relevant to the consideration of the tender.

(d) In the event of tenderer(s), whose tender is accepted, resiles from the contract after issue of letter of acceptance or fails to commence the work within 15(Fifteen) days of issue of letter of acceptance or handing over of the site, which ever is late, the provisions contained in clause 62 of GCC - 2014 shall be applicable.

vi) MODE OF PAYMENT:

The total Earnest Money as stipulated in these documents, may be paid by the tenderer in any one of the following, and no other, forms:

(a) Deposit in cash with Divisional Cashier/East Central Railway, Sonapur or Danapur and to attach the money receipt obtained thereof with the tender documents.

(b) Deposit receipts, pay orders or demand drafts executed by State Bank of India or any of the Nationalized Bank or by a scheduled bank.

(c) Deposit receipts executed by the schedule Banks (other than the State Bank of India and the Nationalized Bank.) approved by the Reserve Bank of India for this purpose. The Railways will not, however, accept deposit receipt without getting in writing the concurrence of the Reserve Bank of India.

vii) Tender without Earnest Money: Tender(s) not accompanied full Earnest Money, in the requisite manner, as aforesaid, shall under no circumstances be entertained and will summarily be rejected at the time of opening itself without further reference to the tenderer(s).

6A. GENERAL INSTRUCTIONS FOR COMPLETING TENDER DOCUMENTS:

i. The tenderer shall submit, as his tender, all these documents intact, without severing detaching, defacing or removing any part thereof. After completing these documents, The tenderer(s) shall sign each page of these documents, before submission, intact, without severing, detaching, defacing or removing any part thereof, as per instructions contained in these documents.

ii. Tender form containing over writings, scribbling, and erased rates and/or rate-not shown in words are liable to be rejected .In case of any discrepancy in rates shown in figures and words being noticed, the accepting authority may at his discretion accept the lower of the two.

- iii. The tenderer must completely and carefully fill up the letter entitled "FORM OF TENDER" i.e. Chapter 'V' of these documents.
- iv. The Tenderer shall not leave any space blank, where he is expected to make any entry.

v. **Eligibility Criteria: Applicable for tender value above Rs.50.00 lakhs.** Wherever Eligibility Criteria is specified in the tender notice, the tenderer shall submit specific details of work executed and payment received thereof along with relevant documents which make him eligible for tendering. If the tenderer gives any wrong information or suppresses any material fact to cover his eligibility, his tender will be summarily rejected.

- vi. **False / Incomplete statement:** Any statement/declaration made by the Tenderer, if proved wrong or false or incomplete or such as to withhold any information relevant to the award of the tender, at any stage of the tender or in the event of his tender having been accepted at any stage of the contract, shall render his/their tender(s)/contract(s) liable to be cancelled/rescinded, in addition to the followings:
 - a. If such statement is found at the tender stage, his total earnest money shall be forfeited.
 - b. In case such a statement is found at the contract stage rights available to the Railways under clause 62 of the GCC-2014 shall be applicable.

vii. **Cancellation of document etc.:**

The cancellation or amendment of any documents such as power of attorney, partnership deed etc. should be forthwith communicated by the tenderer/contractor to the Railway in writing, failing which the Railway shall have no responsibility or liability for any action taken on the strength of the documents available with the Railway.

6B. Care In Submission Of Tenders :

- (a) Before submitting a tender, the tenderer 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 enters in the tender forms are adequate and all inclusive to accord with the provisions in Clause-37 of the General Conditions of Contract for the completion of works to the entire satisfaction of the Engineer.
- (b) When work is tendered for by a firm or company of contractors, the tender shall be signed by the individual legally authorized to enter into commitments on their behalf.
- (c) The Railway 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.

7A. QUOTATIONS OF RATES:

- i) The tenderer shall fill in his rates for doing this work on the prescribed page/sheet of the chapter VI of these documents. Rebate, if any should be quoted in Schedule "D" as contained in Chapter VI. Various items of the works covered under this work have been detailed in **Schedules 'A-I to C-II' which includes in chapter VI of this tender documents.** Rates shall have to be quoted as percentage above or below for each schedule separately. Tenderers must not quote item wise rates. In case any tenderer quotes unified percentage for each schedule and also quotes item wise rates against individual items, no cognizance would be taken for the item wise rates quoted by the tenderers. However, railways reserves the right to cancel any tender wherein item wise rates has been quoted.

Tenderer should quote their rate after careful study of the tender documents and site conditions, with full understanding of the implications thereof.

- ii) The Railway Administration reserves the right to modify any or all the schedules whether it is to increase or to decrease the scope of the work including / deletion of any item(s). The Tenderer shall not be entitled to any revision of rates due to such increase/decrease in quantities of items. The payment shall be made on the basis of actual quantities executed under various item(s) and the accepted rates thereof, and not on the quantities mentioned in various schedules.

iii) **FLUCTUATION IN MARKET RATES :**

The rates quoted by the Tenderer(s) and accepted by the Railway Administration shall hold good till the completion of the work and are not subjected to fluctuation(s) of any kind, save and except what is admissible under the Price Variation Clause contained in these documents.

- iv) **RATES TO INCLUDE ALL TAXES :** The rates quoted shall be inclusive of all fees duties, royalties, rent and compensation to owners for surface damages or taxes and impositions payable to local authorities in respect of land, structures and all material supplied for the work or other duties of expenses for which contractor may become liable or may be put to under any provision of law for the purpose of or in connection with the execution of the contract, and all such other incidental charges or contingencies as may have been specially provided for in the specifications.

However, change of rate of statutory taxes of the State/Central Government and levy of any new type of such statutory tax after the date of dropping of tender shall be on Railway account.

- v) The tenderer(s) should quote his single rate for each schedule taking into consideration estimated rate, quantity of each and every item of schedules, all the conditions of these documents and the Special Conditions mentioned in the various schedules. For works to be done under schedule “B”, the basic rates are those given in L&M Schedule of E.C. Railway, USSOR’2012.

vi) **RATES IN FIGURES AS WELL AS IN WORDS:**

The Tenderer(s) are required to quote their rate and all other figures, having financial implications wherever occurring in these documents, in numerals as well as in words. In case of difference between the two, the lower of the two shall be taken in to account for all-purposes connected with this tender,

7B. Two Packets System of Tendering : The procedure detailed below shall be adopted for dealing with ‘Two Pockets System’ of Tendering :

7B.1 With a view to assess the tenders technically without being influenced by the financial bids, 'Two Packets System of tendering' shall be adopted. In this system, the tenderers shall submit their quotations/offers in two sealed envelopes; with one cover containing the Technical & Commercial offers and the other cover containing the Financial Bids. The first packet shall be with the objective of scrutinizing the capability, possession of appropriate machinery & equipments, financial strength, experience etc. of the tenderers.

7B.2 The technical details and commercial conditions shall be read out before the tenderers or their representatives at the time of opening of tenders and the same shall be evaluated by the Tender Committee. If the offers are found acceptable by the competent authority (as prescribed by Railway Board from time to time for the estimated value of tender invited), the second packet shall be opened and the tenders shall be processed for finalisation in the normal manner.

7B.3 However, if on the basis of information contained in the first packet, the Tender Committee needs clarification regarding designs, specifications etc.; discussions shall be held with each individual party/tenderer after obtaining approval of the Competent Authority.

(Authority:- Rly. Bd’s letter No. 94/CE-I/CT/4/Pt.17, Dated. 13.08.2012).

8. REBATE:

- i) If any tenderer(s) wishes to give any rebate on the rates quoted by him, the same shall be quoted by him in schedule-“D” of these documents. It is to be noted that such rebate, if offered, shall apply in all the schedules (other than schedule-“D”) of these tender documents. Such a rebate shall be totally unconditional.
- ii) In case a tenderer does not wish to give any rebate, he should write NIL in the schedule “D”. In case nothing has been quoted by the tenderer in schedule-“D” and the space is left blank, it will be treated as “NIL” and shall be so recorded (in the schedule-“D”) at the time of opening of the tender.
- iii) If any tenderer(s) gives any conditional rebate, such rebate shall not be considered for evaluation of the tender, although the Railway may avail of the same in case the tender is awarded to such a tenderer(s).

9. PURCHASE PREFERENCE: Not Applicable.

10. SUBMISSION OF TENDER :

- i) Tender must be placed in sealed envelope super-scribed with the tender number, name of work and date and place of opening and should be submitted in the office of **CAO/Con/EC Rly. Mahendrughat, Patna and Dy.CE/Con/BRKA** on or before the date of opening of the tender.
- ii) Tender, sealed and super-scribed as mentioned above, can also be sent by Registered Post to the above named office, provided that, no tender received after the time and date specified above for closing of tender box, shall be considered. Railway shall not be responsible for Postal delays.
- iii) The requisite total Earnest Money as per chapter –I should be submitted in requisite manner along with the tender documents without which tender shall be summarily rejected and rates quoted will not be read out.
- iv) Late tenders / delayed tenders: Offers shall be dealt with as per extent rules of Railways, and the tenderer(s) shall have no right of consideration of such a tender (s).

11. SPECIAL CONDITIONS BY TENDERER (S)

- (i) The tenderer(s) is, normally, not expected to make any special condition / stipulation of his own and is expected to submit his tender in accordance with the conditions / stipulations contained in these documents. If, however, the tenderer (s) wishes to make any special condition/stipulations or wishes to intimate the Railway about any matter of important, he may do so in a covering letter. The accepting authority reserves the right to or, not to accept any such special stipulations and conditions made by the tenderer and may reject the tender(s) as unacceptable without any reference to the tenderer(s) or may ask the tenderer to withdraw any or all such stipulations before awarding the contract and in the event of his refusals to do so, may not accept his tender.
- (ii) In case, any special conditions and/or stipulations are made by the tenderer, he shall also indicate, along with such conditions/stipulations, the cost of withdrawal of the same. The accepting authority reserves the right, either to accept the conditions/stipulations made by the tenderer or the cost thereof, at its sole discretion. If such cost is not indicated, it will be construed that the tenderer(s) is not in a position to withdraw these conditions at any cost and tender may be adjudged accordingly without any reference to tenderer(s).

The detail shall be furnished in performa given in Annexure VIII.

- 12. OPENING OF TENDER:**
Tenders will be opened in public at the scheduled time and place. The date and time of opening may be postponed at the sole discretion of the Railway, if circumstances so warrant. Tenderer(s) or their authorized representatives are allowed to participate in the opening. They shall sign the statement prepared as a result of witnessing of opening of tender(s).
- 13. CLARIFICATION OF BIDS SUBMITTED:**
To assist in the examination, evaluation and comparison of tenders, the Railway or its authorized person may ask the tenderer(s) for clarification(s), if any needed, for such examination, evaluation and comparison. The request for such clarification etc and the response thereof shall be in writing. Railway may conduct a pre-bid meeting/conference for clarifications and obtaining suggestions from prospective tenderers for which, date and venue shall be notified.
- i). INSPECTION OF DATA:**
Copies of drawing and other information for the work, relevant to this tender, may be inspected in the office of the Chief Admin. Officer (Con) / East Central Railway, Mahendrugat, Patna 800 004 or **Dy.Chief Engineer (Con)/BRKA, East Central Railway**, on any working day during office hours.
- ii) INSPECTION OF SITE:**
Tenderer must acquaint himself, at his own responsibility, risk and expense, with all information of the site(s) of work(s) and their neighborhoods, actual working and other prevalent conditions, laws/regulations, availability and suitability of local labourers, materials, surface and sub soil condition, accessibility of site(s) of work(s) sources and availability of water, electricity, camp site, market, banking facilities etc. and all such possible factors as have bearing on rates and progress of the work under this tender and should be taken all this factors into consideration before submitting this tender.
- 14. PERIOD OF VALIDITY OF TENDER:**
The Tenderer(s) shall keep the offer open for a minimum period as stated in Chapter- I from the date of opening of the tender within which the Tenderer(s) cannot withdraw or modify his offer. The Railway Administration may request the Tenderer(s) to extend the validity. The earnest money referred to in this chapter is for the performance of the stipulation to keep the tender open for the aforesaid period. It shall be understood that the tender documents have been issued to the Tenderer(s) and the Tenderer(s) is permitted participate in the tender in consideration of the stipulation on his part that after submitting his tender, he will not resale from his offer or modify the same in any manner not acceptable to the Railway within the period of validity. Should the Tenderer fail to observe or comply with this stipulation; the Railways shall forfeit the full amount of Earnest Money.
- 15. TENDERER'S POSTAL ADDRESS:**
- i)** Every tenderer shall state in the tender, his complete postal address, E-Mail ID, name and contact numbers of key personnel's fully and clearly in Chapter - V- "Form of Tenders". Any communication sent in time to the Tenderer by post at the said address shall be deemed to have reached the Tenderer duly and in time. Important documents shall be sent by Registered post.
- ii) CHANGE OF ADDRESS:** The Tenderer must keep the Railway informed of any change of address during the currency of tender of work in his own interest.
- 15A. Partnership Deeds, Power Of Attorney Etc.:**
- (i)** The tenderer shall clearly specify whether the tender is submitted on his own or on behalf of a partnership Firm/Joint Venture (JV)/Society etc. The tenderer(s) who is/are constituents of Firm, Company. Associated or Society shall enclose self-attested copies of the Constitution of their concern, Partnership Deed and Power of Attorney along with their tender. Tender documents in such cases shall to be signed by such persons as may be legally company, Association or Society, as the case may be.
- (ii)** The tenderer shall give full details of the Constitution of the Firm/JV/Company/Society etc. and shall also submit following documents (as applicable), in addition to documents mentioned above:
- (a) Sole Proprietorship Firm:** The tenderer shall submit the notarized copy of the affidavit.
- (b) Partnership Firm:** The tenderer shall submit self-attested copies of (i) registered/notarized Partnership Deed and (ii) Power of Attorney duly authorizing one or more of the partners of the firm or any other person(s), authorized by all the partners to act on behalf of the firm and to submit & sign the tender, sign the agreement, witness measurements, sign the Measurement Books, receive payment, make correspondences, compromise/settle/relinquish any claim(s) preferred by the firm sign 'No Claim Certificate', refer all or any dispute to arbitration and to take similar action in respect of all tenders/contracts OR said tender/contract.
- (c) Joint Venture (JV):** The tenderer shall submit documents as mentioned in Clause 65 of GCC.
- (d) Company registered under Companies Act-1956:** The tenderer shall submit (i) the copies of MOA (Memorandum of Association) and AOA (Article of Association) of the Company and (ii) Power of Attorney duly registered/notarized by the company (backed by the resolution of Board of Directors) in favour of the individual, signing the tender on behalf of the Company.
- (e)** The tenderer shall submit (i) Self attested copy of the certificate of registration (ii) Deed of formation and (iii) Power of Attorney in f/o the tender signatory.

- (iii) It is mentioned in the tender that it is being submitted on behalf of/by a Sole Proprietorship Firm/Partnership Firm/Joint Venture/Registered Company etc. but above mentioned document/s (as applicable) are not enclosed along with tender, the tender shall be summarily rejected.
If it is NOT mentioned in the tender that it is being submitted on behalf of / by a Sole Proprietorship Firm/Partnership Firm/Joint Venture/Registered Company etc. then the tender shall be treated as having been submitted by the individual who has signed the tender.
After opening of the tender, any document pertaining to the constitution of the Firm/JV/Society etc. shall neither be asked nor be entertained/considered.
- (iv) A tender from JV/Consortium/Partnership Firm etc. shall be considered only where permissible as per the tender conditions.
- (v) The Railway will not be bound by any power of attorney granted by the tendere or by changes in the composition of the firm made subsequent to the submission of tender. It may, however, recongnize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor.

16. The tenderer whether sole proprietor, a limited company or a partnership firm if they want to act through agent or individual partner(s) should submit along with the tender or at a later stage, a power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of the firm or any other person specifically authorizing him/them to submit the tender, sign the agreement, receive money, witness measurements, sign measurement books, compromise, settle, relinquish any claim(s) preferred by the firm and sign "No Claim Certificate" and refer all or any disputes to arbitration.

16A. TENDERS TO BE SIGNED BY AUTHORISED PERSONS:

- i). The Tender shall be signed by individual or individuals legally authorized to enter into commitments on Behalf of the Tenderer(s). Any individual or individuals signing the tender documents or other documents Connected there with, should specify whether he is signing the said documents:-
- a) As a Sole Proprietor of the firm or Attorney of the Sole proprietor.
Or
- b) As an authorized Partner of partnership firm
Or
- c) As a Director, manager or secretary in a Limited company (duly authorized by a resolution passed by the board of directors or in presence of the authority conferred by the memorandum of association).
- d) In case of **Joint Ventures/Consortium:** all the constituents or the attorney duly authorized by all of them.
- ii) In the case of a firm not registered under the Indian partnership act, all the partners or the attorney duly authorized by all of them, should sign the tender documents and all other concerned documents.
- iii) Requisite power of attorney or such other documents empowering the individual or the individuals to sign the Tender document should be furnished in original, along with the Tender.
- iv) The Railway shall 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 agreement. It may, however, recognize such Power of Attorney and changes, after obtaining legal advice to the satisfaction of the Railway, the cost of which will be borne by the Tenderer.

17. CONDITIONS FOR PARTICIPATION OF JOINT VENTURE FIRMS IN WORKS TENDER FOR TENDERS OF VALUE MORE THAN 10 CRORE

- 17.1 Separate identity/name shall be given to the joint venture firm.
- 17.2 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 be not be more than five if the work involves more than one department.
- 17.3 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.
- 17.4 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
- 17.5 **The Joint Venture firm shall be required to submit Earnest Money Deposit (EMD) along with the tender in terms of the provisions contained in Para-5 (c) of Chapter-III (Condition of Tenders and instruction to tenderer(s))**
- 17.6 One of the member of the JV firm shall be its lead members who shall have a majority (at least 51%) share of interest in the JV firm and also, must have satisfactorily completed in the last three previous financial years and the current financial year upto the date of opening of the tender, one similar single work for a minimum value of 35% of advertised tender value. 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%.

- 17.7 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 railway in consultation with their law branch and shall be enclosed along with the tender).
- 17.8 Once the tender is submitted, the MOU shall not be modified/alterd/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.
- 17.9 Approval for change of constitution of JV firm shall be at the sole discretion of Employer (Railways). 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.
- 17.10 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.
- 17.11 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 guarantee like Performance Guarantee, Bank Guarantee for Mobilization advance, Machinery advance etc. shall be accepted only in the name of JV firm and no splitting of guarantees amongst the members of the JV firm shall be permitted.
- 17.12 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 Railways 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:
- 17.12.1 Joint and several liability – The members of the JV firm to which the contract is awarded, shall be jointly and severally liable to the Employer (Railways) for execution of the project in accordance with General and Special Conditions of the 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 contract or part thereof.
- 17.12.2 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.
- 17.12.3 Governing laws – The joint venture agreement shall in all respect be governed by and interpreted in accordance with Indian Laws.
- 17.13 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 authorized member of the JV firm.
- 17.14 No members of the Joint Venture 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 (Railways) in respect of the said tender/contract.
- 17.15 Documents to be enclosed by the JV firm along with the tender.
- 17.15.1 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.
- 17.15.2 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/she concern is a Proprietary Concern and he/she is sole proprietor of the Concern or he 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.
- 17.15.3 In case one or more members is/are limited companies the following documents shall be submitted :

1. Notary certified copy of resolution 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.
 2. Copy of Memorandum and articles of Association of the company.
 3. Power of Attorney (duly registered as per prevailing law) by the company authorizing the person to do/act mentioned in the Para (a) above.
- 17.15.4 All the members of the JV shall certify that they are not black listed or debarred by Railways or any other Ministry/Department/PSU (Public sector or 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 members of the JV firm or JV firm in which they were/are members.
- 17.16 Credentials & Qualifying criteria : Technical and financial eligibility of the JV firm shall be adjudged based on satisfactory fulfillment of the following criteria:
- 17.16.1 Technical eligibility criteria:(a or b mentioned hereunder):-
- (a) Either the JV firm or Lead member of the JV firm must have satisfactory completed in the last three previous financial years and the current financial year up to date of opening of the tender, one similar single work for a minimum of 35% of advertised value of the tender.
- 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 and superstructure etc.), for each component, at least 35% of the value of any of such component individually for single similar nature of work should have been satisfactorily completed by the JV Firm or by any member of the JV Firm in the previous three financial years and the current financial year up to 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 a minimum of 35% of the advertised value of the tender for the same value of the component, and resultantly, all the members of 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 of the above mentioned technical eligibility criteria in the tender under consideration.
- 17.16.2 Financial eligibility criteria: The contractual payments received by the JV firm or the arithmetic sum of contractual payments received by all the members of JV firm in the previous three financial years and the current financial year up to the date of opening of tender 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.
- (Authority:- Rly. Bd's letter No. 2002/CE-I/CT/37, Dated. 07.09.2011).**
- 18. EX. RAILWAY OFFICERS AS TENDERER (S):** Should a Tenderer be, himself, a retired employee having held a Gazetted rank in any of the Railways, owned and administered by the President of India, or should a Tenderer, being a partnership firm, have, as one or more of its partners, such retired employee(s) as aforesaid, or, should the Tenderer being an incorporate company, have any such person(s) as aforesaid, as sits Director(s), or, should the tenderer have, in his employment, any person(s), as aforesaid, full information of such person(s) shall be submitted in Annexure – III to this Chapter of these Tender documents. Further, in cases, where such a person(s), as aforesaid, has retired from the Railway service within two years of the date of opening of the Tender, the Tenderer(s) shall furnish a copy of the permission of the President of India, permitting such a person(s), as aforesaid, to associate himself with the Tenderer(s), in any of the capacity as aforesaid, in the aforesaid Annexure-III
- i) **TENDERER (S) RELATIVE EMPLOYED AS GAZETTED OFFICER**
In case of a Tenderer(s) being an individual having a relative(s) employed in any Gazetted capacity in the East Central Railway or in the case of partnership firm/or company incorporated under the Indian Company law, should any partner(s) /Director(s) or relatives of the partner(s) / Director(s) or share holder (s), be employed in any Gazetted capacity in the East Central Railway, detailed information about such Gazetted employee(s) shall also be furnished in the aforesaid Annexure III of Chapter-III.

19. TESTIMONIALS:

- i. The tenderer(s) shall submit along with the tender(s), the particulars of all works awarded or taken up by him for execution during the 3 years preceding the date of opening of this tender, irrespective of whether the same have been completed or are still continuing or were terminated, in the Performa enclosed as Annexure-I to this Chapter.
- ii. The figures of cost indicated in the Performa at Annexure-I will not include the cost of materials supplied free of cost by the client to contractor.
- iii. The said Performa should be filled up by the tenderer in respect of all the works done by him, whether for the Railways or for any other client.
- iv. The tenderer shall submit photocopies of certificates and testimonials from the clients/departments to establish the correctness of the data given by him in the aforesaid Performa, and also certificates certifying satisfactory Performance and completion of works. The Railway reserves the right to verify the correctness of such data in such a manner they considered fit and appropriate.
- v. The details of contractual receipts shall be filled in Performa as per annexure –II.
- vi. The tenderer(s) shall also enclose bank certificates showing the financial stability to undertake work of such magnitude as is covered by this tender.
- vii. The tenderer(s) shall also submit a list of court cases filed and number of arbitration cases in progress as demanded by him from the Railway or other clients during the 5 years preceding the date of opening of this tender as per Annexure-IV & V of Chapter-III. In the event of the tenderer not giving this information the railway shall compile such data in the said format from available records and the tenderer(s) shall have no right to question the correctness or completeness of such data and Railways may not consider the offer itself as it will amount to incompletely filled tender form.

20. LIST OF EQUIPMENTS/TOOLS, TECHNICAL PERSONNELS:

The tenderer(s) shall submit list of equipments/tools with him and the list of technical personals in Performa given in Annexure-VI & VII of Chapter-III. The tenderer(s) should also submit a specific detail along with tender indicating list of personnel and plant and machinery (owned and hired separately) proposed to be deployed for the subject work. The tenderer(s) without this information may be treated as if the tenderer(s) has no organization and no equipments and tender will be judged accordingly.

21. SALES TAX CLEARANCE CERTIFICATE:

Tender should be accompanied by the up to date Sales Tax Clearance Certificate in Form XXXVIII or any other appropriate stipulated format, issued by the appropriate Commercial Tax Officer in favour of the Company, the firm or the tenderer(s) as the case may be, in respect of all works contract or purchase contract to be executed in West Bengal, Bihar, Jharkhand, U.P. and M.P. area. Tender without such certificate may not be considered, and if at all considered, it will be necessary to produce such certificate before any payment is made for executed works and the Contractor shall have no claim in this regard for non-payment for works done in absence of a certificate. Sales tax may be recovered from contractors running bills.

22. NEGOTIATION:

- i) The accepting authority reserve the right to enter into negotiations with the L-1 or more (in special case) tenderer(s) before acceptance of the tender in order to clarify special conditions or reduction of rates, or, for changes in scope of the work etc, at its sole discretion.
- ii) L-1 should be defined as the lowest, valid, eligible and technically acceptable tenderer.
- iii) In tenders, providing the “ purchase preference” in favour of PSUs, if the quoted rates of L-1 are considered high and negotiation are resorted to, such negotiation may be held with the original L-1 as also the lowest PSU whose original offer is not higher by more than 10% of the original L-1. Provision of Purchase preference in terms of PSUs will be applicable on negotiated offer.
- iv) Should such negotiation with the tenderer(s) be entered into, the tenderer(s) shall not be permitted to increase their quoted rates under any circumstances, even if it includes withdrawal / modification of such special conditions as are given by the tenderer(s) along with their original tender.

23. ACCEPTANCE OF TENDER:

- i) 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.
- ii) The accepting authority reserves the right to split up the work without reference to the tenderer(s) and may accept the tender in respect of any portion of the work.

24. LETTER OF ACCEPTANCE:

- i.) The acceptance of the tender shall be communicated by Registered Post with A/D at the address given by the Tenderer in these tender documents. The letter of acceptance will remain operative till a formal Contract / Agreement is executed and signed by and between the Contractor and competent officer of the

Railway, for and on behalf of the President of India, after which the letter of acceptance will merge in the said formal agreement.

- ii) The Railway shall not intimate to the tenderer(s) whose tenders have not been accepted and the result of their tender(s). However, Earnest Money will be refunded as per clause 5(iv) above.

25. AGREEMENT:

- (i) The Railway shall prepare the agreement and intimate the contractor of its preparations whereupon the contractor shall sign the same within seven days of the receipt of the intimation.
- (ii) The agreement can be drawn only after the contractor deposits the requisite amount of Performance Guarantee (P.G) in the requisite form as mentioned vide item No. 28(b) of this chapter.
- (iii) This contract agreement shall be entered into by the Railway with the Contractor(s) on the explicit understanding that the contractor(s) shall abide by all the conditions of these documents and that their implications had been fully understood by the contractor before tendering for this work.
- (iv) A photo copy of PAN card issued by Income Tax Department in the name of firm/contractual agency in any form (viz. individual, proprietorship, JV/Consortium etc) should be submitted at the time of entering into agreement with the Railway.

26. SECURITY DEPOSIT BY CONTRACTOR

- i) The Contractor shall furnish total Security Deposit including initial security deposit, at the rate mentioned in clause 16(2) of the GCC:-2014 which shall be 5% of the contract value.
- ii. The total Earnest Money of the tenderer shall be adjusted to Initial Security Deposit which will merge with the total Security Deposit. Remaining Security Deposit/rate shall be recovered as under:-
- (a) The rate of recovery shall be at the rate of 10% of the bill amount till the full security deposit is recovered.
- (b) For works contract of value less than Rs. 50.00(Fifty) Crore :- 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.
- (c) For works contract of value equal to or more than Rs. 50.00(Fifty) Crore:- Security Deposits may be accepted in form of irrevocable Bank Guarantee, however in case of risk and cost tenders Security Deposit shall be recovered only from running bills.(**Note:- SD will not be deducted from RA bills provided prior Bank Guarantee Bond equivalent to requisite SD is submitted. However, refund of SD once deducted from RA bills shall not be made against submission of equivalent BG Bond at later/subsequent stage).**)

27. Penalty for failure of Railway PSUs : Not Applicable

In the event of the failure of the Railway PSU to successfully execute the contract as per terms & conditions laid down in the agreement, a penalty equivalent to 5% of the original value of contract would be levied.

28. Performance Guarantee (P.G)

(a) The successful bidder shall have to submit a Performance Guarantee (PG) within 30 (thirty) days from the date of issue of Letter of Acceptance (LOA). Extension of time for submission of PG beyond 30 (thirty) days and upto 60 days from the date of issue of LOA may be given by the Authority who is competent to sign the contract agreement. However, a penal interest of 15% per annum shall be charged for the delay beyond 30 (thirty) days, i.e. from 31st day after the date of issue of LOA. In case the contractor fails to submit the requisite PG even after 60 days from the date of issue of LOA, the contract shall be terminated duly forfeiting EMD and other dues, if any payable against that contract. The failed contractor shall be debarred from participating in re-tender for that work.

(b)The successful bidder shall submit the Performance Guarantee (PG) in any of the following forms, amounting to 5% of the contract value:(In case of Risk and Cost tenders the failed contractor/JV who's any partner is the failed contractor will have to submit Performance Guarantee amounting to 10% of the contract value.)

- (i) A deposit of Cash;
- (ii) Irrevocable Bank Guarantee;
- (iii) Government Securities including State Loan Bonds at 5% below the market value;
- (iv) Deposit Receipts, Pay Orders, Demand Drafts and Guarantee Bonds. These forms of Performance Guarantee could be either of the State Bank of India or of any of the Nationalized Banks;
- (v) Guarantee Bonds executed or Deposits Receipts tendered by all Scheduled Banks;
- (vi) A Deposit in the Post Office Saving Bank;
- (vii) A Deposit in the National Savings Certificates;
- (viii) Twelve years National Defence Certificates;
- (ix) Ten years Defence Deposits;
- (x) National Defence Bonds and
- (xi) Unit Trust Certificates at 5%below market value or at the face value whichever is less. Also, FDR in favour of FA&CAO(free from any encumbrance) may be accepted.

NOTE: The instruments as listed above will also be acceptable for Guarantees in case of Mobilization Advance.

(c) The Performance Guarantee shall be submitted by the successful bidder after the Letter Of Acceptance (LOA) has been issued, as stated (a) above. This 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) The value of PG to be submitted by the contractor will not change for variation upto 25% (either increase or decrease). In case during the course of execution, value of the contract increases by more than 25% of the original contract value, an additional Performance Guarantee amounting to 5%(five percent) for the excess value over the original contract value shall be deposited by the contractor."

(e) The Performance Guarantee (PG) shall be released after physical completion of the work 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 and after passing the final bill based on 'No Claim Certificate' from the contractor.

(f) 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 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.

(g) The engineer shall not make a claim under the Performance Guarantee except for amounts to which the President of India is entitled under the contract (not withstanding and/or without prejudice to any other provisions

in the contract agreement) in the event of :

(i) Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer may claim the full amount of the Performance Guarantee.

(ii) Failure by the contractor to pay President of India 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 Engineer.

(iii) The Contract being determined or rescinded under provision of the GCC, the Performance Guarantee shall be forfeited in full and shall be absolutely at the disposal of the President of India.

Pro-forma for Bank Guarantee Bond is available at Annexure XI of Chapter-III.

29. **REFUND OF SECURITY DEPOSIT**

Security Deposit shall be released after the physical completion of the work and the expiry of the maintenance period and after processing of the final bill based on "No claim certificate". The Competent Authority to release security deposit shall normally be the authority who is competent to sign the contract if this Competent Authority is of the rank lower than JA Grade, 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 contractors and that there is no due from the contractor to Railways against the contract concerned. Before releasing the SD, an unconditional and unequivocal no claim certificate from the contractor concerned should be obtained.

For works which have been physically completed but maintenance period is not over: Security Deposit recovered from the running bills of the contractors can be returned to the contractor if he so desires, in lieu of FDR/Irrecoverable bank Guarantee for equivalent amount to be submitted by him after the physical completion of the work as certified by the Competent Authority. This bank guarantee shall be initially valid up to the stipulated maintenance period plus 60 (Sixty) days beyond that. In case, maintenance period gets extended, the contractor shall get the validity of guarantee bond extended to cover such extended maintenance period plus 60 (Sixty) days. 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, then a JA Grade Officer (concerned with the work) should issue the certificate.

No interest will be payable on the Security Deposit.

30. **REFUND OF Performance Guarantee (P.G)**

The Performance Guarantee (P.G) shall be released after satisfactory completion of work based on the 'Completion Certificate' as issued 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, and 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 respect and that all the contractual obligations have been fulfilled by the contractors and that there is no due from the contractor to Railways against the contract concerned. Before releasing the Performance Guarantee (P.G), an unconditional and unequivocal no claim certificate from the contractor concerned shall be obtained.

No interest will be payable on the Performance Guarantee (P.G).

31. SCOPE OF WORK & PAYMENTS THEREOF:

- (i) The Railway reserves the right to get the work executed in the best and most economical manner, and may add or may not operate any item(s) of work(s) as the Railway may consider fit.
- (ii) The Contractor(s) is expected to use the latest technology and machinery and achieve a most efficient and best quality finished construction.
- (iii) The Railway reserves the right to increase or decrease the scope of work and/or not to operate any one or more of the item(s) or work(s) of any one or more of the various Schedules. It is the responsibility of the Contractor to ascertain from the Engineer-in charge, the items to be operated with their actual quantities before making any arrangements(s) for taking up work under the item(s). No claim, whatsoever, from the Contractor will be entertained for non-operation of any of the item(s) or for variation in quantity of any of the item(s).
- (iv) The payment shall be made on the basis of actual quantities executed under various item(s) and the accepted rates thereof, and not on the quantities mentioned in the various schedules.
- (v) **Terms & Conditions of payment through ECS/EFT**
 - i) Tenderer to give consent in a mandate form for receipt of payment through ECS/EFT.
 - ii) Tenderer to provide the details of Bank A/c in line with RBI guidelines for the same. These details will include Bank Name, Branch Name & Address, Account type, Bank A/c No. and Bank & Branch Code as appearing on MICR cheque issued by bank.
 - iii) Tenderer to attach certificate from their bank certifying the correctness of all above mentioned information (as mentioned in Para (ii) above)
 - iv) In case of non-payment through ECS/EFT or where ECS/EFT facility is not available, payment will be released through cheque.

