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For Company use only

The information given in this report is not to be communicated either directly to the press or to any person not holding an official position in the CIL/Govt.

Central Coalfields Limited

(A Subsidiary of Coal India Limited)

(A Miniratna Cat-1 Company)

TENDER CUM AUCTION DOCUMENT
FOR
DESIGN, SUPPLY, RENOVATION, COMMISSIONING AND TESTING
OF
EXISTING RAPID LOADING SYSTEM ALONG WITH ASSOCIATED CONVEYOR SYSTEM WITH THREE YEAR'S EXTENDED WARRANTY CUM MAINTENANCE CONTRACT OF THE PROPOSED SYSTEM
AT
CHP/CPP, PIPARWAR
VOLUME – I(Commercial)

TENDER NOTICE NO. : GM(E&M)/Tender/CHP/16/2970 Dated: 05/09/2016

September, 2016

Central Coalfields Ltd.
(A Subsidiary of Coal India Ltd.)
Darbhanga House, Ranchi - 834031 (Jharkhand)

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SECTION-1

TENDER NOTICE

CENTRAL COALFIELDS LTD.

(A SUBSIDIARY OF COAL INDIA LTD.)

DARBHANGA HOUSE, RANCHI
e-TENDER CUM AUCTION NOTICE

NIT No: GM(E&M)/Tender/ CHP/PPR/16/2970 Dated: 05.09.2016

Digitally signed and encrypted e-Tenders are invited under two Part system on the website https://coalindiatenders.gov.infrom the reputed and experienced contractors for the following work:

Description of work	Location	Estimated Value (in crores)	Earnest Money (in rupees)	Period of Completion (in Days)
Design, Supply, Renovation. Commissioning and Testing of existing Rapid Loading System along with associated conveyor system with extended warranty of three years after initial guaranteed/warranty of one year with spares & consumables and maintenance contract from day one of its operation. .(Total warranty 48 months)	CHP/CPP, Piparwar, Dist.: Chatra, Jharkhand	24.90	24,90,700.00	270

Note: The bid documents will be available on the website(s) and can be downloaded by the bidder up to the bid submission end date. There is no Application Fee.

Time Schedule of Tender

SL No	Particulars	Date	Time
1	Tender e-Publication date	06.09.2016	04:00 PM
2	Document download start date	07.09.2016	10:00 AM
3	Document download end date	04.10.2016	11:00 AM
4	Bid Submission start date	07.09.2016	04:00 PM
5	Bid submission end date	04.10.2016	11:00 AM
6	Start date for seeking Clarification on-line	07.09.2016	04:00 PM
7	Last date for seeking Clarification on-line	24.09.2016	05:00 PM
8	Pre-Bid meeting date	Deleted	
9	Tender Opening date	05.10.2016	11:00 AM
10	Reverse bidding start date	05.10.2016	01:00 PM

For detailed qualification requirements, bid security, tender notice & complete Tender documents including terms and conditions of works visit on e-tendering portal https://www.coalindiatenders.gov.in and Tender

Notice shall be available at websites www.centralcoalfields.in , http://www.eprocure.gov.in/cppp/& www.tenders.gov.in. There is no application fee.

In order to submit the Bid, the bidders have to get themselves registered online on the e procurement portal of CIL (https://www.coalindiatenders.gov.in) with valid Digital Signature Certificate(DSC) issued from any agency authorised by Controller of Certifying agency , Govt of India and which can be traced up to the chain of trust to the Root Certificate of CCA. The online Registration of the Bidders on the portal will be free of cost and one time activity only .The registration should be in the name of Bidder where as DSC holder may be Bidder himself or his duly authorised person.

Tender Inviting Authority

Copy to:

1. Director(Tech-Op),Director(Tech-P&P),Director(P),Director(F),CCL
2. TS to CMD,CCL
3. CVO,CCL
4. GM(System)-for uploading the NIT on CCL website and other govt sites.
5. PRO,CCL
6. Genral Manager(F)-A,General Manager(F)-Op.,CCL Hq.
7. Dr.B.P Nilratna, IAS(Retd.),IEM
8. Shri Chaman Kumar,IAS(Retd.).IEM
9. TS to D(T-Op),D(T-P&P),D(P),D(F),CCL
10. CGM'S/GM'S of - Argada/CWS Barkakana/Hazaribag/ Kuju/ Dhori/B&K/ NK/Piparwar/Rajhara/ Rajrappa/ Barka Sayal./MRS Ramgarh/CH Naisarai/Magadh & Amrapali.
11. NOTICE BOARD
12. Tender Committee :
    a)Director(Tech)
    b)General Manager(E&M)/HOD
    c)General Manager(CMC)
    d)General Manager(F)/HQ.
    e)General Manager,Piparwar Area