32. VARIATION BEYOND +25% OVER AGREEMENTAL QUANTITY & ITS PAYMENT

- 32.1. Modification To Contract To Be In Writing: In the event of any of the provisions of the contract requiring to be modified after the contract documents have been signed, the modifications shall be made in writing and signed by the Railway and the Contractor and no work shall proceed under such modifications until this has been done. Any verbal or written arrangement abandoning, modifying, extending, reducing or supplementing the contract or any of the terms thereof shall be deemed conditional and shall not be binding on the Railway unless and until the same is incorporated in a formal instrument and signed by the Railway and the Contractor, and till then the Railway shall have the right to repudiate such arrangements.
- 32.2. Powers of Modification To Contract : The Engineer on behalf of the Railway shall be entitled by order in writing to enlarge or extend, diminish or reduce the works or make any alterations in their design, character position, site, quantities, dimensions or in the method of their execution or in the combination and use of materials for the execution thereof or to order any additional work to be done or any works not to be done and the contractor will not be entitled, to any compensation for any increase/reduction in the quantities of work but will be paid only for the actual amount of work done and for approved materials supplied against a specific order.
- 32.3.(i) Unless otherwise specified in the special conditions of the contract, the accepted variation in quantity of each individual item of the contract would be upto 25% of the quantity originally contracted, except in case of foundation work. The contractor shall be bound to carry out the work at the agreed rates and shall not be entitled to any claim or any compensation whatsoever upto the limit of 25% variation in quantity of individual item of works.
 - (ii) In case of earthwork, the variation limit of 25% shall apply to the gross quantity of earth work and variation in the quantities of individual classifications of soil shall not be subject to this limit.
 - (iii) In case of foundation work, no variation limit shall apply and the work shall be carried out by the contractor on agreed rates irrespective of any variation.
- 32.4. Valuation Of Variations : The enlargements, extensions, diminution, reduction, alterations or additions referred to in Sub-Clause (2) of this Clause shall in no degree affect the validity of the contract; but shall be performed by the Contractor as provided therein and be subject to the same conditions, stipulations and obligations as if they had been originally and expressively included and provided for in the Specifications and Drawings and the amounts to be paid there for shall be calculated in accordance with the accepted Schedule of Rates. Any extra items/quantities of work falling outside the purview of the provisions of Sub-Clause (2) above shall be paid for at the rates determined under Clause-39 of these Conditions.
- 32.5.
 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. For this, no finance concurrence would be required.
 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:

- (a) Operation of an item by more than 125% of the agreement quantity needs the approval of an officer of the rank not less than S.A. Grade;
- (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 associate finance and shall be paid at 96% of the rate awarded for that item in that particular 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 personal concurrence of FA&CAO/ FA&CAO(C) and approval of General Manager.
3. In cases where decrease is involved during execution of contract: The contract signing authority can decrease the items upto 25% of individual item without finance concurrence.
- (b) For decrease beyond 25% for individual items or 25% of contract agreement value, the approval of an officer not less than rank of S.A. Grade may be taken, after obtaining 'No Claim Certificate' from the contractor and with finance concurrence, giving detailed reasons for each such decrease in the quantities.
- (c) It should be certified that the work proposed to be reduced will not be required in the same work.
4. 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.
5. No such quantity variation limit shall apply for foundation items.
6. 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).
- 7 For the tenders accepted at Zonal Railways level, variations in the quantities will be approved by the authority in whose powers revised value of the agreement lies.
8. For tenders accepted by General Manager, variations up to 125% of the original agreement value may be accepted by General Manager.
9. For tenders accepted by Board Members and Railway Ministers, variations upto 110% of the original agreement value may be accepted by General Manager.
10. The aspect of vitiation of tender with respect to variation in quantities should be checked and avoided. In case of vitiation of the tender (both for increase as well as decrease of value of contract agreement), sanction of the competent authority as per single tender should be obtained.
- No Claim certificate for variation in quantities more than 25% is to be submitted by the contractor i.e. I/We are ready to execute the quantity of item exceeded more than 25% of the agreemental quantity of items and I/We have no claim for the exceeded quantity to the railway.

33. RECOVERY OF INCOME TAX

Income Tax as per prevailing rate will be recovered of the gross amount of the each bill from all the bills of the contractor as per Income Tax Act, as introduced through the Finance Act-1972. A surcharge as per prevailing rate on the amount of Income Tax so deducted will also be recovered from the contractor's bills. This is further subject for increase or decrease as per extant instructions in this regard.

34.(A) RECOVERY OF SALES TAX:

For the work executed in the State of Bihar, Jharkhand, MP and UP, Sales Tax on Works Contract will be recovered at the source from the Gross amount of each bill of the contractor as applicable This is further subject to increase or decrease as per extant instructions/Act/ Rules in this regard.

34.(B) NEW STATUTORY TAXES:

Extra/additional statutory taxes if any, is levied subsequent to the date of opening/negotiation of tender may be reimbursed on submission of proof of document depositing such taxes to the concerned States Govt. or Central Govt.

35. Price Variation Clause (PVC):

General:

- (i) **Price variation clause (PVC) shall be applicable only for contracts of value (Original contract Agreement value) Rs.50.00 lakh and more, irrespective of the contract completion period.**
- (ii) **PVC is not applicable to the extra items (NS/USSOR) added/included during the progress of work.**
- (iii) Materials supplied free of cost by Railway to the contractors shall fall outside the purview of Price Variation Clause. It, in any case, accepted offer includes some specific payment to be made to consultants or some materials supplied by Railway 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.

2. **Base Month:** 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.
3. **Validity:** Rates accepted by Railway 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.
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.
5. Components of various items in a contract on which variation in prices be admissible, shall be Material, Labour, Fuel, Explosives, Detonators, Steel, Cement & Lime, Concreting, Ferrous, Non-ferrous, Insulator, Zinc, Erection etc. However, for fixed components, no price variation shall be admissible.
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 Components	50%	Other Material Components	15%
Fuel Components	20%	Fixed Components *	15%
(B) Ballast and Quarry Products Contracts:			
Labour Components	55%	Other Material Components	15%
Fuel Components	15%	Fixed Components *	15%
(C) Tunnelling Contracts:			
Labour Components	45%	Detonators Components	5%
Fuel Components	15%	Other Material Components	5%
Explosive Components	15%	Fixed Components *	15%
(D) Other Works Contracts:			
Labour Components	30%	Fuel Components	15%
Material Components	40%	Fixed Components *	15%

* It shall not be considered for any price variation.

- 7 **Formulae:** The Amount of variation in prices in several components (labour material etc.) shall be worked out by the following formulae:

$$(i) \quad L = \frac{W \times (L_Q - L_B)}{L_B} \times \frac{L_C}{100}$$

$$(ii) \quad M = \frac{W \times (M_Q - M_B)}{M_B} \times \frac{M_C}{100}$$

$$(iii) \quad F = \frac{W \times (F_Q - F_B)}{F_B} \times \frac{F_C}{100}$$

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

$$(v) \quad D = \frac{W \times (D_Q - D_B)}{D_B} \times \frac{D_C}{100}$$

$$(vi) \quad S = S_W \times (S_Q - S_B)$$

$$(vii) \quad C = C_Y \times (C_Q - C_B) / C_B$$

Where,

- L Amount of price variation in Labour
M Amount of price variation in Materials
F Amount of price variation in Fuel
E Amount of price variation in Explosives
D Amount of price variation in Detonators
S Amount of price variation in Steel
C Amount of price variation in Cement
T Amount of price variation in Concreting
R Amount of price variation in Ferrous Items

N	Amount of price variation in Non-Ferrous Items
Z	Amount of price variation in Zinc
I	Amount of price variation in Insulator
L _C	% of Labour Component
M _C	% of Material Component
F _C	% of Fuel Component
E _C	% of Explosive Component
D _C	% of Detonators Component
T _C	% of Concreting Component
R _C	% of Ferrous Component
N _C	% of Non-Ferrous Component
Z _C	% of Zinc Component
W	Gross value of work done by contractor as per on-account bill(s), excluding cost of materials supplied by Railway at fixed price, minus the price values of cement and steel. This will also exclude specific payment, if any, to be made to the consultants engaged by contractors (such payment shall be indicated in the contractor's offer)
L _B	Consumer Price Index Number for Industrial Workers - All India : Published in R.B.I. Bulletin for the base period.
L _Q	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
M _B	Index Number of Wholesale Prices – By Groups and Sub-Groups : All commodities – as published in the R.B.I. Bulletin for the base period
M _Q	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.
F _B	Index Number of Wholesale Prices – By Groups and Sub-Groups for Fuel and Power as published in the R.B.I. Bulletin for the base period.
F _Q	Index Number of Wholesale Prices – By Groups and Sub-Groups for Fuel and Power as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration.
E _B	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 _Q	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.
D _B	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 _Q	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.
S _W	Weight of steel in tonne, supplied by the contractor as per the 'on-account' bill for the month under consideration.
S _Q	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 by the contractor, whichever is lower. In case, there is no notification by SAIL for the month under consideration, the price of steel, as notified in the last available month shall be taken.
S _B	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. In case, there is no notification by SAIL for the month under consideration, the price of steel, as notified in the last available month shall be taken.
C _V	Value of Cement supplied by Contractor as per on account bill in the quarter under consideration.
C _B	Index No. of Wholesale Price of sub-group (of Cement & Lime) as published in RBI Bulletin for the base period
C _Q	Index No. of Wholesale Price of sub-group (of Cement & Lime) as published in RBI Bulletin for the average price index of the 3 months of the quarter under consideration.
C _S	RBI wholesale price index for cement & lime for the month which is six months prior to date of casting of foundation.
C _O	RBI wholesale price index for cement & lime for the month which is one month prior to date of opening of tender
R _T	IEEMA price index for Iron & Steel for the month which is two months prior to date of inspection of material.

- R_O IEEMA price index for Iron & Steel for the month which is one month prior to date of opening of tender.
P_T IEEMA price for Copper wire bar for the month which is two months prior to date of inspection of material.
P_O IEEMA price for Copper wire bar for the month which is one month prior to date of opening of tender.
Z_T IEEMA price for Zinc for the month which is two months prior to date of inspection of material.
Z_O IEEMA price for Zinc for the month which is one month prior to date of opening of tender.
I_T RBI wholesale price index for Structural Clay Products for the month which is two months prior to date of inspection of material.
I_O RBI wholesale price index for Structural Clay Products for the month which is one month prior to date of opening of tender.

{**Authority: Railway Board's letters no. 2007/CE-I/CT/18/Pt.19 Dt. 14.12.2012**}

- 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.
- 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 Works	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 sized of angles	Angle 65 × 65 × 6 mm IS 2062 E250A SK
3	All types and sized of plates	PM Plates above 10-20 mm IS 2062 E250A SK
4	All types and sized of channels and joists	Channel 200 × 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.

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

The price adjustment as worked out above, i.e. either increase or decrease shall be applicable upto 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: 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.

36. **EXTENSION OF COMPLETION DATE:**

- (i) Extension of time for the completion of the work shall be governed by Clause 17 of the GCC 2014, and Para 1266-E 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 under clause 4 of chapter-IV of tender document, giving reasons for slippage activity-wise. The Railway may agree to such extension of time of completion, if they consider justified.
- (ii) The competent authority while granting extension to the currency of the contract under clause 17(B) of GCC 2014 may also consider levy of token penalty as deemed fit based on the merit of case.

37(A) **Payment of advances to contractors:**

- (b) **General:** The applicability of this clause to this tender is subject to high value of tenders of value **Rs.25.00(Twenty Five) crore** and above each as mentioned in Chapter –I of these documents. The Railway may consider sanction of the advances to the contractors vide sub-clause (b) & (c) only for works of high value of Rs. **25.00(Twenty Five) crore** and above each provided further that **the contractor has made a request with adequate justification for such advance(s) along with his tender. Request for grant of such advance shall not be entertained, if the same is made at any subsequent point of time.**
- (b) **Mobilization Advance:**
This shall be limited to 10% of the contract value and payable in 2 stages, as indicated below:

State I – 5% of contract value on signing of the contract agreement.

Stage II– 5% on mobilization of site-establishment, setting up offices, bringing in equipment and actual commencement of work.

The two stages of advances shall be payable immediately after signing of contract documents and at the time of mobilization respectively.

(c) **Advance against Machinery and equipment:**

The advance shall be limited to a maximum of 10% of the contract value against new Machinery & Equipment, involving substantial outlay, brought to site and essentially required for the work. This advance shall not exceed 75% of the purchase price of such Equipment and shall be payable when hypothecated to the President of India by a suitable bond or alternatively covered by an irrevocable Bank Guarantee for full cost of the Plant & Equipment from a Nationalized Bank in India or the State Bank of India in a form acceptable to Railways. The Plant & Equipment shall be insured for the full value and for the entire period, they are required for the work. This plant & Equipment shall not be removed from the site of work without prior written permission of the Engineer. No. advance should be given against old Plant & Machinery.

(d) **Advance For Accelerating Progress Of The Work During Course Of Execution Of Contract:-**

The advance is to be decided on the merits of each case for contract lying within the powers of General Manager (upto Rs. 100 crore or less or as decided & circulated by Board from time to time) and shall be restricted to a maximum of 5% of contract value or Rs. 1 Crore whichever is less. This is to be granted by the General Manager on the recommendations of the Chief Engineer in-charge in consultation with the Associate Finance.

(e) **Advance in Exceptional Cases:-**

General Manager are further empowered to grant advances in exceptional cases upto a maximum of Rs. 5 lacs in respect of even contracts of value of less than Rs. 50 lacs, if considered absolutely essential, depending on the merits of each case and circumstances in each situation, to be recommended by the Chief Engineer in-charge and in consultation with the Associate Finance.

(f) **The Above Advances Are Subject To The Following Conditions:-**

- (i) The advance shall carry an interest of 4.5% per annum above the Base Rate of State Bank of India, as effective on the date of approval of payment of the advance by the competent authority and be restricted only for high value tenders of Rs. 25 crore and above.
- (ii) Advances except those against machinery and equipment, shall be payable against irrevocable guarantee (Bank Guarantee, FDRs, KVPs/NSCs) of at least 110% of the value of the sanctioned advance amount (covering principal plus interest). The Bank Guarantee shall be from a Nationalized Bank in India or State Bank of India in a form acceptable to the Railways.
- (iii) The recovery shall commence when the value of contract executed reaches 15% of original contract value and shall be completed when the value of work executed reaches 85% of the original contract value. The installments on each “on account bill” will be on pro-rate basis.
- (iv) That the grant of advance is primarily in Railway’s own interest.
- (v) That a contract does not receive advances for same work form different officers.
- (vi) That arrangements are made with the Accounts Officer for proper accounts being kept with regard to payment and recovery of these advances and
- (vii) That all necessary precautions are taken to secure Government from the possibility of loss and for preventing the system becoming more general or continuing longer than what may be absolutely necessary for proper of the work.

(d) **Method of Recovery of Interest:-**

Interest shall be recovered on the advance outstanding for the period commencing from the date of payment of advance till date of particular on-account bill (through which recovery of principal is effected) and adjusted fully against on-account bill along with pro-rata principal recovery. In the event of nay short-fall, the same shall be carried forward to the next on-account bill and shall attract interest @4.5% per annum above the Base Rate of State Bank of India, as effective on the date of approval of payment of the advance by the competent authority.

The Bank Guarantee for such advances shall clearly cover at least 110% of the value of the sanctioned advance amount (covering principal plus interest).

(Authority: Railway Board’s letter No. 2007/CE-I/CT/18 Pt.3, dated 23.05.2012)

37(B) Incentive Bonus Payment Clause: Not Applicable

For early and time bound completion of throughput enhancement works primarily those coming under the plan heads Doubling and Traffic facilities, Incentive Bonus Payment Clause will be applicable subject to following conditions :-

- i) The incentive Bonus payable shall not be more than 1% of the initial contract value or revised contract value whichever is less for every one month of early completion ahead of the original completion period or revised completion period whichever is less.

- ii) The maximum incentive payable shall not be more than 6% of the original contract value or revised contract value whichever is less.
- iii) This incentive scheme shall not apply if extension to the original completion period is given irrespective of on whose account (Rly Account) or Contractors' account).
- iv) Period less than a month will not be reckoned for the incentive Bonus calculation.

38. CLAIMS

The contractor shall not be entitled to make any claim whatsoever against the Railway under or by virtue of or arising out of this contract, nor shall the Railway entertain or consider any such claim, if made by the contractor, after he shall have signed a "No Claim" certificate in favour of the Railway, in such form as shall be required by the Railway the work are finally measured up. The contractor shall be debarred from disputing the correctness of the items covered by "No Claim" certificate or demanding a clearance to arbitration in respect thereof under clause 43(2) of GCC 2014.

The Railway shall not be liable to the contractor for any matter arising out of or in connection with the contract or the execution of the works unless the contractor shall have made a claim in writing in respect thereof before the issue of the maintenance certificate under clause 50(I) of GCC-2014.

39. RAILWAY PASS OR CONCESSION:

No Railway pass or concession facilities will be given to the Contractors or their agents and laborers for the execution of the works. Contractor's materials required for execution of the work will have to be carried at the public rate of Railway freight if carried by Railway transport and no concession rate of Railway freight will be applicable.

40. TIME OF COMPLETION OF WORK:

This tender is submitted subject to the condition that the tenderer(s) shall complete the works covered by this tender in all respect within the period of time stipulated in Chapter –I. The time reckoned from the date of issue of letter of acceptance.

41. SPECIFICATIONS:

- (i) All the works shall be carried out in accordance with the specifications contained in these documents.
- (ii) Any specifications, not covered by these documents, shall be in accordance with relevant IRS Codes, IS Codes, IRC codes and MORSTH specifications read in the said order or as stipulated/approved by the Railway.

(iii) CONTRACTOR'S MATERIALS

- (a) The materials to be supplied by the Contractor for the works covered by these tender documents shall conform to specifications contained in these tender documents.
- (b) If called upon, the Tenderer(s) shall state the actual source of supply of material(s) to be supplied by him and shall submit test certificate & samples for prior approval.
- (c) During the execution of work, all materials brought to site by the Contractor must be Offered for inspection and passed by the Engineer or his representative before being used in the work and such approval shall be recorded in a register maintained for the purpose.

- (iv) Sanitary fittings to be supplied shall be of Hindustan, Nycer and Parry or any other approved brand and are subject to prior submission of samples and their approval thereof.

(v) PAINTS

- (A) All paints/distemper/plastic paints to be used shall only be those manufactured by One of the following firms or any other approved brand and of color and shade approved beforehand by the Engineer-at-site.

- (a) M/s Jenson Nicholson
- (b) M/s British / Burger paints.
- (c) M/s Shalimar Paints
- (d) I.C.I.
- (e) Nerolac.

- (A) These materials shall be brought in sealed drums and each drum shall be opened in the presence of the Engineer-at-site before use.

- (vi) Samples of any material(s) supplied by the Contractor may be got tested at the Contractor's cost in any recognized laboratory, at the sole discretion of the Engineer-in-charge.

42. SUPPLY OF MATERIALS

- (I) It is proposed to supply cement, reinforcement steel and structural steel required for the work as under:

(A) CEMENT(OPC)

The Contractor shall supply OPC under Schedule "C-I" of these documents and upon their use in the works shall be paid for at the accepted rates in the said Schedule "C-I". Full requirement for the work is proposed to be supplied by contractor under said schedule "C-I". The quantity of cement for payment shall be calculated as per actual consumption in the work and no payment for any wastage shall be done.

(B) REINFORCEMENT STEEL

The Contractor shall supply Reinforcement steel under Schedule "C-II" of these documents and upon their use in the works shall be paid for at the accepted rates in the said Schedule-"C-II". Full requirement

for the work is proposed to be supplied by contractor. The quantity of reinforcement steel for payment shall be calculated on the basis of actual consumption in the respective item(s) of work not allowing for any wastage, cut pieces etc.

(C) STRUCTURAL STEEL

The Contractor shall supply structural steel conforming to IS 2062: 2006 under Schedule “C-III” of this document for complete work and upon their use in the works shall be paid for at the accepted rates in the said Schedule “C-III”. All wastages etc is considered to be included in the rates and no wastages etc will be allowed.

For items executed under “ E.C. Railway USSOR’2012”, as contained in Schedule “B”, the supply of the materials by the Railway to contractor shall be under the terms and conditions specified in the preface of the book and the introductory remarks on top of each Chapter of the said book subject to the extent of modification detailed herein below:-

- (a) Materials supplied by the Railway from the Store/Godown(s) of JE/SE/(Con)/ situated at shall be carried by the Contractor to the site of work by his road vehicle, or by loading in wagons, as per Railway rules as directed by Engineer-at-site. The detention of wagons, if any, shall be on Contractor’s account. The tendered rates shall include all loading, unloading, leading, lifting, stacking, handling, crossing of lines / tracks / obstructions etc and no separate payment will be made in this respect (this supersedes provisions of payment for lead, lift of materials as specified in the introductory remarks of various chapters of ECR USSOR’ 2012)
- (b) The Railway shall not supply any water to the Contractor.
- (II)** Materials to be supplied by the Contractor under schedule “C-I”, “C-II” & “C-III” shall be delivered at the site of consumption and Railway shall make no payment towards handling, transport, storing and safe custody of the same.
- (IV)** While transporting and storing Railway materials, the Contractor should guard against any Deterioration damage or loss due to any cause whatsoever (viz cement becoming set due to moisture, steel getting rusted etc) for which the contractor shall make necessary precautions at his own cost and risk. Cost of materials damaged by the contractor shall be recovered as detailed in clause 42 (VI) (b) below.
- (V)**
- (a) In case of supply of cement by the Railway in Jute / Polythene bags, the empty bags, if not required by the Railway, shall be retained by the Contractor for disposal, preferably to the authorized bag collecting agents.
- (b) In case of supply of cement by the Railway in paper bags (as in the case of imported Cement) the paper bags shall be retained by the contractor for disposal in his own way and no recovery will be made from his bills towards empty paper bags.
- (VI)** The quantities of Railway materials issued by the Railway to the Contractor shall be commensurate with the progress of works, and shall be on a written demand from the contractor.
- (a) All materials issued by the Railway in excess of requirement shall be returned by the Contractor in good condition free of cost at the store of JE / SE (Con) from where they were issued. In case of reinforcing steel, cut pieces to the extent of Maximum 3% (Three percent) of actual consumption shall be the property of the contractor. For cement, no wastage will be allowed. For any excess over the above quantities, deduction at the rate worked out as per Para 42(VI)(b) below would be effected.
- (b) If the Contractor fails to return excess material issued to him (cement, reinforcing steel, and structural steel), the cost of such excess Materials shall be recovered at last purchase rate or current market rate plus 5% (Five percent) for freight, 12.5% (Twelve and half percent) for Supervision charges and 2% (two percent) towards incidental charges on the quantity not returned.
- (VII)** While transporting materials, whether Railways or his own, the Contractor shall be fully Responsible and answerable for any dislocation or damage caused to traffic on Road and for any accident which may occur on the route shall make good the same at his own risk & cost. It is deemed that the Contractor has fully indemnified the Railway against any claim made by any party for such dislocation, damage or accident and in the event of the Contractor failing to make good such loss, the Railway shall do so, at the Contractor cost, at their sole discretion.

43.0 Stage payment on supply of steel:

This clause will be applicable for works contract of value more than **Rs.15.00 (Fifteen)** crore each. Stage payment will be applicable for steel physically brought by the contractor to the site (even before its actual use in the work), subject to the following aspects:-

- a) The material shall be strictly in accordance with the contract specifications.

- b) The tender schedule shall provide for individual NS rate to be quoted by the tenderers for steel separately.
- c) The material shall be delivered at site and properly stored under covered sheds in measurable stacks.
- d) The quantities of materials shall be brought to the site only in such installments that would facilitate smooth progress of work and consumed in reasonable time.
- e) Proper account in the material register to be maintained in the prescribed format at the site for the receipt and use of the material.
- f) Ownership of such material shall be deemed to vest with the Railways for which the contractor should submit an indemnity bond in prescribed format.

Indemnity Bond Performa is available at Annexure-IX of Chapter-III

- g) Before releasing the stage payment, the contractor shall insure the material at his own cost in favour of Railways against theft, damages, fire etc.
- h) Stage payment in all such cases shall not be more than 75% of the rate of steel awarded in the contract the balance payment shall be released only after the material is actually consumed in the work. .
- i) The price variation claim for steel would continue to be governed as per extant PV clause and with reference to delivery at site.
- j) The quantity of steel to be brought to site, and for which stage payment will be admissible, shall be worked out by the contractor in consultation with the Engineer, for the first quarter, from date of issue of LOA + 15 days. Subsequent supply to site shall be done with approval of Engineer, on a quarterly basis, based on actual progress.

44. HIRE OF MATERIALS/EQUIPMENTS ETC & HIRE CHARGES.

- (i) Railway may provide 90R/52Kg U/S (Scrap) Rails (not exceeding 1000 running meters) and associated fitting such as fish plates fish bolts and dog spikes etc. free of any hire charge subject to availability. These will have to be returned to Railway in same condition after completion of the work.
- (ii) The Railway may give on hire to the Contractor any other material, plant and equipment, if available, on a specific request made by the Contractor to the Railway. But it will not entertain any claim for compensation due to the Railway's failure to do so or on the railways inability to supply such material, plant and equipment be an excuse for slow progress or non-performance of the work. However, issue of such material, plant and equipment shall not be allowed as a matter of course but permitted only in those cases where the need for help for the Administration could be established having regard to nature and urgency of situation and without adversely affecting the normal requirements of the Railway. A statement of materials thus issued and hire charges recovered should invariably be furnished along with the final bill.

(iii) RECOVERY OF HIRE CHARGES

The hire charges to be recovered are to be calculated as under

- 1) **Cost of materials** – The cost of materials shall be the book value last purchase rate approved value whichever is higher, plus 5% for freight and 2% for incidental charges thereon. The cost thus arrived at shall be increased by 12.5% for supervision charges as per extent rules.
- 2) **Hire charges**- The hire charges per annum will be calculated on the cost of the materials arrived at as per clause 44(iii)(1) above on the following basis: -
 - (a) Interest on the total cost should be charged at the running rate of dividend Payable by Railway in the General Revenue.
 - (b) Depreciation charges at 10% per annum of the cost arrived at as per Para 44(iii)(1) above to be charged for all classes of materials.
 - (c) Additional depreciation charges at 10% on the total of (a) & (b) above shall be charged to meet the contingencies.
- (iv) The Contractor shall bear the charges for carrying the materials to the site of work and back to store including other incidental charges including loading and unloading etc to the place of work as also back to the depot from where they were issued.
- (v) No cutting of holes shall be allowed in the materials thus issued which shall be returned to the railways in a completely good and serviceable condition. In case of failure of the Contractor to return any material in a good and serviceable condition, the cost thereof shall be recovered from contractor at the rate arrived at as per item 44(iii) (1) above increased by 100%. The decision of the DEN/AEN-in-charge of the work will be final in determining condition of the materials and same shall be binding on the Contractor.

- (vi) Running expenses including fuel, lubricants and stores and labour, if supplied by the railway, will also be paid for by the contractor at the cost to be determined by the Railway.
- (vii) Staff and stores for running the plant may be supplied by the Contractor with approval of Engineer-in-charge. The staff must be properly skilled to operate the plant concerned.

45. **RESPONSIBILITY FOR DAMAGE TO CONTRACTOR'S MATERIALS:**

- (i) The railway Administration will not be responsible for any loss or damage to contractor's materials, equipments, tools and plants due to fire, flood or any other cause(s) whatsoever.
- (ii) The materials issued by the Railway to the contractor for use in the works shall be treated as contractor's materials for this purpose, and the contractor(s) shall make good these materials in the event of any loss/damage thereto.
- (iii) Works finished but not taken over by the railway shall be treated as contractor's materials for this purpose, and the contractor shall be responsible for making good any loss or damage thereto.

46. **RESCINDING OF CONTRACT** – As per GCC-2014 with up to date correction slips.

47. **ARBITRATION CLAUSE**

All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of work or after its completion and whether before or after the determination of the contract shall be referred by the contractor to the Railway and the same will be dealt under clause 63 to 64 (7) of GCC 2014. Before demanding arbitration contractor shall submit his final claim within 30 days of determination of contract for which Railway shall reply within 120 days after receipt of such final claims stating whether all/any of such claims fall under excepted matters under clause 63 of G.C.C. or not. Arbitration can be demanded only for claims not falling under excepted matters in which case decision of Railways is final and binding on the contractor.

- 48. Vehicles & Equipment's of contractors can be drafted by Railway Administration in case of accidents/natural calamities involving human lives.

49. **ROYALTY:**

- 49.1 The minerals being used by the contractor should be purchased from valid authorized lease / permit holders / authorized dealers. It will be insured by Engineer-at-site.

In case of Mooram & earth these permits can be obtained from District Mining officer after entering into an agreement with land holder from where mineral is to be extracted.

- 49.2 The Railway shall do the followings to prevent evasion of royalty and illegal mining.

- i. Bill preferred by works contractor in which minor minerals has been used, must be accompanied with an affidavit form 'M' with particulars in form 'N' of the Rules as per execution of work in concerned state along with a photocopy of said affidavit and particulars. Bill should not be entertained unless accompanied with aforesaid documents.
- ii. The photocopy of the affidavit and the particulars received with the bill should be sent to District Mining Officer / Assistant Mining Officer within whose jurisdiction the mineral was allegedly purchased, for verification. If the said affidavit or information is found wrong, Mining Officer may take necessary / appropriate action against the contract as per rules.

- 50. It should be specifically noted that some of the detailed drawings may not have been finalized by the Railway and will, therefore, be supplied to the contractor as and when they are finalized on demand. No compensation whatsoever on this account shall be payable by the Railway Administration.

- 51. No claim whatsoever will be entertained by the Railway on account of any delay or hold up of the works(s) arising out of delay in approval of drawings, changes, modification, alteration, additions, omission and site lay out plan or detailed drawings and design and or late supply of such materials as are required to be arranged by the Railway or due to any other factor on Railway account.

- 52. No claim for idle labour and or idle machinery etc. on any account will be entertained. Similarly no claims shall be entertained for business loss or any such loss.

- 53. For some stretch land may not be available or acquired by railway. The land will be made available to contractor on proportionate basis depending upon the progress of work on the stretch, wherever land has been made available for the work.

- 54. **For carrying out any construction work in concerned state (Bihar/Jharkhand/UP etc.), the tenderer, 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 concerned state (Bihar/Jharkhand/UP etc.) Government and submit certificate of registration issued from the registering officer of the concerned state (Bihar/Jharkhand/UP etc.) Government (Labor Dep't).**

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.

55. The tenderers for carrying out any construction work 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 concerned State Govt. and submit certificate of Registration issued from the Registering Officer of the concerned State Government (Labour Dept.). As per this Act, the tenderer shall be levied a cess @1% of cost of construction work, which would be deducted from each bill. Cost of Material, when supplied under a separate schedule item, shall be outside the purview of cess.

56. **Provision of Employees Provident Fund and Miscellaneous Provisions Act,1952**

The contractor shall comply with the provisions of Para 30 & 36-B of the Employees Provident Fund Scheme,1952; Para 3 & 4 of Employees Pension Scheme, 1995 and Para 7 & 8 of Employees Deposit linked Insurance Scheme, 1976; as modified from time to time through enactment of "Employees Provident Fund & Miscellaneous Provisions Act, 1952, wherever applicable and shall also indemnify the Railway from and against any claims under the aforesaid Act and the Rules.

Witness:

1.

Signature of Tenderer(s)

2.

Date:

**DETAILS OF WORK OF SIMILAR NATURE OF PRESCRIBED VALUE OR MORE WHICH HAS BEEN COMPLETED IN LAST
THREE YEARS**

(i.e., current year and last three financial years)

Sl. No.	Name of Work	Authority under whom the work has been executed	Agreement/ acceptance letter reference with date of issue	Value of work as per agreement / acceptance	Date of actual completion of work/extended date of completion	Value of the work completed	Supporting Document
1							
2							
3							
4							
5							
6							

DETAILS OF WORK AWARDED TO THE FIRM DURING LAST THREE YEARS

(i.e., current year and last three financial years)

Sl. No.	Name of Work	Authority under whom the work has been executed	Agreement/ acceptance letter reference with date of issue	Value of work as per agreement / acceptance	Date of actual completion of work/extended date of completion	Value of the work	Supporting Document
1							
2							
3							
4							
5							
6							

DETAILS OF CONTRACTUAL PAYMENTS RECEIVED (As Desired in Eligibility Criteria No.2)
(i.e. current year and last three financial years)

Sl. No.	Name of employer/CA issuing certificate/document	Year for which Issue	Amount for which issued	Supporting Document
1				
2				
3				
4				

DECLARATION REGARDING ASSOCIATION OF RLY. OFFICER(S)/RETIRED RLY. OFFICER(S) WITH TENDERER(S)

Sl.No.	Name	Status with the tenderer	If working in Rly on the date of tendering, designation & place of posting	Date of retirement	Status at retirement	Particulars of permission taken for associating with the tenderer
1	2	3	4	5	6	7
1						
2						
3						
4						
5						
6						
7						

LIST OF COURT CASES DURING LAST 5 YEARS.

Sl.No.	Name of work	Value of work	Name of Client Dep't.	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								

LIST OF ARBITRATION CASES DURING LAST 5 YEARS.

Sl. No.	Name of work	Value of work	Name of Client Dep't.	Amount and date of claim preferred	Claim of Dep't. If any.	Brief reasons of disputes	Final / Present position of the case
1							
2							
3							
4							
5							

DETAILS OF EQUIPMENTS

Sl.No.	Description of equipments.	Numbers available	Detail of purchase	Date of manufacture	Material	How driven (i.e. Petrol/ Diesel/ Electric.)	Condition of the equipment	Where the equipment can be inspected
1	2	3	4	5	6	7	8	9
1								
2								
3								
4								
5								
6								

DETAILS OF TECHNICAL PERSONNEL

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
1							
2							
3							
4							
5							
6							

DETAIL OF EQUIPMENTS TO BE USED IN PROPOSED WORK.