CENTRAL COALFIELDS LTD.
(A SUBSIDIARY OF COAL INDIA LTD.)
DARBHANGA HOUSE,RANCHI

DETAILED e-TENDER CUM AUCTION NOTICE

NIT No: GM(E&M)/Tender/ CHP/PPR/16/2970 Dated: 05.09.2016

1. Digitally signed and encrypted e-Tenders are invited under two Part system on the Website https:// www.coalindiatenders.gov.in from the reputed and experienced contractors for the following work:

Description of work	Location	Estimated Value (in crores)	Earnest Money (in rupees)	Period of Completion (in Days)
Design, Supply, Renovation. Commissioning and Testing of existing Rapid Loading System along with associated conveyor system with extended warranty of three years after initial guaranteed/warranty of one year with spares & consumables and maintenance contract from day one of its operation.(Total warranty 48 months)	CHP/CPP. Piparwar Dist.Chatra, Jharkhand	24.90	24,90,700.00	270 Days

Note: The bid documents (detailed qualification requirement , bid security , tender notice and complete tender documents including terms and condition of works) will be available on the website(s) https://www.coalindiatenders.gov.in and Tender Notice shall be available at websites www.centralcoalfields.in / CPP Portal www.eprocure.gov.in & www.tender.gov.in and can be downloaded by the bidder up to the bid submission end date .There is no Application Fee.

In order to submit the Bid, the bidders have to get themselves registered online on the e procurement portal of CIL (https://www.coalindiatenders.gov.in) with valid Digital Signature Certificate(DSC) issued from any agency authorised by Controller of Certifying agency , Govt of India and which can be traced up to the chain of trust to the Root Certificate of CCA. The online Registration of the Bidders on the portal will be free of cost` and one time activity only .The registration should be in the name of Bidder where as DSC holder may be Bidder himself or his duly authorised person.

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2. Deposit of EMD:

The bidder will have to submit EMD through ONLINE only.

2.1. In Online mode the bidder can make payment of EMD either through net-banking from designated Bank/s or through NEFT/RTGS from any scheduled Bank. In case of payment through net-banking the money will be immediately transferred to CCL's designated Account. In case of payment through NEFT/RTGS the bidder will have to make payment as per the Challans generated by system on e-Procurement portal and will have to furnish online the UTR Numbers before submission of bid. Bidder will be allowed to submit his/her bid only when the EMD is successfully received in CCL's designated account and the information flows from Bank to e-Procurement system.

The payment made through NEFT/RTGS must be received in CCL's designated account before the last date and time of receipt of tender. Bidder must upload scanned copy of RTGS/NEFT UTR receipt along with their bid.

2.2 In case of online payment of EMD, if the payment is made by the bidder within the last date & time of bid submission but not received in the CCL Account within the specified period due to any reason then the bid will not be accepted. However, the EMD will be refunded back to the bidder.

2.3 In case of exemption of EMD the scanned copy of document (attested by notary public) in support of exemption will have to be uploaded by the bidder during bid submission.

3. EMD Refund

a. If EMD is paid by the bidder in online mode(Direct Debit/NEFT/RTGS) then EMD of rejected bidders will be refunded at any stage directly to the account from where it had been received (except the bidders whose EMD is to be forfeited). Refund will be made by an automatic process triggered by the online rejection of bids by the system/evaluator. The bidders are advised to make payment from their own account and any claim for non-receipt of the refund in any account other than the one from which payment of EMD is made, will not be entertained.

b. If the refund of EMD is not received by the bidder in the account from which the EMD has been made due to any technical reason then it will be paid through e-payment as per the prevalent manual system.

The bidders should submit MANDATE FORM for e-Payment as per the format given in the bid document.

c. In case the tender is cancelled then EMD of all the participating bidders will be refunded unless it is forfeited by the department.

d. If the bidder withdraws his/her bid online (i.e. before the end date of submission of tender) then his/her EMD will be refunded automatically after the opening of tender.

e. The EMD of successful bidder (on Award of Contract) will be retained by CCL and will be adjusted to Performance Security Deposit.

4. Pre-bid Meeting(deleted): The pre-bid meeting with prospective bidders will be held in the office of Tender Inviting Authority on the scheduled date & time, if specified online. The scope of pre-bid meeting will only be for clarification of doubts regarding tender document.

Non-attendance of pre-bid meeting will not be a cause for disqualification of the bidder and it shall be presumed that the bidder does not require any clarification.

5. The bidders have to accept the on-line user portal agreement which contains the acceptance of all the Terms and Conditions of NIT and Bid document, undertakings and the e-Tendering system throughhttps://www.coalindiatenders.gov.in in order to become an eligible bidder. This will be a part of the agreement.

6.Eligibility Criteria:-

A. Work Experience: The intending bidder must have in its name or proportionate share as a member of joint venture experience of having successfully completed similar works , as a prime contractor during last 7 years ending last day of month previous to the one in which bid applications are invited (i.e. eligibility period) should be any of the following:

i) Three similar completed works each costing not less than the amount equal to 40% of the estimated cost.

Or

ii) Two similar completed works each costing not less than the amount equal to 50% of the estimated cost.

Or

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

The definition of similar works shall be **design, supply, construction and commissioning of rapid loading system including conveyor systems** (consisting of all civil , structural , electrical and mechanical works and all other accessories and facilities required to make it complete in all respects) on turnkey basis.

Note:

*1. The experience towards overseas jobs, if submitted, should be vetted/endorsed by the relevant*embassy/high commission concerned, towards authenticity of document.*
*(*country where the bidder has executed the said work or country of origin of the bidder).*

Joint venture/consortium shall be allowed to participate in the bid.

However, in case of JV/consortium ,exclusive experience of execution /installation and commissioning of RLS or conveyor systems by JV/consortium partners shall be taken into account ; provided that each JV/consortium must have at least one firm having experience of RLS and other firm with experience of conveyor system (irrespective of value of experience of each category) adding up to total experience criteria as specified in NIT

The above qualification criteria shall be fulfilled by JV in the following manner:

The qualifying criteria parameter e.g. experience of the individual partners of the J.V will be as deliberated hereinafter towards fulfilment of qualification criteria related to experience.

a) In case of completion of single work of similar nature costing, not less than the amount equal to 80% of the estimated cost put to tender:-

Any of the JV partner shall have the experience of having completed successfully a single work of similar nature equal to 80% of the estimated cost put to tender.

Or

b) In case of completion of two works of similar nature each costing not less than the amount equal to 50% of the estimated cost put to tender :-

i) Any one partner can match the above requirement.

Or

ii) At least two partners should each have completed at least one work of similar nature each costing not less than the amount equal to 50% of the estimated cost put to tender.

Or

c) In case of completion of three works of similar nature, each costing not less than the amount equal to 40% of the estimated cost put to tender:-

i) Any one partner can match the above requirement.

Or

ii) Any two partners shall match the above requirement through completion of at least one work of similar nature each costing not less than the amount equal 40% of the estimated cost put to tender:-

Or

iii) All the three partners shall match the above requirement through completion of at least one work of similar nature each costing not less than the amount equal 40% of the estimated cost put to tender.

However, during fulfilment of any of the above criteria one of the partner, who is the lead partner shall have :-

a) More than 50 (fifty)% share in J.V.

and

b) Experience of having completed successfully a single work of similar nature equal to at least 40%of estimated cost put to tender.

Experience for those works only shall be considered for evaluation purposes, which match eligibility requirement stipulated above, on or before the last day of month previous to one in which tender has been invited(publication date of NIT). The experience of incomplete/ongoing works as on last date of eligibility period will not be considered for evaluation. If the referred work includes construction as well as maintenance after construction, the experience of such work may be considered as 'acceptable' if the construction part is completed as on the last date of 'eligibility period', even if maintenance work is ongoing, and the certificate issued clearly stipulates the same.

Turnkey completion of works means completion of works by undertaking entire responsibility from concept, design through construction, completion and commissioning.

In all the above cases, while considering the value of completed works, the full value of completed work be considered whether or not the date of commencement is within the said seven years period.

Cost of previous completed works shall be given a simple weightage of 5% per year to bring them at current price level, while evaluating the qualification requirement of the bidder. Such weightage shall be considered after end date of completion. The year can be considered as suitable consecutive 365 day still the last day of month previous to one in which bid has been invited. Updating will be considered for full or part of the year (total no. of days / 365) i.e. considering 365 days in a year, till the last day of month previous to one in which bid has been invited.

In case the bidder is not a prime contractor, but a sub-contractor, the bidder's experience as sub-contractor will be taken into account, against suitable document that the contract in support of qualification is a sub-contract in compliance with the provision of such sub-contracts in the original contract awarded to prime contractor. The document may be issued by owner/Govt. department on behalf of the owner.