Sl.No.	Description of equipments.	Numbers available	Detail of purchase	Date of manufacture	Material	How driven (i.e. Petrol/ Diesel/ Electric.)	Condition of the equipment	Where the equipment can be inspected
1	2	3	4	5	6	7	8	9
1								
2								
3								
4								
5								
6								

DETAILS OF TECHNICAL PERSONNEL TO BE DEPLOYED IN PROPOSED 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
1							
2							
3							
4							
5							
6							

**List of deviations proposed by the tenderer from the tender conditions in terms of
Para 11 of Chapter III**

S.N.	Details of special condition/ stipulation involving deviation from tender conditions	Reason/importance of special condition/ stipulation	Possibility of withdrawal of condition (Yes/No)	Cost of withdrawal of special condition/stipulation

bu

PROFORMA OF IDEMNITY BOND

Indemnity for Safe Custody of Reinforcement steel/Structural Steel as per Special Conditions of Contract Agreement No.: _____ dated: _____ for the work “ _____ ”

We (Name of Contractor) _____ hereby undertake that we shall hold at our Workshop at _____ for and behalf of the President of India and in trust for him the stores/articles(mentioned in annexure, details to be given for quantity for each section and grade) which may be and/or which has been made over to us, in connection with “_____” against the contract agreement No..... Dated.....

2. We shall be and remain absolutely responsible for the safe custody and protection of the said stores and articles against all risks, whatsoever, till those and assembled in the bridge to be fabricated against the above mentioned contract and duly delivered to the President of India or to his representative as he may direct and as such do hereby indemnify the president of India against any loss and/or damage to the said stores and articles while in our possession/custody. The said stores and articles shall however be at all times, open to the inspection by officers who may be authored on that behalf by ministry of Railways or its nominee.

3. Should however, at any time any loss or damage to as aforesaid, occurs or a refund become otherwise due to the President of India, he or his representative shall be entitled to recover from us compensation for, and in respect of such loss or damage, if any, or the amount to be so refunded without prejudice to any other remedies which may be otherwise available to the said president of India by way of deduction from any sum due to/or any sum which at any time hereafter may become due to us under this or any other contract.

In the event of any loss or damage as aforesaid, the assessment of such loss or damage and the assessment of the compensation therefore would be made by the President of India or his authorized nominee and the said assessment would be final and binding upon us.

For.....

DECLARATION FORM

For receiving materials from the Railways by the Firm.

“I/We hereby solemnly declare that the(Material) obtained is required for the purpose of Manufacturing(finished product) against Contract Agreement No..... dated.....The(material) will not be utilized for any other purposes or other wise disposed of without the prior approval of the president of India/Railways or his nominee”

Note:- This Performa is only for guidance and may be changed/amended at any stage at the discretion of Engineer. This is to be submitted on stamp paper of appropriate value at the Contractor’s cost.

FORMAT OF
MEMORANDUM OF UNDERSTANDING
FOR
JOINT VENTURE AGREEMENT

This Memorandum of understanding is made at (name of place) on this _____
day of _____ between/among

(i) M/s (Name of Company) _____, a company registered under the Companies Act 1956 having its registered office at _____ represented through its Authorized Managing Director/Director/Managers of the company Sri _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the FIRST PART

OR

(i) M/s (name of partnership firm), a partnership firm registered under the Indian Partnership Act 1932, having its registered office at _____ represented through its one of the authorized partner Shri _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the FIRST PART

OR

(i) M/s (name of proprietorship firm) having it registered office at _____ represented through its proprietor Sri _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the FIRST PART

AND

(ii) M/s (Name of Company) _____, a company registered under the Companies Act 1956 having its registered office at _____ represented through its Authorized Managing Director/Director/Managers of the company Sri _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the SECOND PART

OR

(ii) M/s (name of partnership firm), a partnership firm registered under the Indian Partnership Act 1932, having its registered office at _____ represented through its one of the authorized partner Shri _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the SECOND PART

OR

(ii) M/s (name of proprietorship firm) having it registered office at _____ represented through its proprietor Sri _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the SECOND PART

AND

(iii) M/s (Name of Company) _____, a company registered under the Companies Act 1956 having its registered office at _____ represented through its Authorized Managing Director/Director/Managers of the company Sri _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the THIRD PART

OR

(iii) M/s (name of partnership firm), a partnership firm registered under the Indian Partnership Act 1932, having its registered office at _____ represented through its one of the authorized partner Shri _____ (hereinafter referred to as _____



which expression shall unless repugnant to the context thereof includes its successors) of the THIRD PART

OR

(iii) M/s (name of proprietorship firm) having its registered office at _____ represented through its proprietor Sri _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the THIRD PART

Whereas, East Central Railway has invited Tender Nos. _____ hereinafter referred to as the ECR Tender for the work of _____ hereinafter referred to as the said work.

Whereas, the member of the first part i.e. M/s. _____ (details to be supplied of the expertise in their field).

Whereas, the member of the second part, M/s _____ (details to be supplied of the expertise in their field).

Whereas, the member of the third part, M/s _____ (details to be supplied of the expertise in their field).

AND whereas members to this MOU have agreed to co-operate with each other to associate jointly and to form a Joint Venture Firm to participate in the Tender no. _____ dt E,C,Railway .

Now, therefore, in consideration of the premises and mutual promises and of the undertaking contained herein, the constituent members are hereby agreed as follows: -

1. The purpose of MOU: –

M/s. _____, _____ and _____ agree to co-operate with each other for the purpose of joint participation in Tender no.....dt.....of. E. C.Rly, and in the event, the contract is awarded, to jointly execute the contract. The broad interfaces and scope of work of each party is set forth below:-

- 2. The name of the Joint venture firm shall be _____.
- 3. The constituent members, hereto, represent that: they are in possession of all approvals and valid authorization for the purpose of execution of this MOU.
- 4. That each of the members of the JV, agrees and undertake to place at the disposal of the JV, benefits of its individual experience, technical knowledge and skill and shall in all respects bear its share of the responsibility, including the provision of information advice and other assistance required in connection with the works. The share and the participation of the partners in the JV shall broadly be follows:

M/s _____ %

M/s _____ %

M/s _____ %

5. Lead Member:

In respect of tender no. ___dt___ of E.C.Railway M/S _____ shall be a lead member who has a majority (at least 51%) share of interest in the JV firm.

6. The constituent members to this MOU undertake:

- a) That after submission of the tender, the MOU shall not be modified/alterd/terminated during the validity of the tender except when modification becomes inevitable due to succession laws etc., but in no case the minimum eligibility criteria would be vitiated. The members to this MOU further agree that the Lead Member will continue to be the Lead Member of J.V. Firm.
- b) That after the contract is awarded the constitution of the J.V. Firm shall not be altered during the currency of contract except when modification becomes inevitable due to Succession Law etc., but in no case the minimum eligibility criteria would be vitiated.
- c) No any member of J.V. firm shall participate in this tender either in individual capacity or as a member of another JV. Firm.

7. Joint and several liabilities:

In respect of tender no. _____dt_____ of E.C.Railway, all terms shall be complied by constituent members on back-to-back basis as per specifications of the Tender no.dt.....of E.C.Rly or any other mutually agreed terms with the E.C.Railway. The members hereto shall, if awarded the contract for the project for which the Joint Venture is formed, be jointly and severally liable to the Indian Railways for execution of the project in accordance with the contract. The members hereto also undertake to be liable jointly and severally for the loss, damages caused to the Indian Railways in course of execution or due to non-execution of the contract or part thereof or arising out of the contract.

8. Authorized member:

Shri _____ shall be authorized member on behalf of the Joint Venture to deal with tender, to 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 tender no.dt___ of E.C.Railway. All notices/correspondence with respect to this contract shall be sent only to this authorized member of the J.V. Firm on the address stated herein below:-

M/s. _____.

Such communications or notices shall be deemed to have been duly served/given to all constituent members/JV firm when so delivered/received.

9. The constituent members agree that with respect of tender no. _____dt_____ of E.C.Railway neither members, nor any subsidiary company of either member, nor any joint venture company or any other entity, in which the member /members, or are in any way interested, shall compete together with or through any third party, nor shall the members advise, consult, for engage in or otherwise assist in any way any person or entity or any affiliate thereof in respect of any order or contracts related to tender no. ___dt___ of E.C.Railway.

10. Responsibility

Each member shall assume and accept full responsibility for its Scope of Work and the obligations imposed in the Contract and in this MOU as if it was, with regard to its Scope of Work, an independent partner contracting individually with the E.C.Railway. In the event of any defect and damage or any claim arising from the E.C.Railway under the Contract or any third party in relation to or as a consequence of any failure to meet the performance specification the Party, within whose Scope of Work the claim arises, shall be entirely responsible for the claim and shall indemnify and hold harmless the other Party from any liability, demand, claim burden cost, expense attorney's fees and costs arising from thereof.

11. Assignability

No member to the Joint Venture has 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 E.C.Railway.

12. Machinery, Instruments, Labour Force etc.

The members hereto undertake that whatever the machinery, instruments, Labour force (including unskilled, skilled, inspectors, Engineers etc.) they possess at the time of entering into Joint Venture Agreement or which subsequently shall come in their possession, the member/members having the

control over the said machinery, instrument, labour force etc will have no objection when these are utilized by the JV firm for the purpose of execution of the contract without any hindrance and obstacle.

13. Duration of MOU:

It shall be valid during entire currency of contract including the period of extension, if any and also till the maintenance period is over or till all the contractual liabilities including warranty/guarantee obligations are discharged completely.

14. Applicable Law:

This MOU and any arrangement/agreements regarding the performance shall be construed and interpreted in accordance with and governed by the Laws of India and shall be subject to the exclusive jurisdiction of the courts at PATNA.

15. Settlement of Disputes:

In the even of disputes arising from this MOU, the constituent members to the MOU undertakes to endeavor to settle the said disputes amongst them amicably. However, if the members fail to resolve the disputes amongst them amicably, the said disputes arising out of or in connection with the present MOU shall be resolved through Arbitration as per the provisions enshrined under the Arbitration and Conciliation Act, 1996 or/and amendments thereof.

16. Each member shall have full and sole responsibility to bear the expense of and effect the payment of any taxes, duties, special insurance, fees or assessments of any nature whatsoever (including personal income taxes level or imposed on any of its employees or personnel or any of its sub-contractor's employees or personnel).

17. The members to this MOU declares and certifies that they have not been black listed or debarred by Railways or any other Ministry/Department of the Govt. of India/State Govt. from participation in tenders/contract in the past either in their individual capacity or the JV firm or partnership firm in which they were member/partners.

In witness whereof, the constituent members have caused this MOU to be executed by their respective authorized representatives on the date and year mentioned here in above.

Signature: -	Signature:-	Signature: -
Shri _____ of	Shri _____ of	Shri _____ of
M/s. _____	M/s. _____	M/s. _____

Witnesses: -

1) Signature: Name: Address:-	1] Signature: Name Address:-	1] Signature: Name Address:
2) Signature:: Name: Address:-	2] Signature: Name: Address:	2] Signature: Name:: Address:

(Note; This Performa is not exhaustive and can be changed/amended at the discretion of the Railway.)



FORM OF BANK GUARANTEE BOND
GUARANTEE BOND

1. In consideration of the President Of India (hereinafter called "the Government") having agreed to exempt (hereinafter called "then said Contractor(s)") from the demand, under the terms and conditions of as Agreement dated made between and for (herein after called "the said Letter of Acceptance/Agreement"), of **security deposit/performance guarantee/mobilization advance guarantee** for the due fulfillment by the said Contractor(s) of the terms and conditions contained in the said Letter of Acceptance/Agreement, on production of Bank Guarantee for Rs..... (Rupees We (hereinafter referred to as "The Bank").

(Indicate the name of the Bank) at the request of (contractor(s)) do hereby undertake to pay to the Government an amount not exceeding Rs. against any loss or damage caused to or suffered or would be caused to or suffered by the Government by reason of any breach of the said Contractor(s) of any of the terms or conditions contained in the said **Letter of Acceptance/Agreement**.

2. We (indicate the name of the bank) do hereby undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Government stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Government by reason of breach by the said (contractor(s) of any of the terms or conditions contain in the said **Letter of Acceptance/Agreement** or by reason of the (contractor(s) failure to perform the said **Letter of Acceptance/Agreement**. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.
3. We undertake to pay to the Government any money so demanded notwithstanding any dispute or disputes raised by the (contractor(s)/supplier(s) in any suit or proceeding before any court of tribunal relating there our liability under this present being absolute and unequivocal. The payment made by us under this bond shall be a valid discharge of our liability for payment there under and the (contractor(s)/supplier(s) shall have no claim against us for making such payment.
4. We (indicate the name of the bank) further agree that the guarantee herein contained shall remain full force and effect during the period that would be taken for the performance of the said **Letter of Acceptance/Agreement** and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said **Letter of Acceptance/Agreement** have been fully paid and its claim satisfied or discharged or till **FA&CAO/Con/ECR** office/Department Ministry of **Railway** certifies that the terms and conditions of the said **Letter of Acceptance/Agreement** have been fully and properly carried out by the said contractor(s) and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the we shall be discharged from all liability under this guarantee thereafter.
5. We (indicate the name of the bank) further agree with the Government that the government shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said **Letter of Acceptance/Agreement** or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) and to forebear or enforce any of the terms and conditions relating to the said **Letter of Acceptance/Agreement** and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said contractor(s) or by any forbearance, act or omission on the part of the Government or any indulgence by the Government to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
6. The guarantee will not be discharged due to the change in the Constitution of the bank of the contractor(s)/supplier(s).
7. We (Indicate the name of the bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Government in writing.

Date the day of ... 2010

for

(Indicate the name of Bank)



**FORMAT FOR AFFIDAVIT TO BE SUBMITTED BY TENDERER
ALONG WITH THE TENDER DOCUMENTS**

(To be executed in presence of Public Notary on non-judicial stamp paper of the value of Rs. 100/- . The stamp paper has to be in the name of the tenderer)**

I (Name and designation)** appointed as the attorney/authorized signatory of the tenderer (including its constituents), M/s. _____ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of _____ as per the Tender No. _____ of East Central Railway, do hereby solemnly affirm and state on behalf of the tenderer including its constituents as under:

1. I/We the tenderer(s), am/are signing this document after carefully reading the contents.
2. I/We the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.
3. I/We hereby declare that I/We have downloaded the tender document from of East Central Railway website www.tenders.gov.in and printed the same. I/We have verified the content of the printed document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenders, execution of work or final payment of the contract, the master copy available with the Railway Administration shall be final and binding upon me/us.
4. I/We declare and certify that I/we have not made any misleading or false representation in the forms, statements and attachments in proof of the qualification requirements.
5. **I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.**

I/We declare that the information and documents submitted along with the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents, submitted by me/us.

6. I/We understand that if the certificates regarding eligibility criteria submitted by me/us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the tender EMD besides suspending of business for one year. Further, I/we [insert name of the tenderer]** _____ and all my/our constituents understand that my/our offer shall be summarily rejected.
7. I/We also understand that if the certificates submitted by me/us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination of the contract, along with forfeiture of EMD/SD and Performance Guarantee besides any other action provided in the contract.

DEPONENT
SEAL AND SIGNATURE OF THE TENDERER

VERIFICATION

I/We above named tenderer do hereby solemnly affirm and verify that the contents of my/our above affidavit are true and correct. Nothing has been concealed and no part of it is false.

DEPONENT
SEAL AND SIGNATURE OF THE TENDERER

Place:

Dated:

** The contents in Italics are only for guidance purpose.

Details as appropriate, are to be filled in suitably by tenderer.
Attestation before Magistrate/ Notary Public.

East Central Railway,
Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna - 800004.

Tender No. 02 of 2016-17 (Open)/South in Two Packet System

SPECIAL CONDITIONS OF THE CONTRACT (GENERAL)

1. COMMUNICATIONS WITH CONTRACTORS (S):

Subject to and as otherwise provided in this contract, all notices (in writing) as are required to be given shall be signed by competent Officer of the Railway for and on behalf of The President of India and all other actions shall be taken by the Engineer and/or his representative.

2. The contract shall be governed by the provisions of the GCC-2014 modified to the extent of provisions of these documents.

3. COMMENCEMENT OF WORK:

The contractor will commence the work within 15(fifteen) days from the date of issue of the letter of acceptance of the tender, failing which contract may be terminated and full value of the Earnest Money & P.G. may be forfeited.

3.1 Arrangement of required land for construction of site office, labour huts, store sheds etc. and arrangement of required water and electricity for all purposes in connection with this work shall be at the contractor's responsibility, liability and cost as per tender conditions. Any delay in making arrangements for the same shall not be taken as an excuse for delay in starting the work.

3.2 DISMANTLING:

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 shall be done after approval of Railway.

(a) The dismantling of structure should be done under proper supervision and as per approved scheme of dismantling

(b) At major dismantling sites minimum level of supervision shall be Senior Section Engineer (In-charge), who should be nominated by Dy. Chief Engineer/ Con. in writing.

(c) The dismantling Plan should be scrutinized by the Drawing Office and approved by H.O.D. 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.

(d) Proper barricading should be done to stop access of unauthorized personnel near the dismantling area. Wherever necessary, assistance of RPF should be taken to prevent people from coming close to dismantling area. The contractor should also display sign Boards warning people not to enter the danger zone.

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

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

III. 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.

3.3 SAFETY MEASURES:

The following measures should be adopted to ensure safety of the trains as well as work force.

i) The contractor shall not start any work without the presence of Railway Supervisor at site.

ii) Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out 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.

iii) The look out and whistle caution orders shall be issued to the trains and speed restrictions imposed where considered necessary suitable flagmen/detonators shall be provided where necessary for protection of trains.

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

COMPETENCY CERTIFICATE

Certified that Sri.....P.Way supervisor of M/shas been examined regarding P.Way working onwork. his knowledge has been found satisfactory and he is capable of supervising the work safely

Assistant Engineer

- v) The unloaded ballast/rails/sleepers/other P.Way materials after unloading along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.
- vi) Supplementary site specific instructions, wherever considered necessary, shall be issued by the Engineer-in-charge.

4.1 **PROGRAMME FOR COMPLETION OF WORK & EXTENSION OF TIME OF COMPLETION**

Immediately after receipt of the letter of acceptance, the contractor will submit a detailed programme in the form of a Bar Chart (showing various important activities) for completion of the work within the stipulated completion period, duly signed, for the approval of Engineer – in-charge of the work. A separate statement indicating the schedule and time frame of materials, labour and equipment and other arrangements to be made by the contractor for the work, should also be submitted. Every extension of time of completion will be dealt under clause 17 of GCC 2014.

During execution of work contractor shall also submit each month works revised programme indicating original approved programme and measures taken to make up the slippage from the original programme, if any. He shall also submit monthly progress/programme in the form of PERT chart with weekly break up of activities in first week of every month.

4.2 **EXTENSION OF TIME FOR COMPLETION WORK ON CONTRACTOR ACCOUNT**

The existing tender clause 17(B) of GCC provide for recovery of liquidated damages from the contractor delay in completion of work. The competent authority while granting extension of time for existing contract under clause 17(B) of GCC may impose token penalty instead of liquidated damage as deemed fit based on the merits of the case and no case this shall be more than ½% (Half percent) per week.

5 **EQUIPMENTS**

The contractor shall bring to the site, necessary equipments, tools and plants for carrying out the work within 15 (Fifteen) days of the letter of acceptance, and report to the Engineer-at-site.

6. **PREVENTION OF ACCIDENTS**

- (A) 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-in-charge for permission giving the type & number of individual vehicle, name & license particular of the drivers, location duration & timings for such work/ movement. The Engineer-in-Charge or his authorized representative will personally counsel, examine and certify, the road vehicle drivers, contractor's flagmen and supervisor and will give written permission giving names of road vehicle'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) Nominated vehicles & drivers will be utilized for work in the presence of at least one flagman & one supervisor certified for such work.
 - (ii) 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 center shall be done only in the presence of Railway employee authorized by the Engineer-in-charge No part of the road vehicle will be allowed at less than 3.5m from track center. Cost of such railway employee shall be borne by the Contractor.
 - (iii) The Contractor shall remain fully responsible for ensuring safety & in case of any accident shall bear cost of all damages to his equipment & men and also damages to railway & its passengers.
 - (iv) Engineer-in-charge may impose any other condition necessary for a particular work or site.
 - (v) Road vehicle can ply along the track after suitable cordoning of track with minimum distance of 6 m from the center 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 –in-charge of the work including officers and the in-charge of the section.
 - (vi) The road vehicles will ply only between sunrise and sunset save as per clause (v) above
 - (vii) Contractor shall provide 150mm thick white line with lime at a distance of 3.5m from center of existing track. This white line shall be in the entire length where work is going on and/or the vehicles/machinery is playing along the track. Nothing extra shall be paid for this.
 - (viii) Barricading with the help of portable fencing shall be provided in the length where the days work is to be done in close vicinity of the track. The fencing shall consist of self-supporting steel columns shall be of 1.2 m heights. This will be placed at a distance of 3.5 form centerline of the nearest track.
 - (ix) Railway 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.
 - (x) The area between running line and white line shall not be permitted to become slushy and adequate drainage must be ensured at all times.

- (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) here 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 contractor(s) 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 contractor(s) 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 contractor(s) 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, Railways 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 Railway under any circumstance or law of the country pays such damage; the same shall be fully recovered from the Contractor(s) due.
 - (B) During the execution of works, unless otherwise specified the contractor shall at his own cost provide materials and execute all shorting, timbering and strutting works as is necessary for the stability and safety of all structures, excavations and works and shall ensure that no damage, injury or loss is caused or likely to be caused to any person or property.
 - (C) Existing roads or water courses shall not be blocked, cut through, altered, diverted or obstructed in any way by the contractor, except with the permission of the Engineer. All compensation claimed for any unauthorized closure, cutting through, alternation, diversion or obstruction to such roads or water courses by the Contractor or his agent or his staff shall be recoverable from the contractor by deduction from any sums which may become due to him in terms of the contract, or otherwise according to law.
 - (D) During progress of work in any street or through farm, the contractor shall make adequate provision for the passage of traffic, for securing safe access to all premises approached from such street or through fare and for any drainage, water supply or means of lighting which may be interrupted by reason of the execution of the works and shall correct and maintain at his own cost barriers lights and other safeguards as prescribed by the Engineer for the regulation of traffic, and provide watchmen necessary to prevent accidents. The work shall in such cases be executed day and night if so ordered by the Engineer and with such vigor so that the traffic way be impeded for as short a time as possible.
 - (E) The contractor shall be responsible to take all precautions to ensure the safety of the public property or railway property and shall post such lookout men as may in the opinion of the Engineer be required to comply with regulations pertaining to the work
 - (F) The contractor shall be responsible for the safety of all employees directly or through petty contractors or sub-contractor employed by him on the works and shall report serious accidents to any of them however and whenever occurring on the work to the Engineer or the Engineer's Representative and shall make every arrangement to tender all possible assistance.
 - (G) The Contractor shall be responsible for all risk to the works and for trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway or the lives, persons or property of others from whatsoever cause in connection with the works until they are taken over by the Railway and this although all reasonable and proper precautions may have been taken by the Contractor and in case the Railway shall be called upon to make good any costs, loss or damages, or to pay any compensation, including that payable under the provisions of the Workmen's compensation Act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid by reason of any act, or any negligence or omissions on the part of the contractor the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway may incur in reference thereto, shall be charged to the Contractor. The Railway shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the Contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to Contractor, as aforesaid, any sum or sums of money which may be paid any expenses whether of any such payment, defense or compromise, and the incurring of any such expenses shall not be call in question by the Contractor.
 - (H) 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.
 - (I) All the work inside a tunnel, deep cuttings, on bridges, constricted areas etc. should be carried out in accordance to the provisions in Chapter VIII of IRPWM and Para 1009 of Bridge Manual 1998 and preferably under block protection.
7. **SAFETY FIRST BOOK.**
The successful tenderer(s) i.e. the contractor(s) shall purchase, if he does not already possess a copy of the booklet " SAFETY FIRST " which may be purchased from the office of the Chief Administrative Officer (Con) / East Central Railway, Mahendrugat, Patna - 4.
8. **ENGAGEMENT OF ENGINEERING GRADUATES/DIPLOMA HOLDERS**

- (i) In terms of provisions of new Clause 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.
- (ii) Further, in case the contractor fails to employ the Qualified Engineer, as aforesaid in Para 3 above, he in terms of provision of Clause 26A.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 Para 3(a) and 3(b) above respectively.
- (iii) Provision for deployment of Qualified Engineer (Graduate Engineer or Diploma Holder Engineer) shall be for the values as prescribed above. However, for the works contract tenders, if it is considered appropriate by the tender inviting authority, not to have the services of qualified engineer, the same shall be so mentioned in the tender documents by the concerned Executive with the approval of Officer not below the level of SAG Officer, for reasons to be recorded in writing.

8A. Clause GCC- Provision of efficient and competent staff at work sites by the contractor:

- (i) 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 & labourer in or about the execution of any of these works as are careful and skilled in the various trades.
- (ii) 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.
- (iii) 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 Railway to rescind the contract under Clause 62 of these conditions.

8B. Clause GCC- Deployment of Qualified Engineers at work sites by the contractor:

- (i) The contractor shall also employ Qualified Graduate Engineer or Qualified Diploma Holder Engineer, based on value of contract, as may be prescribed by the Ministry of Railways through separate instructions from time to time.
- (ii) In case the contractor fails to employ the Engineer, as aforesaid in Para above he shall be liable to pay penalty at the rates, as may be prescribed by the Ministry of Railways through separate instructions from time to time for the default period for the provisions, as contained in Para above.
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.

8C. It has also been decided that for track related contractual works of values, as specified in above, individuals having Diploma in Railway Engineering awarded by IPWE (India) shall also be considered as qualified Diploma Holder Engineers and contractors for track contract works can employ such individuals at their work site on Indian Railways.

9. TOOLS AND PLANTS

It should be clearly understood that it is entirely the Contractor's responsibility and liability to find, procure and use all machinery, tools and plants and their spare parts that are required for efficient and methodical execution of the work. Delay in procurement of such items due to their non-availability or import difficulties or any other cause whatsoever will not be taken as an excuse for not carrying out the work.

10. QUALITY ASSURANCES

- (i) The Contractor will submit QAP (Quality Assurance Programme) conforming to ISO 9001 or similar accreditations, in details in regard to the measures, which will be taken by them for quality assurance during execution of the work. The details should include the ISO 9001 or similar accreditation measures to be adopted, testing facilities to be developed at site and consultants to be engaged in this regard if any.
- (ii) The contractor shall create a separate Quality Assurance Cell which shall be responsible exclusively for monitoring of quality aspects as per approved Quality assurance plans etc, specifications and contract conditions. No personnel of this cell shall, in any case, be involved in execution of works.

- (iii) During the execution of work, the Firm will have to comply with all the measures directed by the Engineer to ensure quality of work. The decision of the Engineer in this regard will be final.
 - (iv) In case a contractor executes a work, which is below the specified structural strength, the work shall be dismantled and re-executed at contractor's cost at the sole discretion of the Engineer at site.
 - (v) In case a contractor executes a work which is structurally up to specification, but sub- standard in finish, the same may be approved and accepted by the Railway in case where finish is not so important, at the Railways' sole discretion, provided that where such a work is accepted, the payment for such work shall be at 80% of rates accepted for such work in the Schedule of items.
11. **WORKMEN OF THE CONTRACTOR (S)**
- (i) It would be appreciated by the Contractor(s) that there are a number of areas of work where no amount of supervision by Railway can ensure proper quality of work. The quality can only be ensured if competent, experienced and skilled workmen are employed to carry out the job.
 - (ii) The Contractor shall, therefore, engage workmen having adequate competence, experience and skill for doing the work at site.
 - (iii) In case the Engineer-at-Site finds that any one or more of the workmen of the Contractor is not competent or is in-experienced or not skilled enough, he may order the contractor to remove such workmen from the site of work and to replace them by other suitable workmen. The Contractor shall be bound to remove such workmen from site and to replace them by suitable workmen without any claim and/or delay, the decision of the Engineer-at-Site shall be final and binding on the contractor.
12. **USE OF EXPLOSIVES.**
- 12.1 Arrangement, storage and use of explosive for blasting will be the responsibility of the contractor, in accordance with Law & Regulations in force at the material time, including obtaining necessary licenses.
 - 12.2 All equipment's, machinery, tools, like large capacity air compressors, Pneumatic rock drills, power shovels, dumpers shall be arranged, maintained and operated by the contractor.
 - 12.3 The contractor(s) shall be responsible for taking full precautions for ensuring proper safety of life and property adjoining the areas, where explosives are used/ stored and shall pay for all the damages caused as a result of use/storage of explosives.
 - 12.4 Tenderer's special attention is drawn to the conditions of contract in respect of Explosive and Blasting as enumerated in clause 35 of GCC 2014.
13. **NIGHT WORK:**
- The contractor shall have to carry on with the work during night if considered essential to maintain the progress of the work and his quoted rates should be inclusive of any additional expenditure involved in the working at night. Such work should, however, be made by the contractor at his cost. Prior permission of Dy.CE/Con shall be obtained for night working. Permission once given by Dy.CE/Con may be withdrawn if considered necessary due to any reason.
14. **APPROACH ROAD ETC:**
- The contractor at his own cost shall develop and maintain all the required approach roads for proper execution of various items of this contract.
15. **MAINTENANCE PERIOD:**
- Entire work will be maintained by the contractor in satisfactory condition for a period of 12 months from the date of physical completion of work and date of issue of completion certificate by DyCE/C/ concerned.
16. **COMPLETION DRAWINGS:**
- Contractor shall, within his quoted rates, prepare and submit detailed completion drawings of all the works executed by him, prepared in AUTOCAD, in three copies on tracing sheets, six copies on paper-sheets and three copies in CD. Drawings may be submitted in phased manner as the works get completed as directed by Engineer. However, all the drawings shall be submitted within 30 days of date of completion.
17. **CONTRACTOR TO STUDY DRAWING & SPECIFICATIONS ETC. AND HIS LIABILITY**
- The tenderer shall be responsible for close scrutiny of the approved drawings supplied by the Railway. For any discrepancies, error or omissions in the drawings or in other particulars indicated therein, the contractor shall approach the Railway immediately for rectification of such discrepancies, errors and omissions. If any dimension/figure/ features etc. on approved drawings or plans differ from those drawings or plans issued to the tenderers at the time of calling of the tender, the dimensions as figured upon the approved drawings or plans shall be taken as correct. No claim shall be entertained on this account and decision of Railway shall be final, binding and conclusive on the contractor.
18. **LAND FOR OFFICE AND FABRICATION YARD/STORE/ASSEMBLY YARD ETC:**
- No land belonging to or in possession of Railway shall be occupied by the contractor without the permission of Railway. The contractor shall not use or allow to be used, the site for any purpose other than that of executing the work. Whenever non railway bodies/persons are permitted to use railway premises with competent authority's approval, conservancy charges as applicable from time to time may be levied.
19. **FIELD LABORATORY**
- The contractor shall establish a field laboratory for testing of all materials/soil/compaction/aggregate/concrete/ blanket material etc in connection with execution of the works in the contract stretch as per the provisions of the contract at his cost. The Lab shall contain all the

required testing equipments to ensure works as per specifications laid down / as per the contract provisions.

20. SETTING OUT OF THE WORK

The contractor (at his own cost) will keep deployed at least one survey team, consisting of one competent surveyor, two competent survey staff and a TOTAL STATION SURVEY INSTRUMENT of approved configuration WITH ALL OTHER ACCESSORIES for exact and precise setting out of the all the works. Contractor shall also have to make/maintain adequate numbers of secondary reference survey pillars /points/ towers of suitable dimensions.

OFFICE AND FABRICATION YARD/STORE/ASSEMBLY YARD ETC:

No land belonging to or in possession of Railway shall be occupied by the contractor without the permission of Railway. The contractor shall not use or allow to be used, the site for any purpose other than that of executing the work. Whenever non railway bodies/persons are permitted to use railway premises with competent authority's approval, conservancy charges as applicable from time to time may be levied.

21. PROJECT MANAGEMENT AND SITE FACILITIES BY THE CONTRACTOR: (Applicable)

Contractor shall maintain following office/site facilities at the bridge site/other locations for ensuring smooth and efficient communication and work execution. Cost of these facilities is deemed to be included in the quoted rates and nothing extra shall be paid for this item.

- (i) Contractor shall maintain round the clock electricity in site offices.
- (ii) Contractor shall maintain minimum three computers of approved configuration (desktops/ laptops) with at least one color (RICOH- Aficio M.P.2000 Le) or similar printer for Railway offices. The contractor shall also maintain one competent and qualified operators who should be aware of hardware and software both. Contractor shall maintain and always keep above machines in the good working conditions and take away the same at the time of completion of the works. Contractor shall provide a vehicle for full time to the railway during completion period & extended time period if any, with maximum limit of 3000 Km per month. The vehicle shall be in good condition to the satisfaction of railway engineer in charge. The cost of vehicle and operational charges including driver, fuel, lubricant etc. are to be borne by the contractor.
- (iii) The contractor (at his own cost) will keep deployed at least one survey team, consisting of one competent surveyor , one/two competent survey staff and a **TOTAL STATION SURVEY INSTRUMENT** of approved configuration **WITH ALL OTHER ACCESSORIES** for exact and precise setting out of the all the works. Contractor shall also have to make/maintain adequate numbers of secondary reference survey pillars/points/towers of suitable dimensions.
- (iv) Non compliance of above conditions may attract a penalty upto Rs.25,000/- per month, as decided by Engineer, whose decision in this regard shall be final, binding and conclusive. In case, above facilities are not provided by contractor then Railway may provide the same at the contractor's cost, out of the penalty amount.