Note: In case the bidder is a joint venture, the above information in respect of each individual partner of JV may be furnished and the eligibility experience of JV will be assessed as per pre-defined logic elaborated above.

In case the bidder is a Joint Venture, the work experience of any or all of the individual partners of JV may be furnished to evaluate the work experience of the bidder. In case of JV, if work experience of all the partners are not submitted the system will not disqualify the JV and instead shall consider assuming a value of zero for partner/partners who has/have not submitted the experience value and certificate.

Data to be furnished by the Bidders :

i. Start date & end date of each qualifying experience (similar nature)

ii. Work order Number /Agreement Number of each experience

iii. Name & address of Employer/Work Order Issuing authority of each experience

iv. Percentage (%) share of each experience (100% in case of an Individual/ proprietorship firm or a partner in a partnership firm and the actual % of share in case of a Joint Venture/Consortium).

v. Executed Value of work against each experience

vi. In case the bidder is a Joint Venture, work experience as above may be furnished as the work experience of the bidder.

Technical evaluation of the system

i. The system shall calculate the period of 7 Years backwards starting from last day of month previous to the e-publication date of NIT.

ii. the system shall check the End date of each qualifying experience (The system shall not allow more than 3 entries for experience) and accept it as a qualifying if the end date of experience falls within the 7 years computed by the system.

iii. The system shall calculate the value of each qualifying experience by multiplying the value with the %share of experience and adding 5 % for each completed year (total No. of days/365) after the end date of experience of work till the last date of month previous to one in which the NIT has been published on e-Procurement portal.

iv. The system shall check the experience with highest value whether it exceeds 80 % of ECV .In case it does not, it shall check the top 2 experiences whether each of them is greater than 50 % of ECV . In case ,it still does not , the system shall check all 3 qualifying experiences whether each of them exceeds 40 % of ECV .The system shall regard the bidder as "Eligible" if it meets any of the aforementioned criteria or else it shall consider the bidder as "Ineligible".

v. The weightage of 5 % every year will be on simple rate and will not be compounded on yearly basis for the purpose of calculating the value of each qualifying experience.

vi. The work experience of the bidder for those works only shall be considered for evaluation purposes, which are completed before the last date of month previous to one in which NIT has been published on e-Procurement portal . Hence , the works which are incomplete /ongoing , as on the last date of month previous to one in which NIT has been published on e-Procurement portal, shall not be considered against eligibility.

vii. . In case the work is started prior to the eligibility period of 7 years (counted backwards staring from the last day of month of previous to the e-Publication date of NIT) and completed within the said eligibility period of 7 years , then the full value of work shall be considered against eligibility.

viii. In case the experience has been earned by the bidder as an individual or proprietor of a proprietorship firm or partner of a partnership form , then 100 % value of the experience will be considered against eligibility . But if the experience has been earned by the bidder as a partner in a joint venture firm then the proportionate value of experience in proportion to the actual share of bidder in that joint venture will be considered against eligibility.

Scanned copy of documents to be uploaded by bidders (CONFIRMATORY DOCUMENT) :

For work experience bidders are required to submit Satisfactory Work Completion Certificate issued by the employer against the Experience of similar work containing all the information as sought on-line. In case of Sub-contractor suitable document as per provision of eligibility, if applicable.

Work order , BOQ and/or TDS may be sought during clarification or along with deficient documents as per clause 10.2.B.

B. FINANCIAL TURNOVER

Average annual financial turnover during the last 3 (three) years ending 31st March of the previous financial year should be at least 30% of the estimated cost.

(The "Previous Financial Year" shall be computed with respect to the e-Publication date of NIT).

<u>Data to be furnished by Bidders</u> :

i. Annual turnover of each of the last 3 years ending 31st March of the previous financial year.

ii. Name of the Chartered Accountant issuing the Profit and Loss A/c or the Turnover certificate.

i. Membership Number of the CA

ii. In case the bidder is a Joint Venture, the turnover of the individual partners of the JV will be added together for each financial year and is to be furnished as the turnover of the bidder for that particular financial year

<u>Technical evaluation by the System</u> :

i. The system will calculate the 30 % of the estimated value (ECV) as the required average turnover of the bidder.

ii. The system shall calculate the average of the financial turnover of 3 years furnished by the bidder by adding 5% for each completed year (total number of days/365) after the end of respective Financial Year (i.e. 31st March) till the last day of month previous to one in which e-Tender has been invited.

iii. The average shall be compared with the minimum requirement to ascertain the eligibility status of the bidder.