Witness:

- 1. _____
- 2. _____

Signature of Tenderer(s)

Date:



**East Central Railway,
Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna - 800004.
LETTER OF APPLICATION BY THE TENDERER
FORM OF TENDERER (FIRST SHEET)**

Tender No.....

Name of work

To

The President of India

Acting through the

.....

.....Railway

I/Wehave read the various conditions to tender attached here to and agree to abide by the said conditions. I/We also agree to keep this tender open for acceptance for a period of 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 forRailway, at the rates quoted

in the attached schedule and hereby bind myself/ourselves to complete the work in all respects withinmonths from the date of issue of letter of acceptance of the tender.

2. I/We also hereby agree to abide by the General Conditions of contract corrected up to printed/advance correction slip No..... datedand to carry out the work according the Special Conditions of Contract and Specifications of materials and works at laid down by Railway in the annexed Special Condition/Specifications and the Railway Works Hand Book Part II/III corrected up to printed/advance correction slip No. datedSanitary Works Hand Book corrected up to printed/advance correction slip No..... dated Schedule of Rates Part I and Part II corrected up to printed/advance correction slip No. Dated for the present contract.

3. A sum of Rs..... is herewith forwarded as Earnest Money. The full value of the earnest Money shall stand forfeited without prejudice to any other right or remedies in case my/our Tender is accepted and if:-

- (a) I/We do not execute the contract documents within seven days after receipt of notice issued by the Railway that such documents are ready; and
- (b) I/We do not commence the work within fifteen days after receipt of orders to that effect.

4. Until a formal agreement is prepared and executed, acceptance of this tender shall constitute a binding contract between us subject to modifications, as may be mutually agreed to between us and indicated in the letter of acceptance of my/our offer for this work.

Signature of Witness:-

(1).....

(2).....

.....

Signature of Tender(s)

Date.....

Address of the Tender(s)





EAST CENTRAL RAILWAY
(CONSTRUCTION DEPARTMENT)

of

Tender Notice No. 45 of 2015-16 (Open)/South two packet system
Tender No. 86 of 2015-16 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa Road (Including Garwa Road Yard) and Garhwa (Excluding Garhwa yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Date of Dropping of Tender Document: 18.05.16

Date of Opening of Tender Box: 20.05.16

(Financial Bid)

PART-II

by

East Central Railway,
Office of the Chief Administrative Officer (Con),
Mahendrugat, Patna - 800004.

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Schedule of items (Rates to be quoted in this rate sheet only)

S. N.	Description of item/Schedule	Rate (% above/below/at par)	
		In Figure	In words
Schedule-A-I			
1	Over all percentage Above/Below/At par over the basic rates of item under Annexure of Schedule-A-I (Approx. basic cost Rs. 4,11,47,116.99 As per details in Annexure A-I		
Schedule-B-I			
2	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-I (Approx. basic cost Rs. 10,51,62,177.92 As per details in Annexure B-I		
Schedule-B-II			
3	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-II (Approx. basic cost Rs. 68,19,225.70 As per details in Annexure B-II		
Schedule-B-III			
4	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-III (Approx. basic cost Rs. 26,67,933.50 As per details in Annexure B-III		
Schedule-B-IV			
5	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-IV (Approx. basic cost Rs. 13,28,500.00 As per details in Annexure B-IV		
Schedule-B-V			
6	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-V (Approx. basic cost Rs.1,64,611.68 As per details in Annexure B-V		
Schedule-B-VI			
7	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-VI (Approx. basic cost Rs. 6,95,98,114.50 As per details in Annexure B-VI		
Schedule-B-VII			
8	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-VII (Approx. basic cost Rs. 0.00 As per details in Annexure B-VII		
Schedule-B-VIII			
9	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-VIII (Approx. basic cost Rs.81,41,352.77) As per details in Annexure B-VIII		
Schedule-B-IX			

ban

10	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-IX (Approx. basic cost Rs. 8,07,549.40 As per details in Annexure B-IX		
Schedule-B-X			
11	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-X (Approx. basic cost Rs. 9,44,956.66 As per details in Annexure B-X		
Schedule-B-XI			
12	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-B-XI (Approx. basic cost Rs. 0.00) As per details in Annexure B-XI		
Schedule-B-XII			
13	Overall percentage above/below/at par over the rates under unforeseen items based on USSOR 2012. (Approx. basic cost Rs. 1,00,00,000.00) As per details in Annexure B-XII.		
Schedule-C-I			
14	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-C-I (Approx. basic cost Rs. 4,77,02,025.02 As per details in Annexure C-I.		
Schedule-C-II			
15	Over all percentage above/below/at par over the basic rates of ECR USSOR-2012 under Annexure-C-II (Approx. basic cost Rs. 9,93,08,687.50 As per details in Annexure C-II.		

Notes: -

1. Rates shall have to be quoted as percentage above or below for each schedule separately. Tenderers must not quote item wise rates. In case any tenderer quotes unified percentage for each schedule and also quotes item wise rates against individual items, no cognizance would be taken for the item wise rates quoted by the tenderers. However, railways reserves the right to cancel any tender wherein item wise rates has been quoted.
2. If any tenderer(s) wishes to give any rebate on the above rates quoted by him, the same shall be quoted by him in schedule-D attached. Rebate offered, shall apply in all the above schedules.
3. The measurement of the work for the purpose of payments to be taken by the contractor for works executed in all respect as per contract specification and conditions and submitted to Railway along with all field data ,test certificates and other relevant records.. The Railway's Engineer will get it checked and arrange to pass for payment as payable. If the measurement is found to be wrong/ erroneous, for the first time , a warning will be given to the contractor in writing and measurement will be got corrected. If the, mistakes in measurement are found for the second time and onwards a penalty of ½% of the gross value of the bill will be deducted from the bill.
4. The tenderer has to submit QAP within 15 days of issue of LOA for approval of Railway. The tenderer will have to follow the same and submit monthly statement/test report duly test checked by the Railway.
5. The engineers/Technical personnel deployed at site should have experience of similar nature of work costing 35% of tendered value. This should be mentioned in the list of technical personal.

Witness: -

1.

Signature of tenderer

2.

Dated:_____


**EAST CENTRAL RAILWAY
(Construction Department)**

Schedule – ‘D’

(REBATE)

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

I/we offer general rebate of-----% (In figures) % -----
----- (in words) as lump sum rebate on all items of all schedules (viz. Schedule “A-I to C-II”) of this tender Schedules;

NOTES:

1. If any tenderer wishes to give any rebate on the rates quoted by him, the same can be filled by him in this schedule.
2. It is to be noted that such rebate if offered, shall apply on the rates quoted for all the items in all the other Schedules of the tender documents. Such a rebate shall be totally unconditional.
3. In case a tenderer does not wish to give any rebates, he should write ‘NIL’ in this schedule. In case nothing has been filled in by the tenderer in this schedule it will be treated as ‘NIL’ and shall be so recorded in the blanks above at the time of opening of the tender by the officials opening the tenders.
4. If any tenderer gives any type of conditional rebates, such rebate shall not be considered for evaluation of the tender.

Witness

- 1.
- 2.

Signature of Tenderer

dated: _____

bu

**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Sl No	Description of work	Unit	Rate	Qty.	Amount
1	Supply at site provided quality moorum/stone dust/quarry dust suitable as blanketing material upto 100Cm thick as per RDSO specifications in 250mm thick layers for Railway formation and laying the same as per RDSO GUIDELINES on top of newly constructed embankment in the approved profile, compacting the same by mechanical means including sprikling of water if required complete in all respect.	1 Cum	587.82	70,000	4,11,47,116.99

Witness:-

- 1.
- 2.

Signature of tenderer
Dated: _____



**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Sl No	Description of work	Unit		Rate	Qty.	Amount
1	Earthwork in cutting (classified) in formation, trolley refuges, side drains, level crossing approaches, platforms, catch water drains, diversion of nallah & finishing to required dimension and slopes to obtain a neat appearance to standard profile inclusive of all labour, machine & materials and removing & leading all cut spoils either to make spoil dumps beyond 10m from cutting edge or for filling in embankment with all leads within the section limit, lifts, ascent, descent, loading, unloading, all taxes/royalty, clearance of site and all incidental charges, bailing & pumping out water, if required, etc. complete as per directions of the Engineer-in-Charge. The work is to be executed as per latest / updated edition of "Guidelines for Earthwork in Railway Projects" issued by RDSO, Lucknow. Cut trees shall be property of Railways and to be deposited in the railway godown unless specified otherwise in the Special Conditions of Contract					
	Note - (i) All usable earth arising from cut spoils shall be led into bank formation and Unusable spoils shall be dumped / stacked (ii) All hard rock /and boulders not fit for filling will be stacked by the contractor and will be property of the Railways.					
1(a)	In all conditions and classifications of soil except rock	1	Cum	163.81	1,00,000	1,63,81,000.00
1(b)	In hard rock requiring blasting with explosives and blasting/drilling equipment Including all incidentals work in all conditions. Rate includes cost of all explosive material.	1	Cum	440.37	30,000	1,32,11,100.00

2	Earthwork in filling in embankment, guide bunds, around buried type abutments, bridge gaps, trolley refuges, rain bunds, if provided, platforms etc. with earth excavated from outside railway boundary entirely arranged by the contractor at his own cost as per RDSO's latest guidelines and specifications and special condition of contract including all leads, royalty, lifts, ascents, descents, crossing of nallahs or any other obstructions. The rates shall include all dressing of bank to final profile, demarcation and setting out of profile, site clearance, removing of shrubs, roots of vegetations growth, heavy grass, benching of existing slope of old bank, all handling/re-handling, taxes, octroi and royalty etc. as a complete job. Cut trees shall be property of railways and to be deposited in the railway godown unless specified otherwise in the Special Conditions of Contract.	1	Cum	139.23	4,58,300	6,38,09,109.00
3	Extra for mechanical compaction of earth/blanketing material filled in embankment with contractor's rollers of suitable capacity, type and size to achieve specified density as per specification, testing as per IS codes including cost of water, T&P, consumable material and all labour as a complete job. The work is to be executed as per Latest edition of "Guidelines for Earthwork in Railway Projects" issued by RDSO, Lucknow.	1	Cum	14.80	5,58,380	82,64,024.00
4	Turfing / planting, including all lead & lift and watering as required until properly rooted with. Note - Initially payment of only 40% will be made. Balance 60% will be paid only after 3 months of maintenance period, if the turfing is properly rooted.					
4(a)	Turfing with planted doob grass	100	Sqm	4436.24	63,300	28,08,139.92
5	Feldling trees of Girth (measured at a height of 1m above ground level) including lead and stacking of material within 100m					
a)	Girth over 30cm and upto 60 cm	1	Each	106.60	250	26,650.00
b)	Girth over 60cm and upto 1.5 m	1	Each	298.80	350	1,04,580.00
6	Earth work in excavation as per approved drawings and dumping at embankment site or spoil heap, within railway land, including 50m lead and 1.5m lift, the lead to be measured from the centre of gravity of excavation to centre of gravity of spoil heap; the lift to be measured from natural ground level and paid for in layers of 1.5m each including incidental work, as per specifications	1	m3	93.54	5000	4,67,700.00
7	Extra for manual compaction of earthwork, where permitted, with rammers	1	m3	7.40	5000	37,000.00
8	Extra for lead of earth work above initial lead of 50m in all kind of soils and rocks :					
(a)	For every 50 m or part thereof - lead over 50m and upto 150m	1	m3	10.85	2500	27,125.00
(b)	For every 50 m or part thereof - lead over 50m and upto 150m	1	m3	10.30	2500	25,750.00

	Basic cost of Sch-BI (Rs)	10,51,62,177.9 2
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Note:-

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- (3) In case of any discrepancy in item details/ rates /unit and item reference of ECR USSOR 2012 as mentioned in this schedule, the corresponding provisions of the ECR USSOR 2012 shall prevail and the decision of the Railway in this regard shall be final and binding

Witness:-

- 1.
- 2.

Signature of tenderer**Dated:** _____

B-II

**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Sl No	Description of work	Unit	Rate	Qty.	Amount	Item No.	
1	Providing and laying cement concrete, up to plinth in retaining walls, walls (any thickness) including attached plasters, columns, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc, excluding the cost of cement and of shuttering, centering.					31020	
1(a)	1:2:4 (1 cement : 2 sand : 4 graded stone aggregate 20mm nominal size)	1	Cum	2,911.03	2,110	61,42,273.30	31023
2	Providing and fixing at or near ground level, Precast M 20 grade cement concrete as per approved design and setting in position with cement mortar 1:3 (1 cement : 3 coarse sand), including the cost of required centering and shuttering complete but excluding the cost of cement (cast at site)					032030	
2(a).	In ash pit stones, platform coping stones etc.	1	M3	3,526.11	115.00	4,05,502.65	032032
3	C.C. bed stone.	1	m3	3,619.33	10.00	36,193.30	041012.
4	R.C.C. M-20 in lintel	1	m3	3,619.33	10.00	36,193.30	041012.
5	R.C.C. M-20 in chajja & fins	1	m3	3,619.33	10.00	36,193.30	Do
6	R.C.C. M-20 in beam	1	m3	3,619.33	10.00	36,193.30	Do
7	R.C.C. M-20 in roof slab.	1	m3	3,619.33	25.00	90,483.25	Do
8	R.C.C. M-20 in stair case, slab, steps, beam.	1	m3	3,619.33	10.00	36,193.30	Do
Total Cost of Sch B-II						68,19,225.70	

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Witness:-

1.

Signature of tenderer



2.

Page 68 of 128
Dated: _____

by

**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

SI No	Description of work	Unit		Rate	Qty.	Amount	Item No.
1	E/Work in excavation in foundation.	1	m3	93.54	875.00	81,847.50	011011.
2	Brick flat soling single layer	1	m2	237.25	200.00	47,450.00	091032.
3	CC 1:3:6 in foundation.	1	m3	2,537.86	125.00	3,17,232.50	031012.
4	R.C.C.M-20 in foundation.	1	m3	3,341.60	25.00	83,540.00	041011.
5	Brick work 1:6.	1	m3	2,880.95	450.00	12,96,427.50	051018.
6	Sand filling in plinth.	1	m3	680.04	125.00	85,005.20	252150.
7	RCC M-20 in plinth band.	1	m3	3,619.33	10.00	36,193.30	041012.
8	Brick work 1:6.	1	m3	2,880.95	125.00	3,60,118.75	051018.
9	Brick work 1:4.	1	m3	2,880.95	125.00	3,60,118.75	051017.
Total Cost of Sch-B-III						26,67,933.50	

Note:-

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Witness:-

- 1.
- 2.

Signature of tenderer

Dated: _____

bu

**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

SI No	Description of work	Unit	Rate	Qty.	Amount	Item No.
1	Providing, erecting and fixing Ballies of locally available species approved by the zonal railway in posts, purlins, rafters, etc., including cost of iron nails and spikes required and supplying & applying wood preservative to exposed surfaces					74330
(a).	100mm dia. ballies	1 m	25.00	18720	4,68,000.00	74332
2	Plaster 1:6 12mm th.	1 m2	16.00	2,000.00	32,000.00	111012
3	Ceiling plaster 6mm th.	1 m2	20.00	1,000.00	20,000.00	111170
4	Kota stone floor/skirting 20mm th.	1 m2	270.00	750.00	2,02,500.00	,096061
5	Ceremic tiles	1 m2	155.00	40.00	6,200.00	,095011.
6	White wash 2 coats.	1 m2	20.00	5,000.00	1,00,000.00	115011
7	Colour wash	1 m2	20.00	4,000.00	80,000.00	115031
8	Snowcem exterior	1 m2	40.96	5,000.00	2,04,800.00	115110
9	Paintng steel works	1 m2	15.00	1,000.00	15,000.00	121030
10	Painting wood work	1 m2	15.00	1,000.00	15,000.00	121020
11	Door frame sal wood	1 Cudm	20.00	100.00	2,000.00	,071012.
12	Wooden flush door leaf	1 m2	630.00	60.00	37,800.00	,072141.
13	Waterproofing over roof	1 m2	66.00	2,200.00	1,45,200.00	,109060.
Total Cost of Sch-IV					13,28,500.00	

Note:-

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Witness:-

- 1.
- 2.

Signature of tenderer

Dated: _____

V

**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

No	SI Description of work	Unit		Rate	Qty.	Amount	Item No.
1	W/C pan/comode	1	Each	3,037.77	2.00	6,075.54	,151021.
2	Wash basin 550 x 400	1	Each	2,063.99	2.00	4,127.98	,151073.
3	Cistern	1	Each	1,087.32	2.00	2,174.64	,151182.
4	Urinal	1	Each	835.01	2.00	1,670.02	,151260.
5	Ventilator	1	LS			-	LS
6	C.I. S.W. pipe 150mm dia	1	m	278.63	25.00	6,965.75	,141012.
7	P.V.C. R.W. bend 110mm dia	1	Each	94.71	10.00	947.10	,154100.
8	P.V.C. R.W. pipe 110mm dia	1	m	264.69	10.00	2,646.90	,154010.
9	G.I. pipe						
10	50mm dia	1	m	488.47	125.00	61,058.75	,131136.
11	25mm dia	1	m	240.12	125.00	30,015.00	,131133.
12	20mm dia	1	m	200.20	125.00	25,025.00	,131132.
13	15mm dia	1	m	138.68	125.00	17,335.00	,131131.
14	Cintex tank 4000 ltrs.	1	Litre	6.57	1,000.00	6,570.00	,136150.
Basic cost of Sch-B-V (Rs)						1,64,611.68	

Note:-

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Witness:-

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Signature of tenderer

Dated: _____

East Central Railway
(Construction Department)

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

SI No	Description of work	Unit		Rate	Qty.	Amount	Item No.
1	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast in-Situ) in bottom/top slab, side walls, toe wall and sumps haunch filling head walls or any other component using 20mm graded crushed stone aggregate and coarse sand of approved quality of cast in-situ RCC box of size upto 5m (bigger inside dimension) including finishing, Admixtures in recommended proportions (as per IS:9103), if approved in Mix design, to accelerate, retard setting of concrete, improve workability without impairing strength and durability, complete as per drawings and technical specifications as directed by Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra.	1	Cum	2,745.77	12,780.00	3,50,90,940.60	194010-241
2	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Mass Cement Concrete M-20 grade (cast in-situ) using 20mm graded crushed stone aggregate and coarse sand of approved quality in Drop and curtain wall and alike structures below bed level , including the cost of centring, shuttering and finishing complete as per drawings and technical specifications as directed by Engineer. Payment for cement & reinforcement shall be paid extra.	1	Cum	2,745.77	1,560	42,83,401.20	194020-241
3	Centring and shuttering including strutting, propping etc. and removal of form for :						
3(a)	Abutment, pier, wing walls and return walls	1	Sqm	227.40	9,750	22,17,150.00	195032-241
3(b)	In Bottom/top slab, side walls, toe wall and sumps haunch filling head walls or any other component	1	Sqm	227.40	35,180	79,99,932.00	195038-242

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4	Earthwork in excavation for foundations and floors of the bridges, retaining walls etc. including setting out, dressing of sides, ramming of bottom, getting out the excavated material, back filling in layers with approved material and consolidation of the layers by ramming and watering etc. including all lift, disposal of surplus soil upto a lead of 300m, all types of shoring and strutting with all labour and material complete as per drawing and technical specification as directed by Engineer in charge						
4(a)	All kinds of soils	1	Cum	292.93	16,270	47,65,971.10	192011-234
4(b)	Hard rock (requiring blasting)	1	Cum	411.06	545	2,24,027.70	192013-234
5	Providing Boulder Backing behind wing wall, return wall, retaining wall with hand packed boulders & cobbles with smaller size boulders toward the back including all lead, lift, labour & other incidental charges as complete work in all respect. Payment for boulder/cobbles will be done extra.	1	Cum	168.19	6,460	10,86,507.40	222290-258
6	Providing and laying pitching with stone boulders weighing not less than 35kg each with the voids filled with spalls on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications (filter media to be paid separately under the relevant item)	1	Cum	1,066.06	8,135	86,72,398.10	221050-252
7	Providing and laying Filter Material as per RDSO Specifications underneath pitching in slopes complete as per drawing and Technical specification	1	Cum	2,626.05	540	14,18,067.00	221070-252
8	Providing and laying of filter media consisting of granular materials of GW, GP, SW groups as per IS:1498-1970 in required profile behind boulder filling of abutments, wing walls / return walls etc. above bed level with all labour and material complete job as per drawing and technical specification of RDSO Guidelines	1	Cum	943.42	4,070	38,39,719.40	221080-253
Total Rs.						6,95,98,114.50	

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Signature of tenderer

Dated: _____



East Central Railway
(Construction Department)

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Sl No	Description of work	Unit		Rate	Qty.	Amount	Item No.
1	Preparation of subgrade by excavating earth upto 22.5cm depth, dressing to camber and consolidating with power road roller of 8 to 12 tonne capacity including making good the undulations etc. and disposal of surplus earth with lead upto 50m	1	Sqm	38.41	2,000.00	76,820.00	231010
2	Consolidation of subgrade with power road roller of 8 to 12 tonne capacity including making good the undulations etc. with earth or quarry spoils etc. and re-rolling the subgrade	1	Sqm	1.50	4,000.00	6,000.00	231020
3	Providing and laying water bound macadam with specified stone aggregate, stone screening and binding material including screening, sorting, spreading to template and consolidation with power road roller of 8 to 10 tonne capacity etc. complete						231040
4	Base course with 63mm to 45mm size including stone screening 13.2mm size	1	Cum	1,691.15	4,000.00	67,64,600.00	231042
5	Providing and laying bitumen penetration macadam with hard stone aggregate, with bitumen of suitable penetration grade including required key aggregate as specified, spreading coarse aggregate with the help of self propelled / tipper tail mounted aggregate spreader and applying bitumen by a pressure distributor and then spreading key aggregate with the help of aggregate spreader complete including consolidation with road roller of minimum 8 to 10 tonne capacity						231060

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6	For 50mm compacted thickness using 6cum coarse aggregate of size 50mm-20mm graded, 1.5cum key aggregate of size 12.5mm graded, and 500kg paving asphalt 80/100 per 100sqm	1	Sqm	324.50	1,250.00	4,05,625.00	231061
7	Providing and laying 2.5cm premix carpet surfacing with 3cum of stone chippings 10mm nominal size and 288kg bitumen emulsion (medium setting min. 65% bitumen content) complying with IS:8887-1995 per 100sqm including consolidation with road roller etc. complete	1	Sqm	172.48	4,000.00	6,89,920.00	233050
8	Moorum flooring 10cm thick (consolidated depth) including watering and ramming, with contractor's moorum	1	Sqm	102.79	1,930.00	1,98,387.77	091070
		Basic cost of Sch-BVIII (Rs)				81,41,352.77	

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Signature of tenderer**Dated:** _____


**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

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Sl No	Description of work	Unit		Rate	Qty.	Amount	Item No.
1	Supply of Local sand / Pit sand / Yamuna sand for filing purposes	1	Cum	607.18	1,330	8,07,549.40	252140
Basic cost of Sch-BIX (Rs)						8,07,549.40	

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Sl No	Description of work	Unit		Rate	Qty.	Amount	Item No.
1	Aluminium windows	1	Kg	353.56	2,500.00	8,83,900.00	,082012.
2	M.S.grill	1	Kg	84.72	300.00	25,416.00	,074232.
3	Collapsible gate 25m2	1	Sqm	3,240.06	11.00	35,640.66	,081180.
Basic cost of Sch-BX (Rs)						944956.66	

Note:-

- (1) Only one percentage is to be quoted.
- (2) The item description as given is only brief and work is to be executed as per the detailed description and specifications available in ECR USSOR 2012 and Indian Railways Unified standard specification for works and materials.
- (3) In case of any discrepancy in item details/ rates /unit and item reference of ECR USSOR 2012 as mentioned in this schedule, the corresponding provisions of the ECR USSOR 2012 shall prevail and the decision of the Railway in this regard shall be final and binding

1.
2.

Signature of tenderer
Dated: _____



**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Schedule-BXII (Unforeseen item based on USSOR-2012)					
SN	DESCRIPTION OF WORKS	Unit	Rate	Basic Cost (Rs.)	Amount
1	Overall percentage increase/decrease over the rates under Dhanbad division of East Central Railway, Engineering Department, USSOR - 2012 for items not included in any schedules from B-I to BXI,C-I & C-II	% above/ below/ at par	0.00%	1,00,00,000.00	1,00,00,000.00

NOTES:-

- (1) Any item of chapter of ECR USSOR, 2012 not included in any of the existing schedule 'B', mentioned above, can be executed under this Schedule.
- (2) Only one percentage is to be quoted on summary sheet.
- (3) Under this schedule work will be executed only after work order is issued with the approval of competent authority (concerned Dy.CE/Con/DHN).
- (4) The item description as given is only brief and work is to be executed as per the detailed description and specifications available in ECR USSOR 2012 and Indian Railways Unified standard specification for works and materials.
- (5) In case of any discrepancy in item details/ rates /unit and item reference of ECR USSOR 2012 as mentioned in this schedule, the corresponding provisions of the ECR USSOR 2012 shall prevail and the decision of the Railway in this regard shall be final and binding.

Witness:-

- 1.
- 2.

Signature of tenderer

Dated: _____

**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

Sl. No.	Description of work	Unit	Quantity	Basic Rate (Rs)	Basic Amount (Rs.)	Remarks
	Supply and using cement at worksite :					
	OPC 43 Grade	1 MT	7,193	6631.36	4,77,02,025.02	033061
	or					
	PPC	1 MT	7,193	6400.9	4,60,44,234.06	033063
	(PPC will be used only if OPC 43 grade is not available and to be certified so by manufacturer. For comparative statement to ascertain the inter-se tender position the rate of OPC 43 grade will be considered.)					
	Total Cost of Sch. C-I				4,77,02,025.02	

Note:-

- Material as per requirement shall be brought to site and kept under contractors custody at his own cost and risk without any damage like setting of cement rusting of steel etc.
- Payment for the materials will be made through running and final bills as per actual consumption in the work and whatever the wastage that takes place i.e. cut pieces, empty cement bags etc. will be the contractors property and the same shall be removed from the site at his own cost.
- Cement is to be procured from the main producer/ authorized dealers and shall conform to latest IS (BIS) specifications. Cement bags preferably be in paper bags should bear following information's in legible marking.
 - Manufacturers name
 - Registered trade mark of manufacture, if any
 - Type of cement
 - Weight of each bag in kg. or no. of bags/ ton
 - Date of manufacture generally marked as well as month/year of manufacture
 - It will bear the ISI certification mark.
- Manufacturers test certificate conforming to latest IS specification should be produced by the contractor, duly authenticated by the gazetted officer of the Engineering department.
- Contractor shall also establish his own field laboratory equipped with apparatus, duly manned for carrying out the following tests of the cement according to relevant IS (BIS) specifications.
 - Compressive and tensile strength
 - Initial and final setting time
 - Consistency
 - Soundness
 - Fineness modules
- The Railway reserves the right to take samples of materials supplied by the contractor and to get the same tested in reputed laboratories and the results thereof shall be binding on the contractors.
- Cement should be used within three months of its manufacture and set and clodded cement is not to be used

Witness:-

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Signature of tenderer

Dated: _____



Annexure- C-II

**East Central Railway
(Construction Department)**

Tender No. 02 of 2016-17 (Open)/South in two packet system

Name of work: Earth Work in Cutting, filling, compactions, blanketing, turfing, construction of minor bridges, Limited Height Sub-way, supplying and fixing various Board, Land Boundary pillars, bridge inspection steps, S & T buildings and other associated works as per Railways' specification and standards between Garhwa (Including Garhwa Yard) and Meralgram (Excluding Meralgram Yard) in connection with doubling between Garhwa Road and Ramna under Dhanbad Division of East Central Railway.

S/N	Description of work	Unit	Quantity	Basic Rate (Rs)	Basic Amount (Rs)
1	Supplying reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete -				
(i)	Thermo-Mechanically Treated bars	Kg	1540625	64.46	99308687.50
Total basic cost of Schedule C-II					99308687.50

Note:

1. Material as per requirement shall be brought to site and kept under contract's custody at his own cost and risk without any damage like rusting of steel etc.
2. Payment for the materials will be made through running and final bills as per actual consumption in the work and whatever the wastage that takes place i.e. cut piece etc will be the contractor's property and the same shall be removed from the site at his own cost.
3. All Reinforcement Steel (TMT Bars) and Structural Steel shall be procured As per Specifications mentioned in BISs documents - IS:1786 and IS:2062 respectively. Independent tests shall be conducted, wherever required, to ensure that the materials procured conform to the Specifications.
These steel shall be procured only from those firms, which are Established, Reliable, Indigenous & Primary Producers of Steel, having Integrated Steel Plants (ISP), using iron ore as the basic raw material and having in-house iron Rolling facilities, followed by production of liquid steel and crude steel, as per Ministry Of Steel's guidelines.
However, only certain isolated sections of structural steel, not being rolled by ISPs, can be procured from the authorized re-rollers of ISPs or authorized licensee of BIS having traceability system and who use billets produced by ISPs. Traceability shall be ensured by an officer specially authorized by the concerned SAG officer of the Zonal Railway on case to case basis for this purpose."
4. The Railway reserves the right to take samples of materials supplied by the contractor and to get the same tested in reputed laboratories and the results thereof shall be binding on the contractors.

Witness:-

- 1.
- 2.

Signature of tenderer

Dated: _____



**East Central Railway
Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna - 800 004**

SPECIAL CONDITION & SPECIFICATION FOR EARTHWORK.

1. GENERAL

- 1.1 Earthwork shall be done generally in accordance with provision of General Conditions of Contract and East Central Railway Standard Specifications for Works and materials-2008.
- 1.2 The book “ Guide line for Earthwork in Railway Projects” Guide line (GE:G-1) issued by Geo-technical wing of RDSO in July 2003 known here under, as “RDSO guidelines” shall form the basis of principles for conducting all testing and execution of work of embankments. A copy of this book can be purchased from the office of Chief Admin. Officer (Con), East Central Railway, Patna at a price of Rs 100/-.
- 1.3 Standard sections for Earthwork in formation, cutting, blanketing for single line, double line conventional doubling are given in the Indian Railways Permanent Way Manual 2004 and Indian Railways Code for Engineering Dept. 1993, which are Government of India’s priced publications. However, a set of such standard sections can be purchased from the office of Chief Admin. Officer(Con), East Central Railway, Patna at a price of Rs 100/-. These sections are for guidance of contractor to assess the type of work involved but the actual dimensions/side slopes etc. may vary to some extent depending on local conditions.
- 1.4 Where these conditions and specifications are in conflict with or repugnant to the East Central Railway Standard Specifications and/or other books mentioned as Book of Reference in this tender document, the clause of these Special Conditions and Specifications shall prevail.

2. EARTHWORK.

- 2.1 Before the work is started, the whole area between the toes of the bank or top of cutting shall be properly cleared by the contractor of all Trees, Roots, Heavy grass and all obstructions. No extra payment will be made for such work. All trees of girth (parameter) more than 12 inch at 1 meter above the bottom shall be the property of the Railway and the Contractor shall, after uprooting, deposit the same with Railway. Before cutting trees, necessary permission required from the forest department or any other appropriate authority, shall be taken, by the contractor on the basis of Railway’s recommendatory letter.
- 2.2 (a) Where an embankment is being extended in width, the slope of the existing embankment shall be benched as per specification of GCC and the cost for the same shall be included in the through rate and shall not be payable separately.
(b) Before commencing the work, Labeling as specified in GCC & East Central Railway Standard Specifications for Works and materials-2008 shall be done.

3. PAYMENT.

- 3.1 Payment shall be made on finished cross sectional quantities, cross sectional areas at various points shall be worked out and the arithmetic mean of the areas, at any two such continuous points multiplied by the horizontal distance between these two points measured along the centerline of the alignment shall be taken as the quantity of earthwork between the two points on which the payment shall be made. The contractor shall have no claim for the quantities over and above the payments on account of subsidence, base settlement, wastage or guttering due to rain, floods, wind, wave wash etc. All bridges and other gaps shall be deducted in full from the quantity of the earthwork.
- 3.2 SETTLEMENT ALLOWANCE: Where the embankment is compacted to specified dry density mentioned hereunder, no allowance for settlement of the bank shall be made, where the bank has
- 3.3 been formed by dumping earth, light tamping, and/or passing a monsoon over it, necessary allowances for settlement as specified in the GCC shall be made.
- 3.4 All payments shall be made in accordance with items given in the “Schedule of Items” only. Any arrangements/works required to be done to achieve the work defined in various Items of the “Schedule of Items” shall be done at contractor’s cost without any extra payment and the Contractor should include such expenses in the rates quoted against the said items.
- 3.5 While making embankment, earth shall not be dumped in any standing water at the location where embankment has to be constructed. If there is any standing water, the same shall be drained or pumped out completely before any earth is dumped in this area. In case of draining out or pumping out water, no extra payment will be made to the contractors and quoted rates for earthwork shall cover all such charges.