Iv .If any bidder does not submit the Turnover value for any of the 3 years, the system will not disqualify him and instead shall consider all 3 years for computing the average by assuming a value of 'zero' for the year for which no information is given by bidder.

Scanned copy of documents to be uploaded by bidders (CONFIRMATORY DOCUMENT) :

Turnover certificate issued by a Practicing Chartered Accountant having a membership number with Institute of Chartered Accountants of India containing the information as furnished by bidder on- line.

C. PERMANENT ACCOUNT NO:

The bidder should possess a permanent account number issued by Income tax Department.

Data to be furnished by Bidder on-line :

Confirmation in the form of YES/NO regarding possessing of PAN

Technical evaluation by the System :

The system will evaluate "Yes" as eligible and "No" as not eligible.

Scanned copy of documents to be uploaded by bidders (CONFIRMATORY DOCUMENT) :

PANCARD of the bidder.

(In case of JV, PAN card for each individual partner of JV)

D. VAT/Sales Tax Registration:

The bidder should possess a VAT/ Sales Tax Registration issued by Sales Tax department of any Indian State/UT.

Data to be furnished by Bidder on-line :

Confirmation in the form of YES/NO regarding possessing of VAT/Sales Tax Registration.

Technical evaluation by the System :

The system will evaluate "Yes" as eligible and "No" as not eligible.

Scanned copy of documents to be uploaded by bidders (CONFIRMATORY DOCUMENT) :

VAT/ Sales Tax Registration Certificate.

(In case of JV, VAT/S.T. Registration certificate for each individual partner of JV)

E. Service Tax (Not Applicable for Exempted Services)

The bidder should be either a Small Service Provider and exempted for service tax registration and/or exempted from payment of service tax but a Body Corporate

OR

Small Service Provider and exempted for service tax registration and/or exempted from payment of service tax but not a Body Corporate

OR

A Body Corporate

OR

Other than above three categories

In respect of the above eligibility criteria the bidder is required to furnish the following information online:

i). Confirmation in the form of Yes/No regarding possessing of required document as enlisted in NIT with respect to Service Tax status of the bidder.

Scanned copy of documents to be uploaded by bidders in support of information/ declaration furnished online by the bidder against Eligibility Criteria as Confirmatory Document

Any one of the following documents depending upon the status w.r.to Service Tax as declared by Bidder in the BOQ sheet:

a). Status : Small Service Provider and exempted from Service Tax Registration and/or exempted from payment of Service Tax but a Body Corporate :

Document: 1. A Certificate from a practicing Chartered Accountant having a membership number that the bidder is a Small Service Provider and exempted for Service Tax Registration and/or exempted from payment of Service Tax and

1. The Certificate of Incorporation

b) Status: Small Service Provider and exempted from Service Tax Registration and/or exempted from payment of Service Tax but not a Body Corporate:

Document: A Certificate from a practicing Chartered Accountant having membership number that the bidder is a Small Service Provider and exempted for Service Tax Registration and/or exempted from payment of Service Tax.

c) Status: A Body Corporate:

Document: Service Tax Registration Certificate issued by Central Excise and Custom Department, Govt. of India.

d). Status: Other than above three categories:

Document: Service Tax Registration Certificate issued by Central Excise and Custom Department, Govt. of India.

[In case of JV a Certificate from a practicing Chartered Accountant having membership number *confirming the status of JV w.r.to Service Tax]*

Note: In case the work/service is awarded to a Joint Venture participating in the tender they have to submit VAT, PAN and Service Tax registration (as applicable in the tender and for the bidder status) etc. on the name of the Joint Venture after Award of Work/Service at the time of execution of agreement/ before the payment of first running on account bill.

F. GENERAL ESSENTIAL REQUIREMENTS FOR BOTH SERVICES AND WORKS :

In order to qualify in the tender the bidders have to accept the following conditions:

i. All the Terms and Condition of the NIT and Tender Document Unconditionally on line in the form of User Portal Agreement.

ii. Expected values of each of the General Technical Evaluation(GTE) items

iii. To upload online the scanned copy of documents, as specified in the NIT for evaluation by Tender Committee as per the checklist given in the NIT.

Data to be furnished by Bidder on-line :

i. Confirmation in the form of **Agree/Disagree** for accepting user portal agreement

ii. Confirmation in the form of **Yes/No** for each GTE item

Technical evaluation by the System :

System will capture data in the **Agree/Disagree** OR **YES/NO** format from the bidder and will decide the eligibility for (i) & (ii) above.