- 3.6 There shall be only two classifications of soil, e.g. (a) All types of soil except those requiring blasting for excavation (b) those requiring blasting. All the payments for excavations in cuttings shall be made as per the Schedule of Items only on the basis of these two classifications.
- 3.7 LEAD / LIFT etc.: No separate lift / crossing of line or similar item shall be payable separately otherwise than provided in the Schedule of items. Lead shall be payable as provided in the Schedule of Items.
- 3.8 Lead for the purpose of payment will be measured on a longitudinal section of the alignment from center of gravity of the Cut to the center of the gravity of the fill, along a straight line. Measurements of distance of lead shall not be done at site even if the contractor does not or is unable to follow this straight line. The assessment of lead is a drawing table exercise. The L-section shall be divided into segments, each of appropriate and suitable length, and volume of earthwork in each segment calculated.
- Segments of cut and fill will then be matched and lead measured from L-section from center of gravity of cut to center of gravity of fill, in such a way that the total amount payable on the lead is the least. For this purpose, spoils are not to be lead across obstruction caused by waterways with major bridges unless a road bridge exists by the side of the alignment. Waterway with minor bridges shall be ignored because contractor is expected to build temporary culverts across them on its own cost for leading spoils. It is desirable that the contractor before commencing work draws the lead chart in L-section based on the above guidelines and tentatively decides lead and fills area. The contractor shall try to stick to this lead during execution of the work. The contractor in his rate, if any, shall cater for variations.
- 3.9 The spoils from cuttings shall normally be utilized for earthwork in embankment. Where the cutting spoil has been used for making embankment, payments shall not be made for both cuttings as well as embankments. Only one payment, i.e., for cutting shall be allowed. However, lead over free lead (100 M) will be paid separately as provided in the schedule of the work. Surplus, unsuitable spoils shall be dumped in neat stacks on Railway land or disposed off as directed by Engineer at site for which no extra payment will be made.
- 3.10 Stone excavated from cuttings, which may be considered useful for use as building stone, for pitching or for breaking into ballast or chips shall be stacked separately by the contractor as directed by the Engineer at site. This stone will be property of the Railway and may be issued as Railway materials to the contractors as pitching etc. in accordance with relevant Item of L&M Schedule.
- 3.11 If any service roads, culverts, bridges etc. are to be built, the contractor shall build the same at his own cost., including ramps for transporting earth to make embankment, all the service roads are to be maintained by the contractor at his own cost. No separate payment for such works shall be made.
- 3.12 The contractor shall break all clods / lumps of soil and fill up all hollows in the earthwork in embankment by light tamping / consolidation which may be achieved by a few passes of plate vibrator or a suitable type of roller. The rates in items in earthwork in embankment shall include this.
- 3.13 The contractor may be asked to use Geo-Synthetics / Geo textiles in the embankment if it is found that the use of Geo-synthetics reduces the overall cost considerably. In such an event, special rates and conditions shall be separately negotiated with the contractor, but the contractor shall have no claim for reduction in quantities of other items. At the time of such negotiations, the Railway shall obtain a "No Claim "certificate to this effect. The Railway also reserves the right to get the installations of the Geo-synthetics / Geo textiles etc. executed through other agencies
- 3.14 The borrow pits shall be kept sufficiently away from the toe of the embankment to prevent base failures. The contractor may carry out a stability analysis to decide the distance. In case such analysis is not done, this distance of borrow pits from the toe of the bank shall be minimum of 3.0 meter + height of the bank.
- 3.15 The work of bolder pitching, turfing etc. Shall be carried out under ECR/SOR 2008 unless other wise specified.
- 3.16 Turfing shall be done during monsoon period only. The contractor shall take care of the turfing including watering of the turfing, in case of failure of monsoon, till the sods/seeds take firm roots. The sods/seeds shall be of approved quality.
4. **SOIL EXPLORATION/ TESTING**
- 4.1 The contractor shall arrange for testing of the soil at his own cost without any extra payment for every 500 m to ascertain the suitability of the soil for formation of embankment, to obtain its heavy proctor density characteristic and to obtain strength parameters such as cohesion (C) and angle of internal friction 'φ' etc of the soil in the compacted / un-compacted conditions in the embankment in order to design slopes. The testing of the soil to be done in accordance with the following RDSO guidelines

4.2 SOIL EXPLORATION TO BE DONE AS UNDER.

- (A) Cutting (> 6.0 m depth) .
- (1) Bore logs: (Depth = Depth of cutting + 3.0 minimum)
 - (2) Collection of undisturbed soil samples: 100 mm diameter at every 1.5m interval or change of strata.
 - (3) Laboratory tests of soil sample.
 - (a) Soil classification as per IS standard.
 - (b) Grain size analysis (clay, slit, sand and gravel %) including hydrometer analysis.
 - (c) Natural Moisture Contents (NMC)
 - (d) Natural Dry Density (NDD).
 - (e) Liquid limit, Plastic limit.
 - (f) Effective Shear Parameters. C = (effective cohesion), ϕ = (effective angle of shear resistance). Tests to be done in fully saturated condition:
 - (g) Tri-axial shear apparatus (CU) test: - Consolidated un-drained tests with pore pressure measurements Or
Direct shear test in consolidated drained condition (CD) test.
- (B) Embankment (> 6.0 m height)- Subsoil investigation.
- (1) Bore log (Depth =height of embankment)
 - (2) Collection of undisturbed soil samples 100mm diameter at every 1.5m intervals or change of strata.
 - (3) Standard penetration test (N-Value) at 1.5m intervals in a bore hole.
 - (4) Laboratory tests of soil samples.
 - (a) Soil classification as per IS standard.
 - (b) Grain size analysis (clay, slit, sand and gravel %) including hydrometer analysis.
 - (c) Natural Moisture Contents (NMC)
 - (d) Natural dry density (NDD).
 - (e) Liquid limit, Plastic limit.
 - (f) Effective shear parameters. C = (effective cohesion), ϕ = (effective angle of shear resistance). Tests to be done in full-saturated condition.
 - (g) Tri-axial shear apparatus (CU) test: - Consolidated un-drained tests with pore pressure measurements Or
Direct shear test in consolidated drained condition (CD) test.
- (C) Embankment (in swampy or in water logged areas even for height of embankment is less than 6.0m)
- (1) Soil exploration and testing as in the case of embankment of height more than 6.0m to ascertain the depth of soft strata.
 - (2) Laboratory test of soil samples.
 - (a) Soil classification as per IS standard.
 - (b) Grain size analysis (clay, slit, sand and gravel %).
 - (c) Natural Moisture Contents (NMC)
 - (d) Natural Dry Density (NDD)
 - (e) Liquid limit, Plastic limit.
 - (f) Effective shear parameters. C = (effective cohesion), ϕ = (effective angle of shear resistance). Tests to be done in full-saturated condition.
 - (g) Tri-axial shear apparatus (CU) test: - Consolidated un-drained tests with pore pressure measurements Or
Direct shear test in consolidated drained condition (CD) test.
 - (h) Consolidation test.
- (B) Fill Material: soil classifications and shear parameters are required to design the safe side slope.
- (a) Effective shear strength parameters (C & ϕ) in remolded condition at 90% of max. dry density as determined in accordance to IS : 2720-Pt.VIII (Heavy compaction). Tests are to be done in fully saturated condition.
 - (b) Soil classification as per IS standard.
 - (c) Grain size analysis (clay, slit, sand and gravel %) including hydrometer analysis.
 - (d) Liquid limit, Plastic limit.
 - (e) Compaction test to determine
 - Maximum Dry Density
 - Optimum Moisture Content (OMC) as per IS: 2720-Pt.VIII (Heavy compaction.).

(E) Slope stability: Based on soil survey and explorations locations showing signs of instability, creep, slips etc. should be analyzed by stability analysis with effective shear strength parameter ensuring a minimum factor of safety of 1.4. Bank or cutting with height / depth of 6.0m or more must be checked for stability of slopes.

4.3 The contractor shall also make arrangements for quality control of compaction of the embankment by establishing and manning adequate Field Laboratory (ies). The in-situ moisture content of compacted soil shall be determined according to the any one of the procedures given in IS: 2720 (Pt. II)-1973 . The Field dry density should be determined by any one of the methods given in IS: 2720 (Pt. XXVIII)-1974 or IS: 2720(Pt. XXIX) 1975 or IS: 2720 (Pt. XXXIV)-1972. The tests shall be performed after removing top 5cm layer of earth (IS: 10379-1982).

4.4 The contractor shall establish Field Laboratory (ies) to cover all the above investigation except triaxial and other test ascertaining strength characteristics, for which he may appoint any other centralized laboratory where he will get the tests done at his own cost.

4.5 The contractor shall submit samples of earth which he proposes to use for formation of the embankment along with relevant tests results as prescribed above to the Engineer before commencing earthwork and shall get the same approved by Dy.CE / in charge for use.

While approval of the sample for use, the consideration of particles size distribution shall, not be only consideration. The safe slope of the embankment as can be obtained from that sample of earth when compacted according to these specifications; total quantities required and over all economy shall also be considered while considering the suitability of the earth for embankment.

5. **DETERMINATION OF MAXIMUM DRY DENSITY:**

5.1 For clayey soils: the maximum dry density shall be determined by heavy proctor compaction test in accordance with IS: 2720(Pt. VIII)-1983. The dry density and moisture content relationship shall be obtained for a number of samples and shall cover moisture contents ranging from 2% less than the optimum moisture contents to plastic limit.

5.2 Sandy and silty soil: With moderate cohesion:

(a) Where the soil is amenable to compaction and satisfactory results are contained when compacted by heavy proctor test as per IS: 2720(Pt. VIII) 1983. The soil shall be treated like clayey soil in the manner mentioned above

(b) Where the soil is not amenable to test by heavy proctor test, field trial as per IS:10379 – 1982 shall be conducted to achieve moisture content, density and rolling relationship. Such moisture content should cover a range of high moisture content so that such relationship is available in quality control of compaction at higher moisture contents in accordance with Para below:

5.3 Gravelly soil : For gravel fraction up to 30% moisture content density relationship shall be obtained by heavy proctor test IS:2720 (Pt. VIII)-1974 on 40mm IS sieve (IS 10379 –1982)

5.4 Weathered soils: In certain weathered soils behavior to compaction in field differ from laboratory compaction characteristics and the maximum compaction achievable for such soil in the field shall be determined in accordance with provision of method 3 of IS ; 10379-1982.

6. **SUITABILITY OF EARTH FOR EMBANKMENT:**

6.1 Soils shall be used for the embankment with approval of Dy.CE/ Con subject to the following.

(a) Organic clay silts and peat shall not be used.

(b) Poorly graded sands and gravels with uniformity coefficient of less than 2 should not be used for earth work for the bank to safe guard against liquefaction under vibration of moving loads or especially during earthquake tremor.

(c) In gravelly soil, percentage of gravel shall not exceed 30%.

(d) In situations where soils for construction of embankment consist of cobbles, boulders, rocks or waste fragments etc largest size of material should normally not be greater than 2/3 rd of the loose layer thickness. However it should be ensured that after every 1 to 3 meter of such construction a 30cm layer of compacted soil (other than unsuitable soil for construction) be provided. A detailed slope stability analysis also needs to be carried out to ensure stability of such embankments. (Para No 5.2.2 of RDSO GUIDELINES FOR EARTHWORK IN RAILWAY PROJECTS)

(e) The soil shall be of “Low” “Potential expansivity” also called degree of expansion (refer IS: 2911- Part III). The differential free swell also called free swell index determine in accordance with IS:2720 part XI –1977 shall not exceed 20%.

6.2 Top 1m of the embankment shall be constructed with earth with liquids limit not exceeding 45 to avoid shrinkage, cracking of soil; etc. during change of weather. In case such soil is not available at a reasonable cost, the Engineer may permit the complete bank to be constructed out of the earth as available and increase the thickness of the blanketing suitably.

6.3 The moisture content of the soil, which the contractor brings to site for making embankment, should be appropriate for compaction as specified in these specifications, otherwise he has to make arrangement for adding extra moisture or drying the soil to achieve the desired moisture content.

6.4 **PREFERRED FIELD MATERIAL:**

- (i) Fine particles (less than 75 size) less than 50%.
- (ii) Liquid limit less than 35% and plastic index less than 15.
- (iii) Uniformity coefficient (C) greater than 7.
- (iv) Minimum achievable Dry Density with heavy compaction as per IS: 2720 Pt. VIII should be greater than 1.85 gm/cc.

7. **COMPACTION :**

7.1 Before work is commenced, the contractor is advised to conduct, field compaction trials for his own guidance so that compaction is efficiently and economically achieved. This trial should also be used to assess the thickness of the loose layer of soil that should be adopted for formation of the bank, as well as to determine the most efficient type of rollers. RDSO guidelines have given the suitable, type of roller and the same may be taken as guidance.

7.2 Water, if required, for adding to the earth shall be arranged free of cost by the Contractor himself.

7.3 The compaction of soil is essentially required for obtaining a uniform soil mass of desired density and known soil properties. The method of compaction should, therefore, be shown accordingly.

7.4 In cutting area the final surface shall be suitably compacted by suitable type of roller to achieve desired dry density/strength.

7.5 **SUITABILITY OF TYPE OF ROLLER:**

Type of soil	Suitable type of roller
Course grained soil such as gravels, sands and gravel sand mixtures with very little trace of fines	Rubber tyre roller, vibratory plate or smooth wheel roller.
Gravels or sands with appreciable amount of silt or clay	Rubber tyre roller, vibratory rollers, sheep foot rollers.
Silts and clays of low plasticity.	Rubber tyre roller, vibratory rollers, sheep foot roller.
Silts and clays of high plasticity.	Sheep foot rollers and vibratory rollers.

8. **METHOD OF COMPACTION OF EARTHWORK**

8.1 After site clearance all pockets and depressions left in the soil, if any, shall be made good and compacted. Generally Earthwork shall be done in layers not exceeding 300 mm thick in loose state and compacted with suitable roller to obtain the specified density as per IS: 10379 –1982. The number of passes of the roller and the optimum thickness of each layer will be fixed after carrying out field trials with the roller proposed to be used from time to time from location to location. The main criteria are being to obtain the maximum density achievable uniformly.

8.2 Cohesionless soils shall be compacted to get a minimum density index (relative density) of 70% as obtained in accordance with IS: 2720(Pt. XIV) – 1983.

8.3 All other types of soils when compacted shall attain at least 98% of the maximum dry density as determined using heavy compaction in accordance with IS: 2720 (Pt. VIII) – 1983 followed by field trials as per IS: 10379 – 1982. In case, there are difficulties in achieving 98% of the MDD values as obtained by Laboratory test, in the field trials, the same may be relaxed upto 95% of MDD with the specific approval of Chief Engineer/construction, recording reasons of such relaxation

8.4 If the soil is dry, water shall be sprinkled either in the borrow pit or over the spread layer, as convenient in order to obtain a workable moisture content before rolling is commenced. Where the natural moisture content of borrow pit is high, compaction in higher moisture contents can be allowed by the permission of Engineer-in-charge.

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

8.6 While compaction it shall be ensured that there is minimum overlap of 150 mm between each run of the rollers.

8.7 Care should be taken during the compaction operation to slope the surface of the bank to facilitate the shedding and to minimize the absorption of rainwater, particular attention being given to the prevention of ponding.

- 8.8 The Railway shall ascertain the density of each layer of compacted soil by testing adequate number of soil samples.
- 8.9 The quality of compaction work shall be determined by considering the Mean Density of the samples collected mostly on either side of the center line at intervals of 10 M or so with a few taken at random near the two sides in each layer. The Mean Dry Density shall be equal to or exceed the minimum specified density. In no individual case the density be less than the minimum value specified by more than 2% otherwise further rolling shall be done at the appropriate location.
- 8.10 The contractor shall be allowed to lay a further layer of soil only after the compaction of a particular layer has been found satisfactory.
- 8.11 The top of the formation shall be finished to a slope of 1 in 30 away from the centers.
- 8.12 Extra width of 50 cm shall be rolled on either side, which after finishing the bank up to final height shall be dressed to final cross section by removing the loose earth or extra width. No extra payment for this extra width shall be made
- 9. In parts to embankment which are inaccessible to the specified rolling equipment, e.g. around and in contact with culverts, abutments or in proximity to structure where rolling equipment will either not be possible to operate, or not permitted to operate, compaction shall be accomplished by hand tamping followed with plate vibrators or suitable mechanical means in layer of thickness not exceeding 150 mm. In such areas, the maximum dry density to be achieved as a result of compaction shall not be less than 90% of the maximum value achievable at that moisture content.

Witness

- 1.
- 2.

Signature of Tenderer

Dated: _____



East Central Railway
Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna- 800004

Special Condition & Specification for blanketing

1. GENERAL.

- 1.1 The book "Guidelines for Earth work in Railway Projects" issued by the Geotechnical Engineering Directorate of RDSO in May 1987 along with the latest amendment known here under as " RDSO' Guidelines" shall form the basis of principles for conducting all testing & supply and compaction of blanketing materials in the embankment. A copy of this book can be purchased from the office of Chief Administrative Officer (Con) / E .Central Railway for Rs. 25/-
- 1.2 Standard Section for blanketing on formation for single lines, double line, conventional doubling are given in RDSO guidelines and the Indian Railways Permanent Way Manual (1986) and Indian Railways code for Engineering Department (1993) which are Govt. of India's publications. However, a set of such standard section can be purchased from the office of Chief Administrative Officer (CON)/ East Central Railway, at a price of Rs. 25/-. These sections are for guidance of contractors to assess the type of work involved but actual dimensions, side slope etc. may vary to some extent depending on local conditions.
- 1.3 (i) The Tenderer may submit along with this tender paper a number of samples if he so chooses. Each sample may be associated with its test result and corresponding rate in the schedule of items. However, for each sample the exact location of the quarry from where the material is proposed to be brought should be indicated. the Railway administration will test all the samples submitted by the Tenderer to asses their quality for suitability as blanketing materials. The sample, which will not be approved, will be rejected and rates given by the contractor corresponding to such samples shall not be taken into account while considering various tender. The Railway Administration will consider the rates quoted by the Tenderer only two such samples as have passed the quality test. While issuing letter of acceptance in favor of successful Tenderer, the Railway Administration shall specify one or two cheapest approved sample along with their corresponding rate for bulk supply.
- (ii) It should be noted that cohesion less, non erodible materials shall have to be confined in earth trenches in accordance with approved plans.
- (iii) While selecting the samples for bulk supply, the Railway shall consider the total cost of blanketing including supply of materials, compaction and confining, if necessary the sample that gives the minimum total cost shall be accepted.
- 1.4 The contractor shall bring the bulk supply of blanketing materials according to approved sample and stack the same on the finished formation where the quality shall be checked. After approval of the quality the Contractor shall be allowed to spread the materials and start compaction.
- 1.5 The top surface of the formation shall not be damaged by the Contractor in the process of spreading the material of blanketing on the formation. Any damage done to the formation shall be made good (in necessary compaction) by the Contractor at his own cost.

2. QUALITY OF BLANKETING MATERIALS : The blanketing materials should satisfy the following properties :-

- 2.1 The materials should be coarse, granular and from hard rock.
- 2.2 The materials should have small quantity of fines. If the fines are plastic, the percentage of fines i.e., particles upto 75 microns should be up to 5%. If fines are non-plastic these should be up to 12%.
- 2.3 The materials should be properly graded and its particles size distribution curve should lie within the enveloping curves shown in sketch - B. (RDSO Guide lines)
- 2.4 Uniformity Co-efficient D_{60}/D_{10} should be above 4 and preferably above 7, Co-efficient of curvature = $(D_{30})^2/D_{60} \times D_{10}$ should be within 1 and 3.



3. METHOD OF LAYING

- 3.1 The blanket should generally cover the entire width of the formation from shoulder to shoulder except that in case of sand or similar erodible materials, it should be confined within beams of width 60cm to 75cm.
- 3.2 If erodible material is used as blanket it should be confined in a trench and sand drains should be provided across the cess to drain the track and the blanket (SK-C). These cross sand drains with adequate slope should be 5 to 10cm below the bottom of the blanket and spaced 2 to 4m apart.
- 3.3 The materials should be laid in layers of not more than 25 cm and each layer compacted to specifications before next layer is laid.

4. COMPACTION

- 4.1 All the blanketing material should be compacted by mechanical means. The method of compaction and appropriate type of rollers are suggested in RDSO guidelines. However, use of plate vibrator of ¾ tones capacity is recommended.

4.2 COHESIONLESS SOIL :

- (i) The control of moisture content is not important in this case. However, best compaction is achieved when the soil is very wet (near saturation). The compaction of such soil shall be done by adding sufficient water to it so that it compacts well and efficiently, does not slip away (when too dry) and also does not flow (when too wet) under rollers, such moisture content shall be determined by field trials.
- (i) In Cohesion less blanketing materials the blanket should be compacted to get minimum dry density index (relative density) of 70% as obtained in accordance with IS 2720 (Pt. XIV)/ 1983.
- 4.3 The quality of compaction shall be determined by considering the mean density of number of samples taken in each layer. The mean dry density shall be equal to or exceed the minimum density specified above. In no individual case, shall be density be less than the minimum value specified by more than 2% otherwise further rolling shall be done at the appropriate location.
- 4.4 The top of the blanket shall be finished to a slope of 1:40 away from the center of the formation. Each layer shall be compacted to the desired density over its entire width commencing from the both sides. There should be a minimum over lap of 150 mm, between each run of the roller

5. QUALITY CHECK IN FIELD :

- The contractor shall established laboratory at site with such equipment and personal in sufficient numbers for checking quality of the blanketing materials as well as for checking the quality of the compaction of the blanket. No separate payment shall be made to the contractor for this.
6. In case of cohesive blanketing materials, if required, it may also be confined with provision of sand drain with specific instructions of the Engineer at site
7. When dismantling of any existing structure is involved to facilities construction, the scheme for dismantling of the existing structure shall be submitted by the contractor and excess shall be done after approval of Railway.
- (a) The dismantling of structure should be done under proper supervision and as per approved scheme of dismantling
- (b). At major dismantling sites minimum level of supervision shall be Senior Section Engineer (In Charge), who should be nominated by Dy.Chief Engineer/in writing.
- (c) The dismantling Plan should be scrutinized by the Drawing Office and H.O.D. in case of Construction Organization. The dismantling Plan should invariably show various

stage of dismantling, equipments to be used for dismantling area likely to be affected by debris, any adjacent building likely to be affected and action to be taken thereof.

(d) Proper barricading should be done to stop access of unauthorized personnel near the dismantling area. Where ever necessary assistance of RPF should be taken to prevent people from coming close to dismantling area.. Sign Board warning people not to enter the danger zone should also be displayed by the contractor.

8. SAFE MEASURE: The following measures should be adopted to ensure safety of the train as well as work force.

(i) The contractor shall not start any work without the presence of railway supervisor at site.

(ii) Wherever the road vehicles and/ or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the Railway's schedule of dimensions. For this purpose the area where road vehicles and/or machinery are required to ply, shall be demarcated and acknowledged by the contractor. Special care shall be taken for turning/ reversal of road vehicles/machinery without infringing the running track. Barricading shall be provided wherever justified and feasible as per site conditions.

(iii) The look out and whistle caution orders shall be issued to the trains and speed restrictions imposed where considered necessary suitable flagmen/detonators shall be provided where necessary for protection of trains.

(iv) (a) He supervisor/workmen should be counseled about safety measures. A competency certificate to the contractor's supervisor as per Performa annexed shall be issued by AEN which will be valid only for the work for which it has been issued.

(b) 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.

(c) Supplementary site specific instructions wherever considered necessary, shall be issued by the Engineer-in charge.

Witness

1.

Signature of Tenderer

2.

Date _____



East Central Railway
Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna- 800004

SPECIAL CONDITION AND SPECIFICATION FOR BRIDGE WORKS

1. The tenderer are required to inspect the site and carry out careful examination so as to satisfy themselves as to the nature of work involved and facilities available at site. They should also note carefully all the existing structures and those under construction through other agency (if any), and should take adequate me protection to all such structures, including Railway track during course of execution of work under this contract. The rates quoted by the tenderer(s) and accepted by the Railway Administration must cover all such charges.
2. Railway land as existing and as sparable will be made available to the contractor free of charge for building their stores Godown, camp office, girder casting/fabrication yard etc. The contractor shall make their own arrangement at their cost for leveling and dressing the ground or developing the land.
3. **WATER:** Water required for the work and also for drinking purpose should be arranged by the contractor from his own source and at his cost. If water from Rly's source is available near the site of the work the Rly may supply the same to contractor from one point only on Railway's usual charge and the contractor should arrange for extra pipe as may be required for distribution at his cost. Water used for cement concrete/RCC/PSC and all sorts of concrete work should be tested as per codal Provision for its suitability for the work and test report should be obtained initially from the approved Govt. laboratory at Contractor' s cost and submitted DY.CE/ Con or DEN/Con-in-charge of the work. Source of water should not be changed without prior approval of the DY.CE/Con-in-charge. Locally available water, which is not suitable for concrete work, may be allowed to be used for curing purpose only.
4. **ELECTRICITY:** The contractor shall make his own arrangement for electricity required for running machinery and illumination at his own cost. The Railway will recommend his application to the Civil Electricity Board/Company and render necessary assistance as possible. If the contractor is unable to get the supply from the Board/Company and Railway is required to supply, then supply, if available, will be provided at one Point from there the contractor will lay the distribution system to various points of work. Such supply made by the Railway will be as per standard terms and conditions applicable to outsiders as stipulated by the Chief Electrical Engineer, E. Rly. The railway undertakes no responsibility for shut down, load shading or failure of power supply and consequent help-up of work, idle labour, machinery etc. and no compensation, payment is admissible. The charges on account of electricity supplied, will be recovered from the contractors bills, but he will have to deposit in advance the installation charges etc. as will be fixed by the Electrical Department.
5. **CORRDINATION WITH OTHER CONTRACTORS :** The other works for bridge may be done simultaneously by the other agency of State Govt./Central Govt./Railway .Therefore the contractor should ensure that the works of the other contracts are not hampered in any way, rather he should co-ordinate/draw the programs in consultation with the Engineer-in-charge of the work, so that the work of this contract as a whole is completed within the target fixed. In case of any conflict between the two contractors in respect of working facilities at site, the decision of the Engineer-in charge of the work shall be final and binding on both the contractors.
6. **DAMAGE TO ADJACENT PROPERTIES/WORKS:** The contractor shall be held responsible for any damage of Railway/Public property including telephone line, cable etc., which may be caused by any of his action in connection with or in the execution of the work.
7. **SETTING OF THE WORK :** The contractor shall arrange without any additional charges requisite number of men with all the equipments and materials as necessary for the purpose of setting out of the work. Similar arrangement will have to be made by him at the time of measuring the work whenever required to be carried out by the Engineer-in-charge of the work.
8. **LOCATION AND LEVEL :** The contractor shall be responsible for the correct location, level and alignment according to the approved drawing notwithstanding that the Engineer-in-charge or his authorized representative shall have periodically checked the same.
9. **SUSPENSION OF WORK :** Engineer-in-charge may order the contractor to suspend any work for any reason whatsoever and no compensation for such suspension of work shall be payable to the contractor, However, the additional time of completion of the work that may be sanctioned by the Railway Administration on written application of the contractor to complete such suspension of work.



10. **NIGHT WORK** : The contractor shall have to carry on with the work during night if considered essential to maintain the progress of the work and his quoted rates should be inclusive of any additional expenditure involved in the working at night.
11. The contractor must provide all plants and machinery with crew i.e. Drivers, cleaners and necessary consumable store like coal, fuel, oil, lubricating oils for Engine and provide adequate number of transport vehicle for bringing materials at site. They should undertake all temporary arrangement required for carrying out the work. The tenderer should submit a list of tools and plant in their possession for carrying out the work along with his offer.
12. Shoring on all sides of foundation trench will have to be adopted where necessary and as will be directed by the Engineers to return earth, at Contractor's cost.
13. **The work involved in head and/or truck leading of materials and crossing of tracks will not be paid extra. The rate quoted should cover all such expenditure.**
14. **UNFORSEEN / NEW ITEM of Work** : For unforeseen item of work for construction if required to be done, payment will be made by E.C.Rly's Schedule of Rate 2008 with percentage above and below quoted by tenderer in schedule "B". If any items are not covered by the Schedule of Rate 2008, the rate for such work will be arrived at by analysis based on labour and materials rate provide in the schedule of rate 2008. If no such analysis is possible from Schedule of Rates, the analysis will be made from prevailing market rates with 12 ½% contractors' overhead and profit.
15. The contractor shall provide all appliances, efficient and sufficient staff & labour for setting out and shall set out the works and every part thereof and shall be responsible for the accuracy of the lines, Levels and dimensions of the work in accordance with the drawings, further drawings, directives or instructions issued at any time to him and every facility shall be given to the Engineer and all persons, duly deputed or authorized by him in writing for checking the same. The Contractor shall also allow or amend any error in the dimensions, lines or levels to the satisfaction of the Engineer or his authorized representative without claiming any compensation for the same.
16. The contractor shall make his own arrangement on his own sole account for procuring all materials (except than those to be supplied by the Railway as per clause..... of the instructions to Tenderers) to be used on works under this Agreement with the Railway Administration. The rates quoted by him, against the Schedule of items, should be entirely inclusive so as to cover any purchase price and/or royalties and/or compensation for surface damage paid or payable by the contractor to land owners Mining authority etc. and all other charges incurred by him whatsoever including all lead, lift etc.
17. If the contractor enters on land not belonging to or held by the Railway Administration for collection or quarrying of materials or any other purpose whatsoever he shall make his own arrangements with the owner or owners of such land, with regard to, and shall be solely/personally liable for the payment of any purchase price and/or royalties and/or compensation for surface damage, and the Rly. Administration shall in no circumstance be purport to be made party to any such arrangements and be liable for any such payment and/or compensation.
18. The contractor will not be entitled to any compensation for any delay for execution of the work arising from delay from the Railway Administration side. The delay so caused will be assessed and accepted by the Engineer determining any extension of the time required to complete the work for which purpose only accepted period of delay will be taken into consideration. If the matter is not brought to the notice of the Engineer immediately such delays occur, no consideration for extension of time will be made later on. The contractor must accept as final and binding the decision of the Engineer-in-charge of the work.
19. **QUALITY CONTROL** :
 - 19.1 To ensure that the materials used for the work are as per the approved specifications, it is necessary for the contractor to have a small field laboratory with complete equipments at the site of work which will enable carrying out of standard tests for the quality of water, sand and aggregate etc. The rates should also provide for equipment for casting, Curing and testing of sufficient number of 6" cubes for compressive tests. Testing of the cubes should be got done through Alipore National Test House or any other approved Government Testing Laboratory as and when necessary, Periodical testing of water may also be got done through Alipore Test House or any other approved Government.
 - 19.2 The Concrete work shall be done in accordance with Indian Railway Standard code of Practice for plain reinforce and pre-stressed concrete for general bridge construction (Concrete Bridge Code) or IS-456-2000 or relevant IRC codes as applicable.

19.3 All concrete items will be measured without any reduction for the volume of reinforcement as and steel structural.

19.4 Concrete will be as per IS code (IS-456-2000). All concrete should be vibrated except for concrete placed in water for the bottom plug. Strength specified for various concrete in Schedule of Items is for 28 days strength of the well foundation.

19.5 The mix of all controlled concrete to be used shall be designed suitably as per IS-10262-1982 to meet requirements or strength and economy. Number of cubes may be made by trial mixes and tested to achieve the desired strength of the concrete.

20. **AGGREGATE AND SAND :** Periodical sieve analysis of the aggregate and sand will be carried out as necessary to ensure that the percentage of different sizes of aggregate and sand do not vary from the worked out during designing the concrete Mix
21. **WORK TESTS AND STANDARD OF ACCEPTANCE:** Number of cubes to be taken and tested should be in accordance with the provisions made in IS code 456-2000 and the results should satisfy the minimum requirements given therein.
22. The work under Rly. Traffic or by temporarily or by blocking Rly. Traffic, should be carried out under the supervision of Engineers/Supervisors of the contractor who have adequate experience of carrying out such works.
23. The contractor should carry out the work in such a way that would ensure safety to Railway Traffic and Railway properties. The works whose execution is having safety implication, should be carried out only under the direct supervision of competent Bridge Supervisors from Railway.
24. **TRAFFIC BLOCK REQUIRED:** The contractor should specify the requirement of temporary block required for the work. Temporary blocks will be arranged by the Engineer-in-charge of the work. Temporary blocks will be arranged by the Engineer-in charge of the work for the minimum period as suits the operating Department of the Railway.
25. The contractor shall keep sufficient stand-by equipment like mixer vibrator etc. for concrete work so that concreting is not affected by break down of tools and plants.
26. On C.C. or R.C.C. work, no cement plaster shall be permitted. The shuttering with cement/line plaster finish may be adopted for roof slabs, lintels etc.
27. Where the concrete is cast on ground i.e. in foundation, bottom slab of R.C.C. Box etc. a water proof film of polythene shall be spread on the ground after ground is leveled and compacted, to prevent soaking of moisture/water of the concrete into the ground.
28. All the materials like aggregate, sand and bricks shall be as per specifications laid down is GCC Before use, all materials shall be approved by the Engineer-at-site, Before use, they shall be cleaned of all mud, muck, grit etc. and shall be washed with clean water, if directed by Engineer, before use.
29. The payment of the following items of R.C.C. will be made under relevant items of ECR Schedule of Rates, 2008, as detailed below.
30. **ADMIXTURE:** Admixture confirmed as per RDSO guidelines (Report No. BS-25) may be used in concrete with Engineer's prior approval, if required.
31. For excavation in foundation, contractor shall ensure stability and safety of foundations as detailed in chapter 1 of East Central Railway Standard Specifications for Works and materials-2008.
32. Weep holes shall be kept in wing wall and abutment of bridges by placing thick gauge 50 mm Dia PVC pipe in the concrete before casting spaced 1.0 m vertically & horizontally staggered. No deduction in volume of contract will be made.

Witness

1.

Signature of Tenderer

2.

Date _____

East Central Railway
Office of the Chief Administrative Officer (Con)
Mahendru ghat, Patna- 800004

Special condition and specification of contract for foundation and substructure.

1. **SITE CLEARANCE:**

Site clearance wherever involved shall be undertaken and the same shall be considered incidental to the earthwork items and the contract unit rates for the same shall be deemed to be including of clearing and grubbing operation.

2. **EXCAVATION FOR STRUCTURES**

2.1 Pits and trenches for foundations for bridges, culvert walls 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 bottoms of all excavations shall be carefully leveled and stepped or benched as directed by the Engineer. Any pocket of soft or loose materials and fissures in the bottom of pits and trenches shall be removed and the cavities so formed filled or grouted with concrete 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 pit or trench and no excavation shall be filled in and covered with concrete until it has been so inspected and until the contractor has been authorized to proceed with the work. All surplus excavated materials from such excavations not required for refilling shall be deposited in embankments, or otherwise disposed off as directed. The work shall include all necessary sheeting, shoring, bracing, draining and pumping, the removal of all logs, stumps, stubs and other deleterious matter, obstructions necessary for placing the foundations.

When required by the Engineer, material in the last 300 mm of depth of the excavations shall not be removed until immediately before the concrete is to be placed.

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 backfilled with concrete of the foundation grade at the cost of the contractor.

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, constructing diversion channel, drainage channels, bunds and other necessary works to keep the foundation trenches dry when so 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 works.

Refilling of foundation pits and trenches shall be carried out only after the foundation and structural works within the excavations 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 soil layers not exceeding 250 mm loose thickness, which shall be watered and compacted to a dry density not less than that of the adjoining soil strata. Timber sheeting and other excavation supports shall be carefully removed as filling proceeds but the removal of such supports will not relieve the contractor of his responsibility for the stability of the works.

MEASUREMENT FOR PAYMENT:

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

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

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

2.7 **RATES :**

The Contract unit rate for the items of earthwork in excavation for structures shall be paid in full for carrying out the following operations:

- (i) Setting out including all ancillary work like pegging and supply of pegs etc.
- (ii) Construction of necessary sheeting, shoring and bracing and their subsequent removal.
- (iii) Removal of all logs, stumps, grubs and other deleterious matter.
- (iv) Back filling upto the top of foundation, clearing up the Site and disposal of all surplus material within leads up to 200 meters inclusive of all lifts and descents etc.

- (v) All labour, materials, tools, construction plants, safeguards and incidentals necessary to complete the work upto the specifications

3.0 **MATERIALS FOR STRUCTURES:**

All materials to be used in the works shall be in conformity with the requirements laid down as below: -
If any special material, 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.

3.1 **BINDING WIRE:**

Binding wires used for binding the reinforcements shall be of approved soft annealed G.I. wire not less than 1mm (18 SWG) size and conforming to IS 280.

3.2 **STRUCTURAL AND REINFORCEMENT STEEL:**

3.2.1 **Structural steel:** All structural steel shall conform to IS:2062:2006 for MS/HTS steel.

3.3.2 The reinforcement steel shall be Fe-500 Thermo Mechanical Treated (TMT) bars conforming to IS 1786.

3.3 **TIMBER:**

The timber used for structural steel purposes whether permanent / semi permanent or temporary work shall conform to IS: 883.

3.4 **WATER FOR CONCRETE AND MORTAR:**

Water shall be clean and free from injurious amount of deleterious materials. Normally potable water from an approved source may be considered satisfactory for washing aggregates, mixing and curing concrete. Water shall comply with specifications as stated in IS: 456.

3.5 **OTHER MATERIALS:** 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 49 of Special Conditions of Contract. 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 expense by the contractor.

3.6 **AGGREGATES FOR CONCRETE:**

3.6.1 General – The aggregates (coarse and fine) for concrete shall comply in all respects with IS: 383 and shall be obtained from an approved source.

Aggregates, 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 3.4. If the Engineer so directs, the contractor shall provide and operate a washing plant to ensure adequate supply of clean aggregates within the approved grading limits. All such washed aggregates shall be stored and drained for at least 24 hours before being used for concreting.

The coarse aggregates, unless otherwise specified or authorized by the Engineer shall be delivered to the site and shall consist of approved stone free from flaky or elongated pieces.

All aggregates shall be protected from dust contamination by methods approved by and to the satisfaction of the Engineer's representative.

3.6.2 The fine and coarse aggregates shall be measured separately by weight and mixed in the proportions specified or permitted for the various qualities of concrete except where volume batching is permitted by the Engineer. The individual and combined grading shall be as per relevant IS Codes and to the satisfaction of Engineer.

3.7 **SAMPLES AND TESTS:**

3.7.1 **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 indicating that all these materials conform to the various provisions laid down in the relevant IS codes other relevant standard specification these specifications and shall be submitted to the Engineer on request free of charge.

3.7.2 **TEST CERTIFICATES:**

All manufactures certificates of tests, proof sheets, mill sheets etc. showing that the materials have been tested in accordance with requirements of the appropriate Indian Standard other relevant standard specification these specifications, shall be supplied free of charge on request to the Engineer or his representative.

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

- (i) Stone
- (ii) Aggregates
- (iii) Bituminous materials.
- (iv) Any other materials as directed by Engineer.

Samples provided to the Engineer or his representative for their retention is to be in labeled boxes suitable for storage. Materials or 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 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 accepted as a reason for delay in completion of the work.

- 3.7.2.2 The testing of the materials may be carried out by the Railway in its own laboratory if facilities for such tests exist.

If the materials are not found to comply with the various provisions laid down in the relevant I.S. Codes other relevant standard specifications these specifications, the same shall be rejected irrespective of the test certificate submitted by the Contractor in compliance with Clause 3.7.1 and 3.7.2.

- 3.7.2.3 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 stockpiles on the site or any other locations to be indicated by the Engineer or his representative. The samples are to be drawn in accordance with IS: 2386 and tested in a laboratory approved by the Engineer in accordance with the appropriate Clause of IS 2386 at the cost of the contractor.

- 3.7.2.4 Tests for the determination of impurities in the sand shall be made once daily until the Engineer is satisfied that the specified compressive strength is being regularly obtained when with his approval, such tests shall be made once weekly and at other times as directed to the Engineer.

3.7.3 **ADDITIONAL TESTS:**

In addition to the tests required under Clauses 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 Clauses of IS 2386 and cost of such tests shall be borne by the Contractor.

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

3.7.3.2 **INSPECTION OF MATERIALS:**

- 3.7.3.3 Whenever 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 notice of such materials being ready for inspection, test or examination.
- 3.7.3.4 Delay to works arising from the late submission of such notice will not be acceptable as a reason for delay in the completion of the works.

3.7.5. **REJECTION OF MATERIALS:**

- 3.7.5.1 Materials shall be tested before leaving the manufacturer's premises, where appropriate. Materials may also be tested on the site and they may be rejected if found not suitable or not in accordance with the specifications notwithstanding the result of tests at the manufacture's works or elsewhere or test certificates.
- 3.7.5.2 The Engineer or his representative shall have the right to order, at any time, any aggregates or other construction materials, which do not meet with his approval, shall not be used in the works. 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.
- 3.7.5.3 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 get these removed by other means at the cost of the contractor.

3.7.6 **STORAGE OF MATERIALS:**

- 3.7.6.1 All materials to be used in permanent works shall be stored on racks, 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.
- 3.7.6.2 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 be sufficient to ensure continuity of work. Each type of grading of aggregates shall be stored in separate stacks 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.

3.8 **PLAIN AND REINFORCED CEMENT CONCRETE:**

3.8.1.1 **GRADE OF CONCRETE:**

For all items of concrete in any part of the bridge structure Design mix concrete shall be used. However, nominal mix concrete may also be used where it is shown on the drawings or as directed by the Engineer, for concrete of grade M 20 and below only.

3.8.2 **TYPE OF CEMENT:**

In general for all mass and reinforced concrete PPC/PSC cement conforming to IS 12269/IS 1489/IS 455 shall be used. However, Railway 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 without any additional claims whatsoever on this account.

In case of Pre-stressed concrete works only OPC is to be used.

3.8.3 **STRENGTH REQUIREMENT OF CONCRETE:**

3.8.3.1 For concrete work where mix design concrete is to be used, mix shall be designed. Mix design shall be done as per I.S. code or any other approved method for concrete mix design as directed by the Engineer. Mix design will be done by the contractor and got approved from the Engineer.

3.8.3.2 For ordinary concrete, mix is not required to be designed by preliminary tests and proportions of cement; fine and coarse aggregates are specified by volumes.

3.8.3.3 In designation of concrete mix letter 'M' refers to the mix and number to the specified 28 days characteristic compressive strength of that mix on 150 mm cubes expressed in N/mm^2 .

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

GRADE OF CONCRETE	SPECIFIED CHARACTERISTIC COMPRESSIVE STRENGTH OF 150 MM CUBE AT 28 DAYS IN N/mm^2
M15	15
M20	20
M25	25
M30	30
M35	35

3.8.3.5 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 purposes as concrete belonging to the lower of the two grades between which its strength lies.

3.9 **SETTING UP OF FIELD LABORATORY BY THE CONTRACTOR :**

The contractor shall set up a field laboratory of his own at work site as per site requirement which should be open for use and inspection by the Railway at any time All the pressure gauges and other machines, equipments and measuring instruments of the laboratory shall be got checked and calibrated regularly as directed by the Engineer by an independent agency and the adjustment certificates shall be 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 born by the Contractor. The cost of all tests for materials and cubes shall be borne by the Contractor.

3.10 **TESTS AND STANDARD OF ACCEPTANCE:-**

3.10.1 **PRELIMINARY TEST FOR DESIGN MIX CONCRETE:**

3.10.1.1 Design of the mix shall be carried out by the Contractor in his own laboratory in presence of the Engineer's representative.

3.10.1.2 Trial mixes shall be made using samples of the aggregate and cement and water proposed be used in the works.

3.10.1.3 Should the strength shown by the preliminary tests prove to be below the figures specified in Para 3.8.3.4 the Contractor shall make such changes in proportions as are required to bring the concrete up to the required strength.

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

3.10.1.4 For Design Mix concrete, the concrete mix shall be so designed as to attain specified characteristic compressive strength of 150 mm cube at 28 days as indicated in IS 456.

3.10.2 **WORKS STRENGTH TESTS FOR DESIGN MIX AND ORDINARY CONCRETE:**

3.10.2.1 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.

3.10.2.2 Works strength tests shall be made in accordance with IS: 516. Each test shall be conducted on ten specimens, five of which shall be tested at seven days and the remaining five at 28 days. The samples of concrete shall be taken on each day of concreting and cubes shall be made at the rate of one for every 5 cubic meters of concrete or a part thereof. However, if concreting done in a day is less than 15 cubic meters, the minimum number of cubes can be reduced to 6 with the specific permission of the Engineer or his representative. Similar work tests shall be carried out whenever the quality and grading of materials is changed irrespective of the quantity of concrete, poured. Cement used for making the test cubes shall be supplied by Contractor within his quoted rates.

3.10.2.3 The Contractor shall provide at his own expense all necessary labour, materials including concrete moulds, equipments for sampling and all other ancillaries required in preparing, specimens etc. as given in Clause 3.10.2.2 and arrange to carry and test these specimens in his owns field laboratory. The Contractor shall test these specimens in presence of the representative of Engineer. Duplicate

results shall be maintained under the joint signature of the Contactor and the Engineer's representative, one set of the result being kept with the Contractor and the other with the Engineer's representative.

3.10.2.4 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.

3.10.2.5 The Engineer reserves the right to take samples and 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 cubes such as labour, material including concrete moulds, equipment for sampling and all other ancillaries required in their preparation. The contractor shall also arrange to transport these specimens to the Railway's laboratory / Govt. approved laboratories at his own cost. Contractor shall depute his representative during testing who shall sign the test results as a token of contractor's acceptance.

3.10.3 **STANDARD OF ACCEPTANCE**

The acceptance criteria for concrete shall be as indicated in IS 456.

3.11 **PROPORTIONING CONCRETE :**

For high quantity of concrete Design mix shall be followed and for small quantity of concrete ordinary nominal mix may be followed.

3.11.1 **DESIGN MIX CONCRETE:**

3.11.1.1 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. Grading of aggregate shall be controlled by obtaining the coarse aggregates in different sizes and blending them in right proportions as required. Grading of coarse and fine aggregate shall be checked as frequently as possible and as determined by the Engineer.

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

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

3.11.1.4 To maintain the specified water cement ratio constant and at its correct value, moisture content 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.

3.11.2 **ORDINARY CONCRETE:**

3.11.2.1 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 shall be made as per IS: 2386 (Part-III).

3.11.2.2 Ingredients required for ordinary concrete containing one 50 Kg. bag of cement for different grade of concrete is given below: -

Grade of Concrete	Mix by volume
M 10	1:3:6
M 15	1:2:4
M 20	1:1½:3

3.11.3 **QUANTITY OF WATER:-**

3.11.3.1 Optimum quantity of water shall be mixed just to produce a dense concrete of required workability. Workability shall be such that the concrete surrounds and properly grips all reinforcements. The degree of consistency, which shall depend upon nature of work and method of vibration of concrete shall be determined by regular slump tests, Usually for mass concrete in R.C.C. foundation works where vibrators are used the slump shall be within 10mm to 25 mm.

3.11.3.2 The workability of concrete both ordinary and Design Mix of different grades used in different components shall be determined by regular slump tests to be carried out by the Contractor at his own cost, 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 the slump tests independently at his own discretion.

3.11.4 **MIXING CONCRETE:-**

3.11.4.1 All concrete shall be mixed at site in a Batching Plant drum type mechanical mixer of first class working condition to the satisfaction of Engineer-in-charge. Mixing shall be continued till materials are uniformly distributed and a uniform color 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.

- 3.11.4.2 Mixers, which have 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 stand by mixing plant, equivalent to that in use, shall be provided and maintained ready for immediate use during any breakdown.
- 3.11.5 **USE OF ADMIXTURES:**
The admixture to be used in the concreting work should conform to IS: 9103. The admixtures to be used should be of approved quality and it should not adversely affect the properties of concrete or mortar particularly in respect of strength, volume- change, durability and it should have no deleterious effect on reinforcements. Admixtures containing Calcium chloride shall not be used in structured concrete containing reinforcement, pre-stressing tenders or other embedded metal. The admixtures containing Cl & SO₃ ions shall not be used. Admixtures containing nitrates shall also not be used. Admixtures based on thiocyanate may promote corrosion and therefore shall be prohibited.
- 3.11.6 **FORM WORK:**
- 3.11.6.1 The term form work includes all temporary or permanent forms essential for forming the concrete, together with all temporary construction props, bracings, ties required for the support. In general the erection and removal of formwork shall be in accordance with the provision given under IRS Concrete Bridge code.
- 3.11.6.2 **CONSTRUCTION AND PREPARATION OF FORM WORK BEFORE CONCRETING:**
Forms for concrete shall be made of either metal or timber; suitably ply lined and is of substantial and rigid construction true to shape, alignment and dimensions as shown on the approved drawings. 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 the weight 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 formwork does not hinder the shrinkage of concrete because without these cracking could occur before the formwork is removed. The formwork should take due account of the calculated amount of positive or negative camber so as to ensure the correct final shape of the structures. When the forms are ready for commencing concreting, the contractor shall inform the Engineer or his representative to inspect and accept the form-work and forms as to their strength, alignment and general fitness. Being satisfied with the form work Engineer then may allow the contractor for pouring concrete but such inspection and permission shall not relieve the contractor of his responsibility for safety of man, machinery, materials and for results obtained.
- 3.11.6.3 **REMOVAL OF FORM WORK:**
The consent of Engineer or his representative shall be obtained in all cases before removing any formwork 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. 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. 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 formwork. 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. The form works shall be cleaned and made good to the satisfaction of the Engineer before re-use. 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.
- 3.11.7 **TRANSPORT, PLACING AND COMPACTION OF CONCRETE:**
- 3.11.7.1 The concrete work will be done by mixing cement, sand and coarse aggregate in the computer controlled automatic batching plant, transported to the site in transit mixtures and concrete placed in position by concrete pumps. Batching plant, transit mixtures and concrete pump should be of adequate capacity so that requirement of placement of concrete without construction joint can be met in a period of 10 to 12 hours. All concrete shall be so transported and placed that no contamination, segregation or loss of its constituent materials takes place.
- 3.11.7.2 All form work and reinforcement, contained in it shall be cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete. No concrete shall be placed in any part of the structure until the approval of Engineer or his representative has been obtained. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer. Concrete when deposited shall have a temperature of not less than 4.5°C and not more than 38°C. In extreme weather conditions, provisions of IS 456 should be followed:

- 3.11.7.3 Except where otherwise agreed to by the Engineer or his representative concrete shall be deposited in horizontal layers to a compacted thickness of not more than 450mm when internal vibrators are used and not exceeding 300mm in all other cases. In no case concrete shall be allowed to be dropped from a height of more than 2 meters.
- 3.11.7.4 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 any segregation of its ingredients. The delivery end of chutes 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 formwork.
- 3.11.7.5 All concrete shall be compacted to produce a dense homogeneous mass with help of vibrators except in case of concrete poured under water, where vibrators cannot be used. To ensure thorough and properly compacted concrete, the contractor shall carry out necessary compacting factor tests at his own cost at such frequency and at 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 consistometer 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 discretion. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns. Internal vibrators shall be capable of producing not less than 10,000 cycles per minute and external or form vibrators not less than 3,000 cycles per minute. Vibration shall not be applied through reinforcement and where vibrators of the immersion type are used, contact with reinforcement and all inserts shall be avoided, as far as practicable.
- 3.11.8 **CONCRETING UNDER WATER:**
- 3.11.8.1 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. 10 percent extra cement shall be added per mix of concrete over that required by the grade specified. Greatest care shall be taken to prevent the cement being washed out and the concrete shall be deposited by means of a tremie or using the skip boxes system. Pumping shall always be kept as nearly level as possible to prevent formation of seams.
- 3.11.8.2 The deposition of concrete should run 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 seams.
- 3.11.9 **FINISHING:**
- 3.11.9.1.1.1 Immediately after the removal of forms, all exposed bars or bolts passing through R.C.C. member and used for shuttering or any other purpose shall be cut inside the R.C.C. member to a depth of at least 25 mm below the surface of the concrete and the resulting holes be closed by cement mortar.
- 3.11.9.1.1.2 All construction and expansion joints in the completed works 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.
- 3.11.9.1.1.3 If in the opinion of the of the Engineer, the pockets/honeycomb in the structure are found to such an extent or character as to affect the strength of the structure materially or endanger the life to reinforcement he may declare such concrete defective and order for its removal and replacement at the expense of the Contractor.
- 3.11.10 **CURING:**
- All concrete shall be protected immediately after compaction and during hardening from harmful effects of rain, running water, sunshine, frost, driving winds, shocks, vibration, 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.
- 3.11.11 **CONSTRUCTION JOINTS:**
- 3.11.11.1.1 All construction joints whether, 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.
- 3.11.11.2 At construction joints where the concrete has set 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 a 13 mm thick layer of cement mortar of same proportion as in concrete and 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, vibrations, etc and the damping effect on vibration in such position shall be allowed for.
- 3.11.11.3 Construction joints shall be avoided as far as practicable in case of structures, especially 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 positions of construction joints shall be predetermined and got approved by the Engineer.

3.11.12 MEASUREMENT FOR PAYMENT

The work of cement concrete shall be measured in cubic meters. The volume occupied by reinforcement shall not be deducted in reinforced concrete.

3.11.13 RATE FOR CONCRETE WORK

The unit rate for concrete work shall be quoted to include the cost of all materials including admixtures, if any (if the situation so warrants the contractor shall use the plasticizer for which nothing extra will be paid), except cement and reinforcement steel, which will be paid separately under Sch.-‘C’, labour, tools and construction plants required for proper mixing, transporting, placing in position, vibrating and compacting, finishing, curing and cost of all form work including erection and removal and all other incidental expenses for producing concrete of required strength to complete the structure or its components as per approved drawings and according to these specifications complete in all respects to the satisfaction of the Engineer.

3.12 REINFORCEMENT:

3.12.1 All reinforcements 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.

3.12.2.1.1 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.

3.12.2.2 WELDING:-

As per relevant IRS Specification.

3.12.3 PLACING AND MAINTENANCE OF REINFORCEMENT IN POSITION:

3.12.3.1 All reinforcement bars shall be cut and standard hooks 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 3.1) and by using dense concreting 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 will not be allowed to sag between supports nor 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.

3.12.3.2 As far as possible, bars of full length shall be used. When bars are required or permitted to be lapped by the Engineer or his representative, the overlaps 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 or IS Code provisions.

3.12.4 MEASUREMENT FOR PAYMENT

Reinforcement shall be measured in length (running meter) separately for different diameters as actually used in the work including overlaps, hooks at ends and excluding of chairs, supports as actually placed and incorporated in the work from the length so measured the weight of the reinforcements shall be calculated based on the standard unit weight.

3.12.5 RATE FOR RE-INFORCEMENT WORK:

3.12.5.1.1 The unit rate for reinforcement work shall be quoted so as to include its transportation and storing at Contractor’s worksite, bending, fixing and binding in position by Contractor’s own labour and equipments as per approved drawings and as directed by the Engineer. It shall also include the cost of annealed binding wire as per Clause 3.1 and all other tools and equipments. Rate quoted by the tenderer should include provision for wastage in cutting, providing spacers, separators and hanger bars etc. and no extra payments shall be made towards the same.

10.0 AESTHETIC REQUIREMENT:

The contractor shall make every effort to ensure that all part of the Bridge sub- structure are of good appearance and aesthetically acceptable. The external surface finish shall be suited to these requirements and be in harmony with nature and depositing of the materials and surroundings.

Proper finishing to all chamfers and no sign, surface treatment to exposed surfaces, caulking of gaps and joints, etc. shall have to be done as per the requirements as specified elsewhere and to the satisfaction of the Engineer.

11.0 TEMPORARY STRUCTURE :

The contractor(s) will be required to submit any designs/drawings for approval of the Railway for such temporary structures, which are connected with the permanent work.

Witness

- 1.
- 2.

Signature of Tenderer

Dated: _____



East Central Railway
Office of the Chief Administrative Officer (Con)
Mahendru ghat, Patna- 800004

Special conditions and the specification for Reinforcement Steel

1.1 Steel

Steel used in the works shall be thermo mechanically treated (TMT) steel bars conforming to IS: 1786 (latest revision) usable in Earthquake Zone IV & V also. The steel shall be procured only from those firms, which are Established, Reliable, Indigenous & Primary Producers of Steel, having Integrated Steel Plants (ISP), using iron ore as the basic raw material and having in-house iron Rolling facilities, followed by production of liquid steel and crude steel, as per Ministry Of Steel's guidelines.

All reinforcement work shall be executed in conformity with the drawings supplied and instructions given by the Engineer and shall generally be carried out in accordance with the relevant Indian Standard Specifications (IS: 2502).

1.2 Inspection & Testing

Every bar shall be inspected before assembling on the works and any defective, brittle, excessively rusted or burnt bars shall be removed. Cracked ends of bars shall be cut out.

Physical Test	IS: 2062, IS: 432	(I)	Upto 10mm dia One sample per 25 MT or part thereof
		(II)	Above 10mm dia One sample per 40 MT or part thereof

1.3 Lapping & Welding

As far as possible, bars of the maximum length available shall be used. Laps shown on drawings or otherwise specified by the Engineer should be used. In case the Contractor wishes to use shorter bars, laps shall be provided at the Contractor's cost in the manner and at the locations approved by the Engineer. In any case laps provided in addition to laps shown on the bar bending schedule to be issued by Railway will not be measured for payment purpose.

ii) As and when necessary, welded laps shall be provided as specified by the Engineer.

1.4 Spacing, Supporting & Cleaning

- i) All reinforcements shall be placed and maintained in the positions shown on the drawings.
- ii) The Contractor shall provide approved types of supports as specified on the drawings for maintaining the top bars of the slab in position during concreting. All cover blocks shall be of concrete (not sand cement mortar) and of the same strength as that of the surrounding concrete and properly compacted and vibrated on a vibrating table.

They shall be cured for a minimum period of 21 days before they are used in the works.

- iii) 18 SWG. G.I. wire shall be used as binding wire. All frames crossing one another shall be bound with this wire twisted tight to make the skeleton on network rigid so that the reinforcement is not displaced during placing of concrete.
- iv) Bars must be cleaned before concreting commences of all scale, rust or partially set concrete which may have been deposited there during placing of a previous lift of concrete.

The bars shall be cleaned with dry gunny bags if they are coated lightly with rust or other impurities. On no account shall the bars be oiled or painted nor shall mould oil used on the formwork be allowed to come in contact with the bars. Cement wash to bars will not be permitted.

1.5 Welding

- i) Wherever specified, all welding shall be carried out in accordance with IS: 2571. Only qualified welders shall be permitted to carry out such welding.
- ii) For cold twisted reinforcement, welding operations must be controlled to prevent a supply of large amounts of heat larger than what can be dissipated. The extreme non-twisted end portion shall be cut off before welding. Electrodes with rutile coating should be used.
- iii) The welding procedure shall be approved by the Engineer and tests shall be made to prove the soundness of the welded connection.

1.6 Measurement of Payment

Reinforcement shall be measured in length for different diameters as actually used in the works including overlaps as shown in the bar bending schedule to be issued by Railway but excluding other overlaps if provided by the contractor in addition to the overlaps shown on the bar bending schedule of Railway and excluding overweight. From the length so measured, the weight of reinforcement shall be calculated in tones on the basis of standard weights as per IS: 1732. Lengths shall include hooks at ends and overlap as shown in the bar bending schedule to be issued by Railway. Wastage, additional overlaps, coupling, welded joints, spacer bars, chairs etc. and annealed G.I. wire (18 SWG) for binding shall not be measured and cost of these items shall be deemed to be included in the rates of RCC & PSC work.

The contract unit rate for RCC and PSC work shall include cost of bending, placing, binding, welding if required and fixing in position of reinforcement as shown on the drawings and as directed by the Engineer. It shall also include cost of all devices for keeping reinforcement in approved position, cost of jointing as per approved method and all wastage, overlaps and spacer bars.

Witness

- 1.
- 2.

Signature of Tenderer

Dated: _____



East Central Railway
Office of the Chief Administrative Officer (Con)
Mahendru ghat, Patna- 800004

Special conditions and Specifications for Structural Concrete

1.1 CEMENT:

- (i) Ordinary Portland Cement of 53 grade conforming to IS: 12269/ PPC as per IS1489/ PSC as per IS 455 as approvable shall be used for all permanent structures.
- (ii) C3A content of OPC should be between 5 to 8 percent.
- (iii) Cement of reputed brand viz. Gujarat Ambuja, L&T, ACC, Rajashree, Birla Super JP Cement is to be used. If contractor proposes to use cement of any other brand, the same shall be got approved by Railway duly submitting test certificate and manufacturer's specification.

1.2 FINE AGGREGATES (SAND):

- (i) Creek/ Marine sand shall not be used in permanent work.
- (ii) Sand, if found too coarse, shall be suitably blended with finer sand obtained from approved sources to obtain the desired grading. The provision of two types of sand, their stacking separately and their mixing in the specified proportions shall be at the contractor's cost. The sand shall not contain silt, shale, clay and other weak particles more than a total of 3% by weight.
- (iii) The grading of the sand shall conform to IS: 2386. The sand shall be screened on a 4.75mm size screen to eliminate over size particles. The sand shall conform to IS:383. The sand shall be washed in screw type mechanical washers in potable water to remove excess silt, clay and chlorides. The screening and washing of sand shall be completed at least one day before using it in concrete. The washed sand shall be stored on a sloping platform and in such a manner as to avoid contamination

1.3 COARSE AGGREGATES:

- (i) Coarse aggregates for the works shall be crushed stone conforming to IS: 383, obtained from approved sources. Only quarries having jaw crushers with choke feeding arrangements producing aggregates of nearly cubical shape shall be approved.
- (ii) Coarse aggregate containing flat or flaky pieces or mica shall be rejected.
- (iii) The aggregates shall be subjected to tests in accordance with IS: 2386 as may be ordered by the Engineer.
- (iv) Aggregate shall be stored in such a way as to prevent segregation of sizes and avoid contamination with fines and other undesirable material.
- (v) Specific gravity of C.A should be more than 2.65.

1.4 WATER:

- (i) Potable water from supply of proper quality should be used.
- (ii) The permissible limits for solids shall be as follows:

	Permissible limits (Max.)
Organic	200 mg/ lit
Inorganic	3000 mg/ lit
Sulphates (SO ₄)	500 mg/ lit
Chlorides (Cl)	300 mg/ lit
Suspended matter	2000 mg/ lit
Alkalis	10 mg/ lit
Acidic material	2 mg/ lit

- (iii) The pH value shall not be less than 6.

1.5 CONCRETE ADMIXTURES:

1.5.1 GENERAL:

Concrete admixtures are proprietary items of manufacture and shall be obtained only from established manufactures with proven track record, quality assurance and full ledged laboratory facilities for the manufacture and testing of concrete. Naphthalene or melamine based admixtures as approved by Railway only shall be used in the work. The admixture shall be non-air entraining type. The contractor shall provide the following information concerning each admixture after obtaining the same from the manufacturer:

- a) Normal dosage and detrimental effects, if any, of under dosage and over dosage.

- b) The chemical names of the main ingredients in the admixtures.
- c) The chloride content, if any, expressed as a percentage by the weight of the admixture.
- d) Values of dry material content, ash content and relative density of the admixture which can be used for Uniformity Tests.
- e) Whether or not the admixture leads to the entrainment of air when used as per the manufacturer's recommended dosage, and if so to what extent.
- f) Where two or more admixtures are proposed to be used in any one mix, confirmation as to their compatibility.
- g) There would be no increase in risk of corrosion of the reinforcement or other embodiments as a result of using the admixture.
- h) Retardation achieved in initial setting time.

1.5.2 PHYSICAL AND CHEMICAL REQUIREMENTS:

Admixtures shall conform to the requirements of IS: 9103. In addition, the following conditions shall be satisfied.

- a) "Plasticizers" and "Super- Plasticizers" shall meet the requirements indicated for "Water reducing Admixture".
- b) The air content of freshly mixed concrete in accordance with the pressure method given in IS: 1199 shall not be more than 1 percent higher than that of the corresponding control mix.
- c) There shall be no chloride content in admixture when tested in accordance with IS: 6925.
- d) Uniformity tests on the admixtures are essential to compare qualitatively the composition of different samples taken from batch to batch or from the same batch at different times.
- e) All tests relating to the concretes admixtures shall be conducted periodically at an independent laboratory and compared with the data given by the manufacturer.
- f) While Qualifying the admixture the infra-red spectrograph plot should be given. Each batch of the supply should be tested for I.R. Spectrograph and prove the consistency of supply.

1.6 Storage of Materials:

1.6.1 General:

All materials may be stored at 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 re storage of the materials. All such materials even though stored in approved Godown/ places, must be subjected to acceptance test prior to their immediate use.

1.6.2 Aggregates:

Aggregate stockpiles may be made on ground that is denuded of vegetation, is hard and well drained. If necessary, the ground shall be covered with 50 mm planks.

Coarse aggregates, unless otherwise agreed by the Engineer in writing, shall be delivered to the site in separate sizes (2 sizes when nominal size is 25mm or less and 3 sizes when the nominal size is 32mm or more).

Aggregates placed directly on the ground shall be removed from the stockpile above 30 cm of the ground until the final cleaning up of the work, and then only the clean aggregate will be permitted to be used.

In the case of fine aggregates, these shall be deposited at the mixing site not less than 8 hours before use and shall have been tested and approved by the Engineer.

1.6.3 Cement:

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 ground level in perfectly dry and water-tight 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 months. Cement older than 3 months from the date of manufacture shall not be used.

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 which had deteriorated in any way, during storage, shall not be used in the works and shall be removed from the site by the Contractor without charge to the Employer.

The Contractor shall prepare and maintain proper records on site in respect of delivery, handling, storage and use of cement and these records shall be available for inspection by the Engineer at all times.

The Contractor shall make a monthly return to the Engineer on the date corresponding to the interim certificate date, showing the quantities of cement received and issued during the month and in stock at the end of the month.

1.8.3 Requirements for Designed Mixes:**B.7 Trial Mixes: (For Strength)**

- i. The Contractor entirely responsible for the design of the concrete mixes. The design is however to be approved by the Engineer. At least 8 weeks before commencing any concreting in the works, the contractors shall make trial mixes using samples of coarse aggregates, sand, water super plasticizer and cement, typical of those to be used in the works, and which have been tested in an approved laboratory. A clean dry mixer shall be used and the first batch discarded.
- ii. The cement content for different grades of concrete and the required average strengths at 28 days for which the mixes shall be designed are specified below:

Table-1

Grades of concrete (mm)	Characteristic strength (f'ck) at 28 days	Target mean Strength f'cm Mpa 28 days	Min. cement content kg/m ³ for RCC	Min. cement content kg/m ³ for PSC	Water cement Ratio (Max.) for RCC	Water cement Ratio (Max.) for PSC	Maximum Slump at placing point
M20	20	29	300	400	0.5	0.4	150
M35	35	44	300	400	0.5	0.4	170
M45	45	54	300	400	0.5	0.4	100

N.S.: Use of approved super plasticizer for Plain Cement Concrete and Reinforced/precast-cast-in-situ cement concrete is mandatory at contractor's cost.

The mixes are designed to yield target mean strengths (f'cm) greater than the corresponding specified characteristics strengths (f'ck) as indicated in above Table. The difference between f'cm and f'ck is called the "Current Margin". The value of the current margin has been set at 9 Mpa for all grades of concrete. The concrete mixes shall be designed on the basis of required strength, desired workability, the maximum size of aggregate and also the various grades of cement as specified in IS: 10262-1982, Clause 3.1.1 Accordingly the required cement content shall be ascertained. The contractor may be allowed to use either approved Super plasticizers or increased cement content to achieve the required strengths at his own cost.

- iii. For each grade a total of 18 cubes shall be made. Of these 18 cubes made, no more than 6 may be made on any day and further, of the 6 cubes made in one day not more than 2 cubes may be made from any single batch. 9 of these cubes, each representing a different batch of concrete shall be tested at the age of 7 days and the remaining 9 cubes shall be tested the age of 28 days. The making of cubes, their curing, storing, transporting and testing shall be in accordance with Indian Standards IS: 516. The test shall be carried out in a laboratory approved by the Engineer.
- iv. If the average strength of the concrete cubes falls below the required target mean strength (f'cm) fresh preliminary mixes for that grade shall be made as before, until the trial mixes yield cubes of compressive strength at 28 days greater than the required average target mean strength (f'cm) at that age.
- v. Whenever there is a significant change in the quality of any of the ingredients for concrete, the Engineer may at his discretion order the carrying out of fresh trial mixes. All costs for trial mixes and tests shall be to the Contractor's account and held to be included in the contract rates.
- vi. Before commencing the works the Contractors shall submit to the Engineer for approval full details of the preliminary trial mixes and tests.