For (iii), the confirmatory documents will be downloaded and evaluated by Tender Committee as explained Clause 7 of NIT. The outcome is to be uploaded on line in Confirmatory Document page by Evaluator.

7. SCANNED COPY OF DOCUMENTS TO BE UPLOADED BY BIDDERS (CONFIRMATORY DOCUMENT) :

Sl. No	Eligibility Criteria	Information to be furnished by bidder on line	**Scanned copy of documents, to be uploaded by bidders in support of information/ declaration furnished online by the bidder against Eligibility Criteria as Confirmatory Document**
1.	**THE WORK EXPERIENCE** : The Intending bidder must have in its name or proportionate share as a member of Joint Venture experience of having successfully **completed similar** works, as a prime contractor, during last 7(seven) years ending last day of month previous to the one in which bid applications are invited (i.e. eligibility period) should be any of the following :- Three similar **completed works** each costing not less than the amount equal to 40% of the estimated cost put to tender. Or Two similar **completed works** each costing not less than the amount equal to 50% of the estimated cost put to tender. Or One similar **completed work** costing not less than the amount equal to 80% of the estimated cost put to	1. Start & end date of each qualifying experience (similar nature) 2. Work order/Agreement Number of each experience 3. Work Order Issuing authority of each experience 4. % share of experience (100% in case proprietor or a partner in a partnership firm or the actual % of share in case of a Joint Venture/Consortium). 5. Executed Value of work against each experience	For work experience bidders are required to submit Satisfactory Work Completion Certificate issued by the employer against the Experience of similar work containing all the information as sought on-line. In case of Sub-contractor suitable document as per provision of eligibility, if applicable. (in case of a joint venture, satisfactory work completion Certificate against individual partner(s) including lead partner of the JV applicable as per the details mentioned in Clause 6A). Work order , BOQ and/or TDS may be sought during clarification or along with deficient documents as per clause 10.2.B.

	tender. In case the bidder is not a prime contractor, but a sub-contractor, the bidder's experience as sub-contractor will be taken into account, against suitable document that the contract in support of qualification is a sub-contract in compliance with the provision of such sub-contracts in the original contract awarded to prime contractor. The document may be issued by owner/Govt. department on behalf of the owner.		
2	**FINANCIAL TURNOVER:** Average annual financial turnover during the last 3 (three) years ending 31st March of the previous financial year should be at least 30% of the estimated cost. (The "Previous Financial Year "shall be computed with respect to the e-Publication date of NIT).	1. Annual turnover of the last 3 financial years ending 31st March of the previous financial year. 2. Name of the Chartered Accountant issuing the Profit and Loss A/c or the Turnover certificate. 3.Membership Number of the CA	Financial Turnover certificate for last 3 (three) financial years issued by a Practicing Chartered Accountant having a membership number with Institute of Chartered Accountants of India. *(In case of JV, turnover certificate for each individual partner of JV)*
3	**SERVICE TAX** (Not Applicable for Exempted Services) The bidder should be either a Small Service Provider and exempted for service tax registration and/or exempted from payment of service tax but a Body Corporate	1. Confirmation in the form of Yes/No regarding possessing of required document as enlisted in NIT with respect to Service Tax status of the bidder 2. Status of the bidder in the BOQ excel sheet being uploaded	Any one of the following documents depending upon the status w.r.to Service Tax as declared by Bidder in the BOQ sheet: a). Status : Small Service Provider and exempted from Service Tax Registration and/or exempted from payment of Service Tax but a Body Corporate : Document:1.A Certificate from a practicing Chartered

	OR Small Service Provider and exempted for service tax registration and/or exempted from payment of service tax but not a Body Corporate **OR** A Body Corporate **OR** Other than above three categories	by the bidder during bid submission as per previous column.	Accountant having a membership number that the bidder is a Small Service Provider and exempted for Service Tax Registration and/or exempted from payment of Service Tax and 2.The Certificate of Incorporation b). Status: Small Service Provider and exempted from Service Tax Registration and/or exempted from payment of Service Tax but not a Body Corporate: Document: A Certificate from a practicing Chartered Accountant having membership number that the bidder is a Small Service Provider and exempted for Service Tax Registration and/or exempted from payment of Service Tax. c) Status: A Body Corporate: Document: Service Tax Registration Certificate issued by Central Excise and Custom Department, Govt. of India. d) Status: Other than above three categories: Document: Service Tax Registration Certificate issued by Central Excise and Custom Department, Govt. of India. *[In case of JV* a Certificate from a practicing Chartered Accountant having membership number *confirming the status of JV w.r.to Service Tax]*
4	**LEGAL STATUS OF THE BIDDER**	Confirmation in the form of Yes/NO for possessing the supporting documents	<u>Any one of the following document</u>: 1. Affidavit or any other document to prove proprietorship/**Individual status of the bidder.** 2.Partnership deed containing name of partners 3.Memorandum & Article of Association with certificate of incorporation containing name of