1.8.4. The Contractor shall carry out trial casting of a mock-up of half of girder length to establish the correctness of grading aggregates, suitability of formwork, of admixtures proposed, suitability of mould oil proposed to be used on formwork, to prevent surface blemishes etc.

1.8.5 When the proportions of a concrete mix have been approved by the Engineer, the contractor shall not vary the quality or source of the materials or the mix without the written approval of the Engineer.

1.8.6 After some test results if it is found that standard deviation of strength of cubes is uniform and is less than 5 mix design may be revised as per IS 456 & IS 10262.

1.8.7 Size of Coarse Aggregate:

The size (maximum nominal) of coarse aggregates for concrete to be used in various components shall be given as Table-3.

Table-3

Components	Max. Nominal Size of Coarse Aggregate
(i) Nominal mix	40/20
(ii) RCC solid type piers and abutments	40/ 20
(iii) All other RCC work	20

The proportions of the various individual size of aggregates shall be so adjusted that the grading procedures densest mix and the grading curve corresponds to the maximum nominal size adopted for the concrete mix.

1.8.8 Equipment:

Unless specified otherwise, equipment for production, transportation and compaction of concrete shall be as under:

- a) For Production of Fully automatic Concrete batching and mixing plant with minimum capacity of 25 cum per hour and total no. of batching and mixing plants should not be more than four nos.

All measuring devices of the equipment shall be maintained in a clean and serviceable condition. Its accuracy shall be checked over the range in use, when set up at each site and thereafter periodically as directed by the Engineer.

- b) For Concrete Transportation depending upon actual requirement
- i) Concrete dumpers
 - ii) Powered hoists minimum 2 ton capacity
 - iii) Chutes minimum 0.5 ton capacity
 - iv) Buckers handled by cranes
 - v) Transit truck mixer
 - vi) Concrete pump
 - vii) Concrete distributor booms
 - viii) Belt conveyor
 - ix) Cranes with skips
 - x) Tremies
 - xi) Air compressor
 - xii) Any other equipment to suit the working condition
- c) For Compaction of Concrete
- i) Internal vibrators Size 25mm to 70mm
 - ii) Form vibrators minimum 500 watts
 - iii) Screed vibrators full width of carriageway (up to two lanes)
- d) Adequate standby arrangement should be available for all equipment.

1.8.9 MIXING CONCRETE:

Concrete shall be mixed either in a concrete mixer or in a batching and mixing plant as per these specifications or as directed by Engineer in charge. Hand mixing shall not be permitted. The mixer or the plant shall be at an approved location considering the properties of the mixes and the transportation arrangements available with the Contractor. The mixer or the plant shall be approved by the Engineer.

Mixing shall be continued till materials are uniformly distributed and a uniform color of the entire mass is obtained, and each individual particle of the coarse aggregate shows complete coating of mortar containing its proportionate amount of cement, preferably for 2 minutes.

Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch. Unless otherwise agreed to by the Engineer, the first batch of concrete from the mixer shall contain only two thirds of the normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type of mix to another.

1.8.10 Transporting, Placing and Compaction of Concrete:

The method of transporting and placing concrete shall be approved by the Engineer. Concrete shall be transported and placed as near as practicable to its final position, so that no contamination, segregation or loss of its constituent materials takes place. Concrete shall not be freely dropped into place from a height exceeding 1.5 meters.

When concrete is conveyed by chute, the plant shall be of such size and design 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 any segregation of its ingredients. The delivery end of the 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 formwork.

All formwork and reinforcement contained in it shall be cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete.

No concrete shall be placed in any part of the structure until approval of the Engineer has been

obtained.

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 the construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed.

Except where otherwise agreed to by the Engineer, concrete shall be deposited in horizontal layers to a compacted depth of not more than 450mm.

Concrete when deposited shall have a temperature of not more than 40°C. It shall be compacted in its final position within 30 minutes of its discharge from the mixer, unless carried in properly designed agitators, operating continuously, when this time shall be within 1 hour of the addition of cement to the mix and within 30 minutes of its discharge from the agitator. It may be necessary above are unacceptable. In all such matters, the Engineer's decision shall be final.

Concrete shall be thoroughly compacted by vibration or other means during placing and worked around the reinforcement, tendons or duct formers, embedded fixtures and into corners of the formwork to produce a dense homogenous void-free mass having the required surface finish. When vibrators are used, vibration shall be done continuously during the placing of each batch of concrete until the expulsion of air has practically ceased and in a manner that does not promote segregation. Over vibration shall be avoided to minimize the risk of forming a weak surface layer. When external vibrators are used, the design of formwork and disposition of vibrator shall be such as to ensure efficient compaction and to avoid surface blemished. Vibrations shall not be applied through reinforcement and where vibrators of immersion type are used, contact with reinforcement and all inserts like ducts etc., shall be avoided. The internal vibrators shall be inserted in an orderly manner and the distance between insertions should be about one and half times the radius of the area visibly affected by vibration. Additional vibrators in serviceable condition shall be kept at site so that they can be used in the event of breakdowns.

Mechanical vibrators used shall comply with IS: 2505, IS: 2506, IS: 2514 and IS: 4656.

1.8.11 Construction Joints:

A PSC girder shall be cast in single pour of concrete without any cold joints or construction joints. Even for other bridge structures, construction joints shall be avoided as far as possible and in no case the locations of such joints shall be changed or increased from those shown on the drawings, except with express approval of the Engineer. The joints shall be provided in a direction perpendicular to the member axis. Sequencing of concrete placement should be organized in such a way that cold joints are totally eliminated. The sequence of concreting shall be submitted for approval of Railway prior to concreting of the structural element.

All construction joints, if approved shall be treated with epoxy compound after preparing the surface with V-notch, cleaning etc. complete to the satisfaction of the Engineer.

1.8.12 Concreting Under Water:

When it is necessary to deposit concrete under water, the methods, equipment, materials and proportions of mix to be used shall be got approved from the Engineer before any work is started. Concrete shall contain 10% more cement than that required for the same mix placed in the dry.

Coffer dams 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. Coffer dams in still water shall be sufficiently tight to prevent loss of mortar through the joints in the walls. Pumping of water shall not be done while concrete is being placed or until 24 hours thereafter. 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.

All under-water concreting shall be carried out by tremie method only, using tremie of appropriate diameter. The number and spacing of the tremie's should be worked out to ensure proper concreting. The tremie concreting when started should continue 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. The top section of the tremie shall have a hopper large enough to hold one full batch of the mix or the entire contents of the transporting bucket as the case may be. The tremie pipe shall not be less than 200mm 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 a uniform flow of concrete, but it shall not be emptied so that water is not allowed to enter above the concrete in the pipe. At all times after 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.

1.8.12 Protection and Curing:

Concreting operations shall not commence until adequate arrangements for concrete curing have been made by the Contractor.

Curing and protection of concrete shall start immediately after compaction the concrete to protect it from:

- a) Premature drying out particularly by solar radiation and wind
- b) High internal thermal gradients
- c) Leaching out by rain and flowing water
- d) Rapid cooling during the first few days after placing
- e) Low temperature
- f) Vibration and impact which may disrupt the concrete and interfere with its bond to the reinforcement.

Where members are of considerable size and length, with high cement content accelerated curing methods maybe applied, as approved by the Engineer.

1.8.13.1 Water Curing

Water for curing shall be as specified suitable for concreting.

Exposed surface 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 28 days from the date of placing of concrete.

1.8.13.2 Curing compound

Curing compound shall normally not be used. If proposed to be used, they can be permitted at selected locations, at the approval of the Engineer.

1.8.14 Finishing

Immediately after removal of forms, exposed bars or bolt, if any, shall be cut inside the concrete member to a depth of at least 50mm below the surface of the concrete and the resulting holes filled with cement mortar of dry pack consistency.

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.

The finished surfaces of concrete after removal of formwork should be such that no touching up is required. All fins caused by form joints, if any, shall be ground using electric surface grinder.

Immediately on removal of forms, the concrete work shall be examined by the Engineer before any defects are made good.

- a) The work that has sagged or contains honeycombing to an extent detrimental to structural safety or architectural appearance shall be rejected.
- b) Surface defect of a minor nature may be accepted. On acceptance of such work by the Engineer, the same shall be rectified as directed by Engineer.

1.8.15 Tests and Standards of Acceptance

1.8.15.1 Concrete shall conform to the surface finish and tolerance as prescribed in these specifications for respective components.

1.8.15.2 Random sampling and lot by lot of acceptance inspection shall be made for the 28 days cube strength of concrete.

1.8.15.3 Concrete under acceptance shall be notionally divided into lots for the purpose of sampling, before commencement of work. The delimitation of lots shall be determined by the following:

- a) No individual lot shall be more than 30 cum in volume.
- ii) At least three cube forming an item of the sample representing the lot shall be taken from concrete of the same grade and mix proportions cast on any day.
- iii) Different grades of mixes of concrete shall be divided into separate lots.
- iv) Concrete of a lot shall be used in the same identifiable component of the bridge.

1.8.15.4 Sampling and testing

- i) Concrete for making 3 test cubes shall be taken from a batch of concrete at point of delivery into construction, according to procedure laid down in IS: 1199.
- ii) A random sampling procedure to ensure that each of the concrete batches forming the lot under acceptance inspection has equal chance of being chosen for taking cubes shall be adopted.
- iii) 150 mm cubes shall be made, cured and tested at the age of 28 days for compressive strength in accordance with IS: 516. The 28 day test strength result for each cube shall form an item of the sample.
- iv) Frequency of testing for permeability: 2 sets of 3 samples for per girder.

1.8.15.5 Test Specimen and sample strength:

Three test specimens shall be made from each sample for testing at 28 day. Additional 3 cubes may be required for various purposes such as to determine the strength of concrete at 7 days for any other purpose.

The test strength of the sample shall be the average of the strength of 3 cubes. The individual variation should not be more than ± 15 percent of average.

1.8.15.6 Frequency:

The minimum frequency of sampling of concrete of each grade shall be in accordance with Table-4.

Quantity of Concrete in work, m³	No. of Samples
1 – 5	1
6 – 15	2
16 – 30	3
31 – 50	3
51 and above	4
	4 plus one additional sample for each additional 50 m ³ or part thereof

At least one sample shall be taken from each shift of work.

1.8.16 Acceptance criteria / As per IS 456/2000

1. Whenever a mix is redesigned due to a change in the quality of aggregate or cement or for any other reason, it shall be considered a new mix and initially subject to the acceptability criteria above.
2. If the concrete produced at site does not satisfy the above strength requirements, the Engineer will reserve the right to require the contractor to improve the methods of batching, the quality of the ingredients and redesign the mix with increased cement content, if necessary. The Contractor shall not be entitled to claim any extra cost for the extra cement used for the modifications stipulated by the Engineer for fulfilling the strength requirement specified.
3. It is the complete responsibility of the contractor to redesign the concrete mixes by approved standard methods and to produce the reinforced concrete conforming to the specification and the strength requirements approved by the Engineer. It is expected that the contractor will have competent staff to carry out this work.
4. As frequently as the Engineer may require, testing shall be carried out in the field for:
 - (i) Moisture content and absorption and density of sand and aggregate.
 - (ii) Silt content of sand.
 - (iii) Grading of sand and aggregates.
 - (iv) Slump test of concrete.
 - (v) Concrete cube test.

The Contractor shall provide and maintain on site at all times, until the works are completed, equipment and staff required for carrying out these tests. The Contractor shall grant the Engineer or his representative full access to his laboratory at all times and shall produce on demand complete records of all tests carried out on site.

Tests such as Permeability test for concrete as per DIN 1048 (Part-I), quality of Plasticizer, and other lab tests shall be undertaken through approved / accredited labs as agreed by Engineer.

Before concreting commences on any section of the works the Contractor shall obtain approval of the Engineer or his representative as regards the formworks and reinforcements conforming with the drawings. He shall also indicate to the Engineer in writing and obtain his approval for positions of

construction joints.

1.8.17 Cracks

- (i) If cracks develop in concrete construction, which in the opinion of the Engineer may be detrimental to the strength of the construction, the Contractor at his own expense shall test the construction item,. If under such test loads the cracks develop further, the Contractor shall dismantle the construction, carry away the debris, replace the construction and carry out all consequential work thereto.
- (ii) If any cracks develop in the concrete construction, which in the opinion of the Engineer, are not detrimental to the stability of the construction, the Contractor at his own expense shall grout the cracks with polymer cement grout of approved quality and also at his own expense and risk shall make good to the satisfaction of the Engineer, which in the opinion of the Engineer has suffered damage either in appearance or stability owing to such cracks. The Engineer's decision as to the extent of the liability of the Contractor in the above matter shall be final and binding.

1.8.18 Defective Concrete:

Should any concrete be found honeycombed or in any way defective, which may be suspected to affect the performance of the structure, shall be rejected outright. However, some surface defects like minor honeycombing etc. not affecting the structural properties shall on the instruction of the Engineer repaired as per the approved procedure.

1.8.19 TOLERANCE IN CONCRETE ELEMENTS

1) Open Foundation

- a) Variation in dimensions : +50mm – 10mm
 b) Misplacement from specified position on plan : 15mm
 c) Surface irregularities measured with 3m straight edge : 3mm

2) Substructure

- a) Variation in cross-sectional dimensions : +10mm – 5mm
 b) Misplacement from specified position in plan : 10mm
 c) Variations from plumb over full height : 10mm

3) PSC Superstructure

- a) Precast Concrete Superstructure :
 Variation in cross-sectional dimensions :
 i) Upto and including 2m : ± 5mm
 ii) Over 2m : ± 5mm
 b) Variation in length overall and length between bearings : Shall not exceed ±10mm or ±0.1 percent of the span length, whichever is lesser
 c) Variation in overall depth or width : ± 5mm

1.8.20 MEASUREMENT FOR PAYMENT

Structural concrete shall be measured in cubic meters as per actual volume. In reinforced or prestressed concrete, the volume occupied by reinforcement or prestressing cables and sheathing shall not be deducted. Payment may be made based on the dimensions as per the drawings if the structure is within prescribed tolerance.

Witness

- 1.
- 2.

Signature of Tenderer

Dated: _____

East Central Railway
Office of the Chief Administrative Officer (Con)
Mahendru ghat, Patna- 800004

SPECIAL CONDITIONS & SPECIFICATIONS FOR FABRICATION & ERECTION OF STEEL STRUCTURES

1. BOOKS OF REFERENCE:

- (i) IR Specification for Fabrication of steel girder bridge & Locomotives turn tables-(fabrication specification) - SERIAL No. BI-2001 issued by RDSO
- (ii) IS-800-1998.
- (iii) All IS & IRS specifications mentioned in RDSO Booklet serial No. BI-2001
- (iv) G.C.C. -2008 of East Central Railway
- (v) Where any specification is in conflict with other standard the clauses of Fabrication & specification mentioned against Sl. No. (i) Above shall prevail.

2. DRAWING:

- (i) Design drawing will be issued by Railway.
- (ii) The detailed working/fabricating drawing as any be required shall be prepared by the contractor at his own cost and submitted for approval.
- (iii) Detail launching/scheme/arrangement for erection of steel girder/structure shall be prepared by the contractor at his own cost and submitted to the Rly's for approval.

3. GUARANTEE AGAINST DEFECT :

The Tenderer will be required to give guarantee for a period of 6 month beyond the DOC/Extended DOC against any defect, that may develop either from bad materials supplied by the contractor or workmanship for which he may be held responsible.

4. INCLUSIVE PRICE:

- (i) The cost of all painting, temporary erection and testing at Tenderer's workshop, packing and delivery at the site of work as specified in the schedule, is to be included in the price quoted on the tender.
- (ii) Any fittings, accessories or apparatus which may not have been mentioned in the specification, but which are considered necessary for the execution of this work, are to be provided by the contractor without any extra payment. The work must be completed in all details.

5. MATERIALS/FABRICATION/WORKMANSHIP/ERECTION:

5.1 Fabrication workmanship and erection shall comply with RDSO fabrication specification Booklet Sl. No. Bi-2001.

5.2 Materials specification - Steel should conform to IS - 2062 – Gr. B.

- (i) Manufacturing - The whole work shall be representative of the highest class of workmanship. The greatest accuracy shall be observed in the design, manufacture and erection of every part of the work to ensure that all parts will fit accurately together on erection and similar parts shall be strictly inter changeable.
- (ii) The contractor shall maintain steel tape of approved make for which he has obtained a certificate of accuracy from any National Test House or Govt. recognized institution competent to do so.
- (iii) Rolled materials before being laid off or worked, must be made straight. If straightening or flattening is necessary it shall be done by method that will not damage the material. Sharp kinks and bents will be rejected.
- (iv) Tolerance - the tolerance in fabrication shall be in accordance with as mentioned in - Appendix - II of RDSO Fabrication Specification B-1-2001.
- (v) Fabrication records - the records of fabrication shall be maintained in the register as per format given in Appendix - 1 of RDSO Booklet B-1-2001.
- (vi) Flattening and straightening - All steel materials, plates, bars and structures shall have straight edges, flat surfaces and be free from twist. If necessary, they shall be cold straightened or flattened by pressure before being worked or assembled unless they are required to be of curvilinear form. Pressure applied for straightening or flattening shall be such as it would not injure the material and adjacent surfaces of edges shall be in close contact or at uniform distance throughout.
- (vii) Flattening or straightening under hot condition shall not be carried out unless authorized and approved by inspecting officer.
- (viii) The tenderer may fabricate the steel work at his own workshop or at the site of the work as is convenient to him. If the fabrication is done in his own workshop, the transportation or the fabricated materials may be done by road or rail transport at his own cost. The tenderer must inspect the

approach roads right from the workshop and should ensure that it would be possible for him to transport the materials by Road.

- (ix) If the tenderer proposes to fabricate the steel at site, the transport of steel section may be done by the one of the methods mentioned above. Suitable site would be given to the tenderer to make temporary workshop free of cost, if available, but on completion of work, the site would be restored to normal condition.

- (x) The responsibility of custody of the materials, in Tenderer's workshop or at site will remain with tenderer till the completion of work and then handed over to the railway.

6. **Templates**

The templates throughout the work shall be steel. The templates shall be used for making of cutting materials and as well as profile machining for girders of railway loading. Templates shall be used for drilling holes in steel structure other than girder of Railway. In case where actual materials from a bridge have been used as template for drilling similar pieces the inspecting officer will decide whether they are fit to be used as part of the finished structure.

7. **Methods of Measurements for fabrication of structural steel work & erection.**

7.1 Any steel work the weight of which differs by more than 2.5 % from the calculated weight determined from the normal weight of the section shall be liable to rejection.

7.1.1 Payment shall be made on the tendered weight to be calculated in accordance with the nominal weight of the sections as specified in final working drawing or based on theoretical weights given in producers hand books and using minimum overall dimensions, no deductions being made for skew cuts, holes or notches. Each gusset shall be on the dimensions of smallest enclosing rectangle.

An addition for welds and rivet heads should either be specified in the tender schedule or be made as follows:

(a) 3% in case of riveted or composite (riveted or welded) work.

(b) 1% in case of purely welded work.

7.2 Should the actual weight fall short of the calculated weight by more than 2.5 %, the material if accepted, will be paid for the actual weight only. Should the actual weight exceed the actual calculated weight, payment will be made for calculated weight only.

7.3 No separate payment shall be made for the field Rivets, Bolts, Nuts, wedges etc., and service accessories etc. required to complete erection at site with an allowance for waste etc.

7.4 In the event of a dispute arising as to the weight of a portion of steel work, a weighment shall be made in the presence of the inspecting officer.

8. **RIVETS & RIVETING:** Refer Fabrication specification Serial No. IRS-BI-2001 issued by RDSO-CL.23.1 to CL. 23.10 and appendix IV.

9. **BOLTS, NUTS & WASHERS:** Refer Fabrication specification Serial No. IRS-BI-2001 issued by RDSO - CL. 28-1 to CL 28.8

10. **WELDING:** Refer Fabrication specification Serial No. IRS-BI-2001 issued by RDSO-CL.26.1 to CL. 27.3 and appendix V.

11. **ALTERATIONS IN THE WORK :** Refer Fabrication specification Serial No. IRS-BI-2001 issued by RDSO-CL.53.1 to CL. 53.2 and appendix IV.

12. **ERECTION & EQUIPMENT:** Refer Fabrication specification Serial No. IRS-BI-2001 issued by RDSO-CL.21.1 to CL. 21.9 and appendix I

13. **ERECTION OF OPEN WEB GIRDER SPAN:** Refer Fabrication specification Serial No. IRS-BI-2001 issued by RDSO-CL.32.1 to CL. 34.8 and appendix III.

14. **HANDLING & STORAGE OF MATERIAL**

(a) The material, on receipt at site, shall be carefully unloaded, examined for defects, checked, sorted and stacked securely on a level bed out of danger from flood or tide, and out of contact with water of ground moisture.

(b) Any material found damaged or defective shall be stacked separately and the damage or defective portion be painted in distinctive color. Such material is to be dealt with under the orders of Engineer without delay.

(c) Care must be taken to see that parts at site are available in proper sections.

(d) The tenderer shall unload the materials promptly, on delivery from the wagon /BFR's otherwise he shall be responsible for demurrage charges.

15. **BEARING & ANCHORAGE:**

(ii) Bed plates and shoes shall be set level in exact position. They shall be given full and even bearing by setting them on a layer of cement mortar after blocking them accurately as directed by the Engineer.

- (iii) The tenderer shall drill the holes and set the anchor bolts except where the bolts are already built into the concrete or masonry. The bolt shall be set accurately and fixed with Portland cement grout completely filling the holes.
- (iv) Before grouting, the holes should be cleaned very carefully as such there should not be any deposit of and or rubbish etc. No extra payment will be made for that.

16. **TESTING:** Refer IR Fabrication specification Serial No. IRS-BI-2001 issued by RDSO CL.35.1 to CL 35.3 and appendix IV.

17. **CHECK TEST MADE AT CONTRACTOR:** Refer IR Fabrication specification Serial No. IRS-BI-2001 issued by RDSO Cl.36.1 to CL 36.2 and appendix IV.

18. **REMOVAL OF UNUSED MATERIALS ETC:**

- (a) The contractor shall take steps as desired by the Inspecting officer to ensure that rejected work is not resubmitted for inspection.
- (b) On the completion of the work, the tenderer shall remove all his unused and surplus materials, paints and staging or other materials produced from his operation and shall leave the site in a clean and tidy condition.

19. **INSURANCE:**

The contractor shall be responsible for all damages injury caused by their work or workmen to person, animals or things or to the work of other Tenderers and he shall affect any insurance necessary and held the employer free from all responsibilities in the respect. This insurance must be affected jointly in the name of the contractors and the East Central Railway and the policy lodged with the Engineer. The contractor is liable in respect of all or any expenses arising from and such injury to person or property as afore-said and also in respect of any claim made in respect of any award or compensation or damage, resultant from such claim.

20. **COMMENCEMENT OF THE ERECTION WORK AT SITE:**

The contractor shall commence the erection work when and as soon as, but not until, he receives instructions from Dy. CE/Con in-charge to do so. On such order being given possession of site/authority shall be given to the contractor of such portion or portions of the site as the Dy. CE/Con may determine.

21. **CONTRACTOR TO STUDY DRAWING & SPECIFICATION ETC AND HIS LIABILITY:**

The tenderer shall be responsible for close scrutiny of the drawing supplied by the Railway for any discrepancies, error or omission in the drawings or other particulars indicated therein and shall approach the railway immediately for rectification such discrepancies, errors and omission. In any dimensions/figure upon a drawings or plan differ from those obtained by calling the drawing or plan, the dimensions as figured upon the drawings of plan shall be taken as correct.

22. **CONTRACTOR TO SUBMIT HIS TIME TABLE :**

(i) The contractor shall have to give to the Chief Administrative Officer/Con and Dy.CE. Con a monthly progress of work done during the month by the 4th day of the following month. He will also give to Chief Administrative Officer/Con through Dy.CE/Con the programme of coming month by 25 th of each month. The programme will be subject alteration at the discretion of the CAO/Con, who may discuss such modifications or alteration with the contractor if he (CAO/Con) considers it necessary.

(ii) The time for any date of completion of the work as stipulated in chapter-II the Instructions to Tenderers shall be deemed to be the essence of the contract and the works must be completed in all respects not later than the date specified therein.

23. **ANY DOUBTED POINTS TO BE REFERRED TO THE ACCEPTING AUTHORITY/ CAO/CON:**

Should there be any doubt or obscurity as to any thing to be done or not to be done by the contractor, or as to these instructions or as to any matter or thing, the contractor must set forth such doubt or obscurity in writing and submit the same to Chief Administrative Officer (Con) Only such reply as the said Chief Administrative Officer (Con) May be in writing given shall be taken as the authoritative interpretation of the point in doubt or obscurity. Neither the Engineer nor any servant in the employment of the Railway have or has any authority to make any representative explanations to the contractor as to the meaning of the form of contract, General Condition and specification, schedule of quantities and rates, drawing or other documents or as to the condition of the work or site of as to the works, or as to these instructions or as to any other matter or things.

24. **LAND :**

The Railway administration will at his discretion arrange free of cost land to the extent separable for contractor's office at sites, field workshop, stores, assembly and erection yard. Land required by the contractor for labour or staff accommodation. or other purpose will have to be arranged by him at his own cost.

25. **TRANSPORTATION AND HANDLING OF MATERIAL & PLANT :**

The contractor shall be responsible to arrange at his own cost wagons (if required) or transportation or materials and stores (other than those which are being arranged by the railway) required for the works. The railway will however, render all possible assistance to him in getting allotment of wagons, but the Railway undertake no responsibility for delay in its supply. The contractor shall be responsible for all handling and timely loading and unloading as per railway commercial rule for public.

26. ISSUE OF MATERIALS BY RAILWAY:

If at any time any material or equipment which the contractor is required to arrange himself is supplied by the Railway either at the contractor's request or in order to prevent any possible delay in the execution of the works due to contractor's inability to make adequate arrangement for the supply, such material or equipments will be made available to or taken back from the contractor in the Railway's stores, Godown, All handling there from or there to will be the contractor's responsibility Recover of the cost of such supply will be made from the contractor's bills at the present market rate prevailing at the time of issue plus 5% on account of freight and 2% on account of incidental charges and 12.5% supervision charges. Any demurrage of other charges due on account of detention to wagon in loading or unloading will also be recovered from the contractor is not available in Railway's stock or the Railway decides not to supply the same be that for whatever reason, the quoted above or any other cost nor bill this fact be accepted as an excuse for delay in the execution of the work.

27. LOADING : Refer Clause 44.1 to 44.3 of IR Fabrication specification Serial BI-2001 issued By RDSO.

28. Metallising with sprayed ALUMINIUM: refer IR specification for fabrication Serial No. IRS-BI-2001 issued by RDSO appendix - VII.

29. FURTHER DRAWING AND INSTRUCTIONS:

1. ACCEPTING AUTHORITY/ CAO/CON shall have full power to make and issue further drawings or instructions or direction from time to time as may appear necessary and proper to the contractor for efficient construction completion and maintenance of the works. The contractor shall be bound by the same as fully as if they had been mentioned or referred to in the contract and the contractor shall not be entitled to any extra payment in respect of any work or materials shown or directed.
2. The Tenderer's rate should provide for cutting M.S plates for making out M.S. Flats from plates, in case Ms. Flats are not available. No extra payment for such cuts and grinding that may be necessary for converting M/.S. Plates to Flats will be admissible.
3. If the works are required to be done in by Rly Yard and Rly Tracks are to be crossed, the tenderer shall inspect the site and make him thoroughly acquainted with site condition and quote proper rate including provision for making suitable facilities at site for the work.
4. The work shall have to be done in such a manner that the normal working of the Railway within the railway yard does not get disturbed. proper protection is to be ensured by the contractor for allowing their labourers to cross the Railway lines with head-leads. No material/temporary structures should be kept adjacent to the running track within 3 M from the center line of track which may infringe rail traffic. The contractor shall take necessary precaution to prevent/ cause damage to the Railway property & staff during the execution of the work. These precautions are in addition to provision of the standard conditions and Specification on safety requirement detailed in Chapter II.

Witness:

1. _____

Signature of Tenderer(s)

2. _____

Date _____



East Central Railway
Office of the Chief Administrative Officer (Con)
Mahendrughat, Patna - 1180 004

ADDITIONAL SPECIAL CONDITIONS AND SPECIFICATIONS FOR STEEL WORKS & BEARINGS

1.0 GENERAL

This chapter covers the fabrication, assembly and erection of through type steel truss superstructure and bearings.

1.1 SITE INSPECTION

(i) The site of work is near Tatisilwey station of South Eastern Railway.

(ii) Tenderers are requested to inspect the site and carry out careful examination to satisfy themselves as to the nature of work involved and facilities available at the site. They should note carefully all the existing structures and those under construction through other agencies. They should also study the suitability of utilizing the different equipments and the machinery that they intend to use for the execution of the work. The tenderers should also inspect sites for the purpose of locating their workshop, store yard, laboratory, staff quarters etc., and satisfy themselves with regard to the feasibility of transporting the trusses from the yard to the final site of placement etc.

2.0 FABRICATION

2.1 General

(i) The fabrication of the girders and its accessories shall be carried out by the contractor in his factory premises or in a well-established fabrication workshop to be set up by the contractor at the bridge / site.

(ii) The workshop staff shall have requisite experience, proven skill and experience in the technique of fabricating large components. Accuracy of fabrication shall be realized and ensured through controlled high precision jigs, fixtures and templates, which shall be inspected and passed by **R.D.S.O/ Engineer/ Any other inspection agency/officer (herein after called I.O)** as nominated by the Railway.

(iii) **The fabrication shall be preceded by following :**

(a) Process Document Verification

S N	Process Document	Details
1	Approval of Quality Assurance Plans(QAP)	Stage-wise manufacturing process from raw material indicating various steps, tests, checks& their frequency, test equipment used, their calibration status, sampling plan, authority for grant of clearance
2	Scrutiny & Approval of welding procedure specification sheet(WPSS)	Process sheet indicating plate/section used, welding process, type of joint, welding consumables quality, welding parameters to be employed, acceptance standards and tests applicable etc.
3	Welders' certification and Qualification records(WPQR)	Name of the welder, qualification, experience, qualification tests and records for each welding process and joint, welding parameter etc.

Abovementioned Quality Assurance Plans etc are to be submitted by the contractor. The officials responsible for monitoring these identified quality parameters shall also be specified in these **Quality Assurance Plans etc. The contractor shall get above Documents, quality assurance plans etc. approved from RDSO/Engineer/I.O. before start of fabrication work.**

(b) Raw Material and Gauge Certification

S N	ITEM	Details
1	Inspection of Raw Materials	Source of purchase, Material Quantity, Size, Visual examination, mechanical properties, chemical composition, ultrasonic examination, Charpy Impact Test, Lab test reports etc.
2	Certification of raw materials	Verification of mill test certificates with test results obtained, cast wise identification of raw materials and ensuring their traceability clearance etc.
3	Inspection of Layout on template floor	Layout plan for manufacture of girders, detailed planning of components, sequence of fabrication etc
4	Inspection of Jigs, Fixtures and Master Plates.	Dimensional inspection of Jigs, fixtures, master plates used in manufacture of girder to ensure accuracy
5	Certification of Jigs, Fixtures and Master Plates	Stamping of Jigs, fixtures, master plates to certify their use during fabrication by the inspection officials.

Abovementioned Inspections, tests and certifications etc shall be done by RDSO/Engineer/I.O before start of and/or during fabrication works.

- (iv) The **RDSO/Engineer/I.O** shall be empowered to check the manufacturing process from time to time to ensure that the work is being executed as per approved quality assurance plans etc. The quality records shall be submitted to Engineer for record, after completion of fabrication work.
- (v) The work of fabrication in contractor's fabrication shop will, at all times, be open for inspection by **RDSO/Engineer/I.O**. Before dispatch of fabricated steel work from the shops, the same will be inspected in the contractor's fabrication workshop by **RDSO/Engineer/I.O** who will thereafter issue inspection certificate.
- (vi) The details of inspection items during and after fabrication are as under:

Inspections during fabrication

Sl No.	Item of Inspection	Details
1	Ensuring use of approved Raw Materials	Raw materials originally cleared only to be used during fabrication.
2	Ensuring use of approved Welding Consumables.	Types of consumables, source, quality, approval status, grade, suitability for fabrication as per WPSS
3	Ensuring use of approved Welders.	Checking of welders' certificates, records, skill and procedure adopted for welding as per WPSS etc.
4	Ensuring use of approved WPSS and Welding parameters.	Checking welding parameters employed, equipments used, correctness of joint preparation.
5	Radiographic examination of butt welds joints	Radiographic examination method, type of film employed, sensitivity, defect interpretation and acceptance decision based on criteria.
6	Ensuring use of approved sets of Jigs ,Fixtures and Master Plates	To ensure interchangeability of components and to avoid distortion.

(b) Inspections after fabrication

Sl No.	Item of Inspection	Details
1	Visual examination of welds	Quality of welds, uniformity of weld bead, size of the weld, weld defects e.g under cut, blow hole , porosity, spatter, cracks etc.
2	Metallographic and NDT examination of Fillet welds.	For ensuring proper weld quality. Dye penetration examination etc.
3	Structural and dimensional inspection	Dimensional checks to ensure conformance to drawing dimensions.
4	Trial Assembly.	Camber on Jacks, Dead Load Camber, Dimensions, Fairness of holes, Temporary Fasteners, Infringements, if any, Butting of compression flanges.
5	Anti Corrosive treatment	Surface preparation, metalizing and or painting as per applicable painting schedule.
6	Component Inspection	Detailed inspection of dismantled components of trial erected span and inspection of different components of second span onwards.

- (vii) Any defect noticed during inspection in the execution of work shall be rectified or replaced by the contractor at his own cost. The decision of **RDSO/Engineer/I.O** as to the existence of the defect and the manner in which the defective work has to be rectified or replaced, shall be final, binding and conclusive.
- (viii) During fabrication of the girder, necessary arrangement and provision shall be kept for inspection facilities underneath the girder and also for carriage of service cables, pipe lines etc as per approved plans.