			bidder 4.Joint Venture/consortium agreement containing name of partners and lead partner, Power of Attorney to the Lead Partner and share of each partner.
5	**VALID PERMANENT ACCOUNT NUMBER (PAN)**	Confirmation in the form of Yes/NO for possessing the supporting documents	PAN card issued by Income Tax department, Govt. of India *(In case of JV, PAN card for each individual partner of JV)*
6	**VALID DIGITAL SIGNATURE CERTIFICATE**	Confirmation in the form of Yes/NO for possessing the supporting documents	If the bidder himself is the DSC holder bidding on-line then no document is required . However, if the DSC holder is bidding online on behalf of the bidder then the Power of Attorney for the authority to bid on behalf of the bidder
7	**VALID VAT / SALES TAX REGISTRATION ON WORKS CONTRACT(** Applicable for Works Contract)	Confirmation in the form of Yes/NO for possessing the supporting documents	VAT/Sales Tax Registration Certificate on works contract from any Indian State/UT *(In case of JV, VAT/S.T. Registration certificate for each individual partner of JV)*
8	**VALID ELECTRICAL LICENSE** (For Electrical works only)	Confirmation in the form of Yes/NO for possessing the supporting documents	Valid Electrical Contractor's License issued by Electrical Licensing Board/Authority of any Indian State/UT, in accordance with IE Rule-45. (In case the bidder is a Joint Venture, at least one partner of JV should possess the valid Electrical Contractor's License issued by Electrical Licensing Board/Authority of any Indian state, in accordance with IE Rule-45.)
9	**Integrity pact (if applicable)for estimated cost above 500 lakhs .**	Confirmation in the form of YES/NO for submission of the supporting documents.	Duly signed and witnessed integrity pact as per Performa of bid document .In case of JV undertaking shall be signed by all the partners .
10	**Earnest Money Deposit**	Confirmation in the form of Yes/NO regarding submission of information.	In case of online payment of EMD , bidder should upload a self declaration stating that "EMD has been paid ONLINE through net banking OR NEFT/RTGS."

11	**An undertaking regarding genuineness of the information furnished by him on-line and authenticity of the scanned copy of documents uploaded by him on-line in support of his eligibility.**	Confirmation in the form of Yes/NO for possessing the supporting documents	As per the format given in Chapter 3. **(In case of JV, Undertaking in the Letter Head of JV)**
12	**e- Mandate**		e- Mandate (as per format in bid document) duly signed by bidder with seal and authenticated by bank official with seal.
13	**Scanned copy of additional information as per the format given in chapter 3 .**		
14	**Any other document to support the qualification information as submitted by bidder on-line.**		
	Note: Only one file in .pdf format can be uploaded against each eligibility criteria. Any additional/ other relevant documents to support the information/declaration furnished by bidder online against eligibility criteria may also be attached by the bidder in the same file to be uploaded against respective eligibility criteria.		

8. SUBMISSION OF BID:

8.1 The bidder will submit their bid online. No off-line bid shall be accepted.

8.2 The bidders will have to accept unconditionally the online User Portal Agreement which contains the acceptance of all the Terms and Conditions of NIT including General and Special Terms & Conditions, Integrity Pact and other conditions, if any, along with online undertaking in support of the authenticity of the declarations regarding the facts, figures, information and documents furnished by the Bidder online in order to become an eligible bidder. No conditional bid shall be allowed/accepted. This User Portal Agreement will be a part of NIT/Contract Document.

8.3 In the undertaking given by bidder online, there will be provision for penal action, if any information/declaration furnished online by the bidder against eligibility criteria is found to be wrong at any stage which changes the eligibility status of the bidder.