3.0 MATERIALS

3.1 STRUCTURAL STEEL, RIVETS AND WELDING MATERIALS ETC.

- (i) Structural steel shall conform to specifications contained in RDSO approved drawings as amended/updated.
- (ii) The steel shall comply in all respects with the requirements of approved drawings and relevant codes and specifications and shall be procured from approved manufacturers only. All rolled sections shall bear cast mark and shall be of such length as to avoid butt welded joints in components of truss.
- (iii) The tenderer(s) shall supply information in the tender regarding source/manufacturers from where procurement of steel is proposed by him/them. However, the usage of type and grade of steel may vary during the execution of the work depending upon the design requirement and market availability. No claim shall be entertained from the contractor on this account and payment shall be as per relevant items in the schedule of items, quantities and rates.

- (ii) All welding consumables (electrodes, wire, flux etc.) shall be procured only from the manufacturers approved by RDSO subject to final approval by Engineer.
- (iii) In an extreme eventuality of steel of particular section not being made available locally by Indian Steel manufactures, the tenderer(s) may have to import steel. The imported steel shall be of equivalent specification. Use of built-up sections in place of rolled sections can be permitted. Working out the weight of steel for payment in such cases will be based on the actual sections used. Engineer will not take any responsibility of delays in importing the steel and no cognizance of the same will be given in the completion period.

3.2 TEST CERTIFICATES

- (i) All materials for the work shall pass tests and/or analysis prescribed by the relevant IS specifications or such other equivalent specifications.
- (ii) For all materials including rivets and bolts, the contractor shall furnish copies of test certificates from the manufacturers including proof sheets, mill sheets etc. showing that the materials have been tested in accordance with the requirements of various specifications and codal provisions.
- (iii) If any further testing of materials is required by the Engineer in respect of these and other items, the same shall be arranged by the contractor at a reputed laboratory/National test house/workshop Laboratory as directed/approved by Engineer. For this, nothing extra shall be payable and accepted rates in the schedule of items, quantities and rates shall be deemed to include this.
- (iv) Even satisfactory outcome of such tests or analysis shall in no way limit, dilute or interfere with the absolute right of the Engineer to reject the whole or part of such materials supplied, which in the judgment of the inspecting authority/ Engineer does not comply with the conditions of the contract. The decision of the Engineer in this regard shall be final, binding and conclusive for all purposes.

3.3 HANDLING AND STORING OF STEEL SECTIONS

- (i) All projecting plates or bars shall be kept in shape by timber or angle bars spiked or bolted to them at the ends of chord lengths. End posts etc at their shipping joints shall be protected and stiffened so as to prevent damage or distortion in transit as the Engineer may direct/approve.
- (ii) All threaded ends and machined surfaces are to be efficiently protected against damage in transit. The parts shall be transported in convenient lengths.
- (iii) All straight bars and plates, except small pieces are to be transported in convenient bundles temporarily riveted or bolted together or bound with wrought iron or suitable wire as the Engineer may direct/approve. All rivets, bolts, nuts, washers, plates under 300mm square and small articles are to be packed separately for each span, weighing, not more than 350 kg in strong petroleum casks or barrels as approved by Engineer. If not entirely filled by the contents the space left shall be closely packed with wood shaving or other suitable material. Bolts and rivets of different sizes shall be separately packed in bags, each bag having a label indicating its contents. A list of contents shall be placed on top of each case or cask.
- (iv) All rolled steel received from supplier shall be carefully unloaded to avoid twisting, bending and damage to mill scale. Stacking area shall be covered and the materials placed on a raised platform above ground level. Every care shall be taken to avoid contact with water /moisture or any other harmful substance in order to prevent rusting and pitting.
- (v) All sections damaged during transit or handling shall be stacked separately and damaged portions shall be indicated by paint of distinct colour. Such materials shall be dealt with as per instructions of the Engineer. Badly damaged portions may require replacement. Slightly distorted parts or broken parts must be dealt with as the case demands and as directed/ approved by Engineer. The rectified sections shall be used for fabrication only after approval of Engineer.
- (vi) Where the work has been passed in the manufacturer's factory premises as strictly interchangeable, all members bearing the same marks can be stacked together without reference to any particular position. Care must be taken by the contractor that the parts at site are available in proper sequence. Every portion of work shall be distinctly stenciled with paint and marked with the punch not less than 15mm dia for guidance in erection in the field, and stamped with the letters specified in the drawings. In the case of non-interchangeable work, the system of marking shall be as shown in drawing.
- (v) All field rivets for site riveting, service bolts and drift for assembly of girder, shall be stored under cover.
- (vi) The contractor shall supply without any charge, six complete lists of the rivets, bolts, service bolts, washers and drifts required for erecting the work at site, showing the parts of the work to which the various rivets and bolts belong and having each item marked so as to indicate the particular case in which it will be found. List of total rivets required for one girder/ stating length, numbers, and wastage allowance of 12.5% shall be prepared and supplied along with the span components. The requirements for service bolts is @ 45% and that of drifts @ 15%; covering 60% of field holes in one span plus wastage allowance of 12.5%. Engineer reserves the right to increase the above proportion of service bolts and drifts without any extra cost. Actual requirement for the work shall be assessed by the contractor who shall arrange accordingly at his own cost.

4. WELDING OF COMPONENTS

- (a) All welding work shall be as per IRS Standard and by such process that the workmanship is flawless. **All welding shall be by automatic and semi-automatic submerged arc welding process, except where inaccessible.** Site welding shall be avoided, but if necessary, shall be carried out only on secondary members having low stresses to transmit across the joint for which approval of the Engineer shall be required.
- (b) Welded construction shall be carried out generally in accordance with provisions of the IRS Welded Bridge Code and IS:9595 (Metal Arc Welding) and further subject to specifications as under:
- (i) Welding shall be done only by qualified and approved welding operators, whose competency has been verified and certified by **RDSO/Engineer/I.O.** Routine re-testing of welding operators may be required every six months if deemed necessary by the Engineer who also reserves the right to retest any welding operator at any time during the contract.
- (ii) All long and continuous welds shall be carried out by automatic Submerged Arc Welding (SAW) process only, in order to obtain sound and uniform shape and cross section. CO₂ or manual metal arc welding (MMAW) may be done for short lengths or for secondary connections where access to the location of the weld does not permit Submerged Arc Welding (SAW), subject to approval of Engineer.
- (iii) The contractor shall appoint welding supervisors whose competence and qualification shall be subject to approval of **RDSO/Engineer/I.O.** All welds shall be carried out directly under their direction & supervision.
- (iv) Welding position for fabrication of components shall be Flat or Horizontal position for SAW (flat position preferred) and Flat or Horizontal position for CO₂ or manual metal arc welding.
- (v) To ensure above position for welding, component shall be placed in a manipulator, tack assembled and rotated in the manipulator to assist welding sequence and prevent distortion of member. In absence of manipulator, special jig and fixtures shall be provided for positioning and careful handling by crane, subject to approval of Engineer.

5. WELDING PROCEDURE

The welding procedure shall be such as to avoid distortion and minimize residual shrinkage stresses. Properly designed jigs should be used for assembly. The welding techniques and sequences, quality, size of electrodes, voltage and current required shall be as prescribed by manufacturers of the material and welding equipment. The contractor should submit full details of welding procedure in pro-forma given at Appendix-V of IRS B1 – 2001.

6. SEQUENCE OF WELDING AND WELDING PASS

The sequence of welding and welding pass shall be done as per IRS B1 – 2001.

7. WELD QUALITY TESTS

A. PROCEDURE TRIALS

Welding and flame cutting trials as per following shall be carried out and completed before fabrication on representative samples of materials to be used in the work;

- i) The samples of material shall be selected and marked by the Engineer when the materials for the work are inspected in contractor's fabrication yard / store.
- ii) The trials of flame cutting shall be carried out in material representative of all thicknesses to be used in the work.
- iii) Trials on material 19mm thick may be taken to include all material under 19mm thick and on material 38mm thick to include material between 19mm and 38mm thick. Over 38mm thickness material shall be tested for every thickness increment of 6mm. The trials of flame cutting shall be carried out in material representative of all thicknesses to be used in the work.
- iv) The welding & flame cutting trials shall be commensurate to the satisfaction of Engineer/Inspecting Officer and the procedures to be adopted in the fabrication of work which shall include:
- a) Welding procedure in accordance with relevant specification.
 - b) Heat control techniques required to ensure that the flame cut surface of steel are suitable for inclusion in welds.
- v) The trials shall include specimen welds from the actual construction which shall be welded in a manner simulating the most unfavorable instances of fit-up and preparation. After welding the specimens shall be held as long as possible at room temperature but in any case not less than 72 hours, and then shall be sectioned and examined for cracking. Six representative samples of each weld joint similar to joint used in fabrication of all components shall be prepared by qualified and certified welding operators.
- vi) Following groups of tests shall be carried out:
- a) **Butt welds:** Transverse tensile test, transverse & longitudinal bend test with the root of weld in tension and compression respectively, Charpy V-notch impact test.

- b) **Fillet welds:** Fillet weld fracture test.
- c) **Tack welds:** Inspection for cracking
- d) **All welds:** Macro examination.

B. Additional tests as under shall also be carried out for approval and during contract executions stage, as per requirement and instructions of **RDSO/Engineer/I.O.**, the cost of which shall be borne by the contractor. Following tests are normally performed on welds;

(a) Non Destructive Tests (NDT):

- Visual inspection/profile gauge for dimensional check of size and throat thickness of weld.
- Etching test for penetration of Weld.
- Magnetic particle or Ultra Sonic Pulse Velocity (USPV)
- Gamma Radiography & X-ray (only for butt welds)
- Dye penetration of all weld joints.

(b) Destructive Test:

- Tensile test
- Bend test
- Impact test

Once samples representing the weld joint used in fabrication of all components are tested and test results are found satisfactory, then approval shall be taken from the Engineer/Inspecting Officer for the welding of built up components by approved welding operators. **Welding Procedure Qualification Records (WPQR's)** shall be prepared which shall include joint details, welding consumables (i.e. electrode/wire & flux combination), weld parameters (i.e. welding current, wire feed speed), welding position, welding equipment carriage speed (for SAW process), arc Length, arc voltage etc.

C. Qualification and Testing of welders:

- (i) No welding operator shall be employed on the work until he has, in the presence of the **RDSO/Engineer/I.O.**, passed the appropriate tests laid down in relevant specification.
- (ii) Where plates of 12mm thick and over are to be butt welded the tests set out in relevant specification is to be followed.
- (iii) Routine re-testing of welding operators may be required every six months if deemed necessary by the **RDSO/Engineer/I.O.**
- (iv) The **RDSO/Engineer/I.O.** reserves the right to require any welding operator to be re-tested at any time during the contract.

8 Precautions during welding

- (i) The Contractor shall submit list of weld joints of different combined thickness for approval of welding procedure for all members.
- (ii) The welding of built up component shall be carried out only by approved welding operators and in accordance with Welding Procedure Qualification Records. WPQR's shall be prepared in advance and approved by the Engineer. Proper welding sequence shall be followed to avoid distortion and minimize residual shrinkage stress, and surface defects, within acceptable tolerance limits.
- (iii) To ensure sound and defect free welding of built up members, record of welding adopted as per approved qualifying procedure shall be maintained in Performa prescribed in guidelines for welded fabrication issued by RDSO or as stipulated in IRS-B1-2001.
- (iv) Any change during welding for fabrication of built up member, such as welding sequence, welding process, positioning, wire and flux combination, joint details, increase or decrease in combined thickness of joint by 5 mm etc. shall be carried out only after representative samples test and procedure qualification, is accepted. **In no case any deviation from WPQR's without approval of Engineer shall be permitted.**

20 FULL PENETRATION BUTT WELDING WITH RADIOGRAPHY TESTING:

May be done with the prior approval of The RDSO/Engineer/I.O.

21 PAINTING

Specifications for metalizing and painting of bridge girders shall be as per IRS:B1-2001.

21.6 PAINTS FOR PAINTING OF STEEL WORKS: SOURCE, QUALITY & TESTING

- (i) Paint and other accessories including those for metalizing work will be supplied by the contractor. Paints manufactured only by the following firms may be used subject to their being in the approved list of RDSO and final approval by the Engineer.
 - M/s. Jenson Nicholson paints.
 - M/s British / Berger paints.
 - M/s Shalimar Paints
 - M/s I.C.I. paints.
 - M/s Nerolac. Paints.

- (ii) In case above brands are not on approved list of RDSO, the contractor shall submit proposal of alternate brands borne on approved list of RDSO.
- (iii) Railway may involve them in testing of paints at manufacturer's premises. Final approval of paint, however, will be given by Railway at work site after paints are brought at site and inspected and tested for quality, which are possible at site. Sample at the discretion of Railway, however, may be sent for testing in reputed labs to verify the Manufacturer's test reports at Contractor's Cost.
- (iv) The contractor shall furnish to the Engineer, the date of manufacture of paint as certified by the manufacturers with the necessary container marking and test certificate for paint conforming to relevant IS code. In addition to this, he shall also submit the necessary vouchers in respect of paint purchased by him.
- (v) The Engineer reserves the right to get the paint tested at contractor's expenses as considered necessary by the Engineer. If the test results do not conform to relevant IS specifications fully, then the lot of paint shall be rejected and got removed from the contractor(s) storage. If the paint has already been applied it shall be removed.
- (vi) In addition to above, the following tests are required to be carried out in the field.
 - Weight per litre.
 - Consistency test
 - Scratch test.
 - Flexibility and adhesion test.
- (vii) The Engineer reserves the right to reject the lot of paint even on the basis of field results.
- (viii) Self life of the paints shall be as per provisions in the IRS-B1-2001/Indian Railway Bridge Manual 1998 or as approved/directed by the Engineer.

21.7 PAINTING - GENERAL INSTRUCTIONS Painting shall not be commenced till the surface preparation has been approved by the Engineer or his representative or inspecting officer.

- (i) Sealed containers of paint of approved brand shall be used. The paint drums must be rolled, turned upside down and shaken before opening. The paint must be stirred well before use. Over stirring which results in invisible air bubbles etc, shall be avoided.
- (ii) Where brush painting is accepted, the paint must be applied by means of flat brushes not more than 75mm in width having soft flexible bristles conforming to IS:384.
- (iii) Round and oval brushes of approved quality conforming to IS: 487 may also be used as per the instructions of the Engineer or his representative or inspecting officer.
- (iv) All new brushes should be soaked in raw linseed oil conforming to IS: 77 for at least 24 hours before use.
- (v) A little blue paint shall be added, in the first coat of aluminium paint to distinguish it from second coat. For paints of other colours for final and finishing two coats, suitable pigment shall be used as per instruction of the Engineer, to distinguish the first coat from the second coat.
- (vi) The date of painting shall be marked with paint on the member.

21.8 CARE DURING PAINTING

Paint should be mixed in small quantities sufficient to be consumed within one hour in the case of red lead paint.

The applied coat of paint shall be uniform, and free from brush marks, sack marks, blemishes, scratching, non-uniform thickness, holes, log marks, fuel staining, cracking, scaling, and other defects.

Paint shall be applied only on dry and clean surface free from moisture or dust (including scrapping dust).

Paint should be used within the prescribed shelf life from the date of manufacture.

- 21.9** Each coat of paint shall be left dry till it sufficiently hardens before the subsequent coat is applied. Each coat of paint shall be inspected by the Engineer or inspecting officer and certified as satisfactory before applying subsequent coat.

21.10 PAYMENT

The payment for complete painting of all components of girders including all accessories, painting of contact surface etc including all labour and material, is included in the accepted rates for item in the schedule of items, rates and quantities and nothing extra shall be paid.

22.0 ASSEMBLY & ERECTION

22.1 General

- (i) The contractor shall provide at his own cost all tools, machinery, equipment and erection material, including all temporary works and shall assemble all components in every respect as stipulated in the contract and in accordance with approved scheme, drawings and specifications.

- (ii) Before starting the work the contractor shall seek the Engineer's approval as to the method he proposes to follow and the type and suitability of equipment he proposes to use for assembly of girder components and launching of girder.

The approval of the Engineer shall however not in any way relieve the contractor of his responsibility for the adequacy and safety of methods and/or equipments he proposes to use for carrying out the work in accordance with drawings and specifications.

- (iii) All temporary works shall be properly designed and fabricated & erected with great care for the loads, which they will be called upon to support. Adequate allowance and provision for the effect of lateral forces and wind loads shall be made to meet unforeseen conditions.
- (iv) When chains are used for lashing, care must be taken to protect the edges of members from twisting and distortion, damage to paint and similar effects.
- (v) Temporary bracing shall be provided to take care of stresses caused by erection equipment or other incidental loads during erection.
- (vi) The method used for lifting and slinging flexible members shall be brought to the notice of the Engineer and shall be subject to his approval.
- (vii) The contractor shall observe sufficient accuracy in the assembly of every part of the work to ensure that all parts fit accurately together.
- (viii) Contractor shall take all necessary precautions for safety of the substructure of this Bridge and substructure and superstructure of approach viaducts, during assembling, erection & launching works of the girders at his own cost. In addition, the contractor shall adopt all precautionary measures for safe plying of inland vessels, boats, crafts etc. at his own cost.

22.2 PROCEDURE FOR ASSEMBLY IN WORKSHOP & SITE

The contractor is required to undertake test assembly of **one girder of each type of span** in his fabrication workshop to prove accuracy of templates and jigs. This assembly can be done in horizontal position. In case the fabrication workshop is set up by the contractor at bridge site itself the test assembly may be done at assembly platform and after testing of accuracy of jigs, fixtures & templates and the camber, the same assembly can be launched after riveting/ welding.

The test assembly shall be certified by **RDSO/Engineer/I.O.**

Following procedure may be used by contractor subject to checking of design by contractor's consultant and final approval by the **RDSO/Engineer/I.O.**

22.5 Transports from Workshop & Stacking at Site

All items fabricated in the workshop shall be marked and packaged with accompanying package list. The items after fabrication shall be transported by contractor to site by Road in a manner as to cause no damage to the components. Contractor shall be liable for all losses and damages in transit for the materials consigned by him till materials are erected & launched and work completed and taken over by the Engineer. Insurance against loss or damage in transit, if any, shall be the responsibility of the contractor.

After identification & correct marking, all components of each girder shall be dismantled & similar components shall be grouped together & labeled; rivets bolts and plates of each size shall be packed separately in the manner described elsewhere in this tender document, after approval by the inspecting authority.

The packages shall be of such size by length & weight that they are safely transportable by Road. The components shall be provided with necessary packing to avoid damage to painting & members in transit.

Dimensions for transport shall be as per standard approved schedules.

Assembly and Launching

- (i) The assembling of components at site to required camber and grade along bridge axis, preceding additional temporary structures and accessories for launching of girders and all related matters shall be full responsibility of the contractor.
- (ii) The launching of girders shall be done as per approved drawings. For this purpose, the contractor shall submit in triplicate, detailed launching schemes of all the girders including design calculations, safety procedures and method statement with such plans, sketches and other details as may be necessary to determine the suitability and adequacy of the schemes proposed. The methods adopted shall not, under any circumstances, cause the stresses in various members of girder spans to exceed permissible and safe limits at any stage of launching. One copy duly approved by the Engineer shall be returned to the contractor.
- (iii) For the Engineer's use and record, the contractor shall supply free of charge, four sets of prints on strong paper and one set of neatly executed tracings on linen of approved detailed drawings for assembly and launching schemes for use at site.

- (iv) The contractor shall provide full structural details of the temporary members and their connections to the girder, along with necessary design calculations not only justifying members sizes but also of the entire launching system adopted. Contractor shall provide full structural details of the temporary member and their connections to the girder, along with necessary design calculations not only justifying members sizes but also of the entire launching system adopted. Contractor will be responsible for getting approval of launching scheme submitted by him from the Engineer.
- (v) The launching system shall be test tried if directed by the Engineer and no separate payment for this shall be made.
- (vi) Nothing extra will be paid to the contractor for adopting any scheme for launching and the costs are to be covered in the relevant item in the schedule of items, quantities and rates. All temporary members shall be removed after launching and may be taken back by the contractor. Erection gussets provided for connecting the members may be cut and edges ground as directed /approved by the Engineer.

22.8 PERMANENT/TEMPORARY STRENGTHENING

The launching arrangement may include fabrication of launching nose or restraining girders, sway restraining devices such as sway ropes, restraining cables etc, the supply and fixing of members for temporary strengthening of girder members to take care of erection stresses and strains and other relevant components for satisfactory and successful completion of the defined scope of work. Erection stresses must be kept within safe and permissible limits at every stage of erection.

The contractor has to make arrangements at his own cost for the steel for temporary arrangements including sway restraining devices for launching and temporary strengthening of girder, as may be required for the launching operations. The rate quoted should take into account these factors as nothing extra shall be paid.

Launching scheme may also require permanent strengthening of some members. In such case, all additional steel (over and above approved payable weight /DODL as per approved structural drawings) required for permanent/temporary strengthening for proper launching/erection of the girders shall be arranged by contractor at his own cost. Railway shall be responsible for issue/payment of steel only to the extent of approved payable weight as per respective schedule of item.

In case the modified section of the steel required for permanent strengthening is supplied by the contractor under Schedule "C-III", then also the payment shall be made only for the approved weight as per respective schedule of item. In case the modified sections required for permanent strengthening are supplied by the Railway under clause 41 of chapter-III of these documents, then the cost of additional weight requirement shall be recovered from the contractor's bills. Cost shall be calculated using the rate of steel of equivalent specification as accepted in Schedule "C-III" of these documents.

22.9 INSPECTION AND RECTIFICATION

During erection of girders, the contractor shall provide all facilities and permit the Engineer to inspect the field assembly, site riveting and erection of spans to the satisfaction of engineer.

After inspection by the Engineer/ Inspecting agency, the contractor shall identify cause of any defect, imperfection and/or fault noticed during such inspection and initiate corrective action as per the direction of the Engineer. All defects, imperfections or faults, shall be made good by the contractor to the Engineer's satisfaction and the cost of identifying and rectifying such defects, imperfection or faults shall be borne by the contractor.

23. Methods of Measurements and stage payment in respect of fabrication of structural steel work & erection and other items of the contract.

23.1 MEASUREMENT

- (i) For the purpose of payment, quoted rates apply to the weights of steel work calculated from final working drawings based on nominal weights given in the producer's hand books and using minimum square overall dimensions, no deductions being made for skew cuts, holes or notches. Each gusset shall be measured as equivalent to the dimension of the smallest enclosing rectangle. **The wastage of steel in the form of skew cuts etc shall be the property of the contractor.**
- (ii) An addition of 1.5% shall be made to the member quantities as arrive above, to account for the weight of rivets and welds.
- (iii) The drawing office dispatch lists (D.O.D.Ls) when prepared according to above procedure (i.e (i) and (ii) as above) shall be submitted by the contractor to the Engineer for approval.
- (iv) Any steel work the weight of which differs by more than 2.5% from the calculated weight determined from the nominal weight of the sections shall be liable for rejection.
- (v) Should the actual weight fall short of the calculated weight by less than 2.5%, the material if accepted, will be paid for the actual weight only. Should the actual weight exceed the actual calculated weight, payment will be made for calculated weight only.

- (vi) In the event of a dispute arising as to the weight of a portion of steel work, a weighment shall be made in the presence of the inspecting officer/Engineer.

23.2 STAGES OF PAYMENT (Not Applicable)

(i) ~~Schedule of Stage Payments for the item of FABRICATION, ERECTION AND PAINTING under schedule A. (Item no. 1)~~

	Part item/activity of the work	Payment	Remarks
(i)	On fabrication of girder components as per approved drawings and specifications and its actual certification by RDSO/Engineer/Inspecting agency. (Against Bank Guarantee (BG) in case of fabrication in contractor's workshop away from the bridge site and against Indemnity Bond in case of bridge site workshop in Railway premises.) BG should be valid for at least a period of six months beyond DOC, and the contractor shall extend the validity if necessary.	35%	Only 80% (of this 35%) payment shall be made till trial assembly of one span for each type of girder. Balance 20% (of this 35%) shall be released after successful trial assembly. 100% (of this 35%) shall start getting released once the successful trial assembly of first span has been done.
(ii)	On completion of launching/erection of girder components on service bolts and drifts as per drawings contract conditions and specifications and its actual certification & passing by Engineer.	30%	For one complete span.
(iii)	On completion of field riveting/welding.	25%	For one complete span.
(iv)	On completion of surface preparation cleaning and sand blasting, metalizing application of base coats and one coat of finish coat of aluminum.	3%	For one complete span.
(v)	On completion of second finish coat of aluminum at site.	2%	For one complete span.
(vi)	On lowering of the girders on bearings and its centering/aligning and fixing and grouting of the bearings etc.	5%	For one complete span.

(ii) ~~Schedule of Stage Payment for the item of providing BEARINGS and ANTI-SEISMIC arrangements under schedule A. (Item no. 3 & 6)~~

SN	Part item/activity of the work	Payment	Remarks
(i)	On receipt and passing of complete set of bearing in the contractor's workshop at site. (against Indemnity bond)	70%	As per actual quantity.
(ii)	On placing of the bearings and anti seismic arrangements on the bearing pedestals/pier cap and grouting, leveling and centering etc.	10%	For actual quantity.
(iii)	On lowering of girders on bearings and its centering/aligning and grouting of bearing etc.	20%	For actual quantity

III) ~~Schedule of Stage Payments for the items of Structural Steel supply under Schedules C~~

Sl. No.	Part item/activity of the work	Payment	Remarks
(i)	On receipt of material in contractor's workshop/store at site. (Against Bank Guarantee in case of supply in contractor's workshop away from the bridge site and against Indemnity Bond in case of bridge site workshop in Railway premises.) BG should be valid for at least a period of six months beyond DOC, and the contractor shall extend the validity if necessary.	70%	For actual quantity. Necessary adjustment shall be done as per approved payable weight at the stage of payment of balance 30% as per (ii) below.
(ii)	On use of material in the works under various schedules.	30%	As per approved quantity. For items of schedule C, out of balance 30%, 20% shall be released after fabrication of girders in the workshop and its transportation to site and remaining 10% shall be released after erection of girders and field riveting/welding.

~~23.3 Indemnity bonds and Bank Guarantee Bonds shall be submitted in the pro-forma approved/stipulated by the Engineer.~~

~~23.4 Materials shall be brought to site as per approved schedules by concerned CE/C and commensurate with Bar Chart submitted by contractor at the start of Work.~~

24. DEVIATION FROM SPECIFICATIONS

The contractor may extend suggestions for member substitution, fabrication method, launching procedure and the like; provided the fundamental character such as area & stiffness of the member and the connections are not adversely affected and preferably remain unchanged. The decision of Engineer shall be final and binding on all such proposals made by the contractor. Nothing extra will be paid to the contractor for such deviations. The contractor shall document all such deviations for the Engineer's record. Entire cost of structural analysis shall be borne by the contractor.

25. CONTRACTOR(S) LIABILITY

Any fitting, accessory or apparatus which may not have been mentioned in this specification or the drawings, but which are usual or necessary in the execution of such work, are to be provided by the

Contractor without extra payment. The whole work must be completed in all details, whether mentioned in this specification or not, with the exception of such work as has been specified in the schedule of items to be separately provided for in the Contract.

Notwithstanding the specifications and conditions stated in the contract, the contractor shall keep the Engineer/Employer authority fully indemnified and free from all liabilities and risks consequential to any lapse on his part in respect of material quality, standard of workmanship, accuracy of fabrication and the like. He shall provide all labour and material required for execution of the work as per listed standards and in absence of any IRS & IS specifications, to the relevant British standards.

26.0 ADDITIONAL REQUIREMENTS FOR SUPERSTRUCTURE

26.1 The railway track on this Section may be electrified in the future. In order to preclude the effect of electric corrosion if any, on account of long stay current due to induction, necessary measures will be taken to equalize the electric potential. The superstructure should be isolated from the bed block by suitable elastomeric plates or other insulating material under the bearings.

26.2 The suitable ladders, inspection galleries, inspection platforms etc. shall be provided as per approved drawing.

26.3 The bearing shall be provided as per specifications and requirements. Anti-seismic arrangements shall be provided as per approved drawings.

26.4 Steel Chequered plates 620mm wide and 6 mm thick, conforming to IS 2062/ IS 3502 shall be used for pathway, man refuge floor etc. for entire length of the bridge. The payment for this shall be made as per relevant item in the schedule of items, quantities and rates. The cost of fixing (including fasteners) to girder component/sleepers shall be deemed to be included in relevant item rate and shall not be paid extra.

27. **Seating of bearings shall be as per manufacturer's and Railway's recommendations.**

27.1 Name Plate:

A neat casting bearing the name of the contractor, the place and year of manufacture, the standard of loading to be specified by the Engineer shall be bolted conspicuously on all girders. The drawing of the name plate shall be approved by the Engineer

27.2 Erection Mark :

Every portion of the work shall be distinctly stenciled with paint with letter size not less than 10mm for guidance in the erection in the field, and stamped with the letters specified in the drawings. In the case of non-interchangeable work, the system of marking shall be in accordance with the drawings prepared by the tenderer and approved by the Purchaser.

27.3 Tracings and Printings :

Excepting in the case of standard spans fabricated without any modifications to the standard drawings the Contractor shall supply free of charge, one set of neatly executed tracing on linen. They shall be fully dimensioned and contain all erection marks, notifications printed, the name of the Contractor and any alterations from the contract drawings, which may have been made in executing the work. The drawings shall conform to standard sizes as given in IS:962 and shall not exceed A0 size. The drawings shall not be folded but rolled outwards on a roller, in addition, three sets of full size copies on strong paper, are to be provided.

27.4 Rivets and Bolts Lists. :

The contractor shall also supply, without charge, six sets of complete lists of the rivets, bolts, service bolts, washers and drifts required for erecting the work at site, showing the parts of the work to which the various rivets and bolts belong and having each item marked so as to indicate the particular case in which it will be found.

27.5 Photographs :

The contractor shall also supply without charge, two sets of large well-executed, unmounted photographs of the first span of each description of truss bridge when erected, taken from two points of view and showing the erection marking as clearly as possible

27.6 Attestation of Tracings etc.

The tracings, photographs and lists shall be examined and signed by the Inspecting Officer/Engineer. They shall be supplied with the first installment of the work delivered.

28 Testing :

The inspecting officer/Engineer shall be empowered, at his/her discretion to make or have made under the supervision, any of the tests specified in the specifications mentioned herein in addition to such other tests as he/she may consider necessary, at any time up to the completion of the contract and to such an extent as he/she may think necessary to determine the quality of all materials used therein. In doing so, he/she shall be at liberty under any reasonable procedure, he/she may think fit to select, identify, have cut-off and take possession of test pieces from the material either before, during or after its being worked up into the finished product.

28.1 He shall also be empowered to call for a duly authenticated series of mechanical tests to be obtained from the manufacturer of the materials used in the work and to accept the same in lieu of other tests

to the extent he/she deems fit. The contractor shall supply the material required for the test pieces and shall also prepare the test pieces necessary at his own cost.

28.2 The test shall be carried out by the contractor, for which contractor shall provide all facilities including supply of labour and plant. Inspecting officer may at his/her discretion direct the contractor to dispatch such tests pieces as he/she may require to the National Test House or elsewhere as he/she may think fit for such testing purposes

28.3 Check on Tests made at Contractor's work.

28.3.1 The Inspecting Officer/Engineer, may at his/her discretion, check test results obtained at Contractor's work by independent tests at National Test House/or any other recognized laboratories, as nominated by the Inspecting Officer.

28.3.2 The Inspecting Officer/Engineer shall at all times be empowered to examine and check the working of the contractor's plant before and after using it. Should the contractor's plant be found, in the Inspecting officer's opinion, unreliable, he/she is empowered to cancel any tests already carried out in this contract and have these tests carried out at any National Test House or elsewhere, as he/she may think fit.

29. Analysis.

The contractor shall supply authenticated copies of analysis of any materials used in the work when required to do so by the Inspecting Officer/Engineer who shall be empowered to accept them to the extent he/she thinks fit. In addition to the above samples may, at the Inspecting Officer's/Engineer's discretion be subjected to complete analysis at the National Test House or elsewhere as the Inspecting officer may determine, the cost the same is to be borne by the purchaser.

30. Inspection (General):

The Inspection Officer/Engineer shall have free access to the works of the Contractor at all times and shall be at liberty to inspect the process of manufacture at any such time and to reject in whole or part, any work or material that does not conform to the provisions of this specification and may order the same to be removed, replaced or altered at the expense of the contractor. All gauges and templates necessary to satisfy the Inspecting Officer of the complete interchangeability of parts must be supplied by the contractor free of cost.

31. SCHEME OF LAUNCHING

31.1 Detailed launching drawings/ schemes based on the approved structural and fabrication (shop) drawings shall be developed by the contractor at their own cost and the same will be submitted after proof checking from the reputed Institutions/Consultants. Some of the reputed consultants are listed below:-

- (i) IIT Delhi / Roorkee/Kanpur/Chennai.
- (ii) IT/BHU.
- (iii) RITES Ltd.

The detailed launching scheme after proof checking from reputed institutions / consultant shall be submitted to Engineer for approval. Entire cost of proof checking, alteration/ modification/ strengthening of members/joints etc. shall be borne by contractor. Rate quoted by Contractor for different items should include this aspect. Contractor will have to check the design of the members of the girders/truss and if any modification/alteration/strengthening of any member is required for any additional stresses, the same shall be done by the contractor at his own cost. **Nomination of the Institution/Consultant for proof checking works will be approved by concerned Chief Engineer/ Con.**

31.2 Engineer will make all efforts to approve the drawings submitted by the contractor within reasonable time but no claim for any delay on this account shall be entertained by Engineer. However required time extension may be granted by the Engineer without any extra claim payable to the Contractor.

31.3 For Engineer's use and record, the contractor shall supply free of charge, four sets of prints on strong paper and one set of neatly executed tracings of all approved detailed drawings and fabrication drawings, soon after communication of approval, for use at site.

Witness

1.

Signature of Tenderer 2.
Date _____

End of Tender Document