8.4 For online submission of tender the bidders will have to upload "Letter of Bid", all the confirmatory documents as prescribed in the NIT and TPS(if applicable) in Cover-I and only "Price-bid" in Cover-II. In case of EMD exemption one more document in support of the claim of EMD exemption will have to be uploaded by the bidder in cover I.

i). **Letter of Bid:** The format of Letter of Bid (as given in the NIT) will be downloaded by the bidder and will be printed on Bidder's letter head and the scanned copy of the same will be uploaded during bid submission in cover-I. This will be the covering letter of the bidder for his submitted bid. The content of the "Letter of Bid" uploaded by the bidder must be the same as per the format downloaded from website and it should not contain any other information.

The Letter of bid will be digitally signed by DSC holder submitting bid online and it does not require any physical signature. However, if the Letter of Bid (LOB) bears the physical signature in addition to the digital signature of DSC holder, it will be accepted without questioning the identity of person signing the Letter of Bid.

Note : In case the Bidder participates through JV Route, then the LOB should be on the Letter head of the JV.

ii). **Technical Parameter Sheet(TPS) (If applicable):** The Technical Parameter Sheet containing the technical specification parameters for the tendered work/service will be in Excel format (password protected) and will be uploaded during tender creation. This will be downloaded by the bidder and he will furnish all the required information on this Excel file. Thereafter, the bidder will upload the same Excel file during bid submission in General Technical Evaluation (GTE). The Technical Parameter Sheet which is incomplete and not submitted as per instruction given above will be rejected.

iii). **Confirmatory Documents:** All the confirmatory documents as enlisted in the NIT in support of online information submitted by the bidder are to be uploaded in cover-I by the bidder while submitting his/her bid.

iv) **Price bid:** The Price bid containing the Bill of Quantity will be in Excel format and will be downloaded by the bidder and he will quote the rates for all items on this Excel file. Prior to quoting the rates in the BOQ file, the bidder will select the appropriate status from the following list given in the BOQ:-

I). Small Service Provider and exempted for service tax registration and/or exempted from payment of service tax but a Body Corporate

II) Small Service Provider and exempted for service tax registration and/or exempted from payment of service tax but not a Body Corporate

III). A Body Corporate

IV). other than above three categories

The rates quoted by the bidder will be excluding Service Tax and service tax component (to be paid by CCL and the bidder) will appear as a separate entity. The component of service tax will be taken by the system based on the status of bidder selected by the bidder during bid submission and with the pre defined business logic given in the BOQ file by the department. This file will be digitally signed and uploaded by the bidder.

Thereafter, the bidder will upload the same Excel file during bid submission in cover-Il. The Price-bid (excluding Service Tax) will be in Item Rate BOQ format and the bidder will have to quote for all the tendered items.

System for Decision of L-1 Bidder & Contract Value Calculation:

The L-1 bidder will be decided based on the cost to the Company.

The Price bid will consist of three parts:

(i) For Works and Services excluding Civil and Structural Works:

For calculation of overall Bid value, share of Service Tax required to be paid by the Bidder as well as by the CCL (as per reverse charge mechanism & status of the Bidder effective from 01.07.2012), taken by the system will be ignored excluding Swachh Bharat Cess (SBC) and Krishi Kalyan Cess (KKC) to decide the L1 i.e the ranking of the Bidders will be decided based on rates quoted by the bidders including SBC but excluding Service Tax. This value of the bidder will be "the cost to Company".

Then share of Service Tax to be deposited by the Bidder will be added and share of SBC and KKC to be paid by CCL to be deducted from the overall Bid value to arrive at the Contract value. The Price-bids of the tenderers will have no condition.

(ii) For Civil & Structural Works:

For calculation of overall Bid value, share of Service Tax including Swachh Bharat Cess (SBC) and Krishi Kalyan Cess(KKC) required to be paid by the Bidder as well as by the CCL (as per reverse charge mechanism & status of the Bidder effective from 01.07.2012), taken by the system will be added to decide the L1 i.e the ranking of the Bidders will be decided based on rates quoted by the bidders plus Service Tax including SBC and KKC. This value of the bidder will be "the Cost to the Company".

Then share of Service Tax including SBC and KKC to be deposited by CCL will be deducted to arrive at the Contract value.

(iii) For Supply part :

In case the tendered item is eligible for CENVAT CREDIT then the L-1 status shall be decided by deducting the following price components from the landed price viz Excise Duty, Service Tax (if applicable), Education Cesses for Domestic Bidders from the landed value. In case of Foreign bidders and Domestic Bidders for imported materials Counter Vailing Duty (CVD), Custom Cess & Special Additional Duty (SAD) paid by them during import shall be deducted from the Landed value to decide the L1 Status. This value of the bidder will be "the Cost to the Company".

The Price -bids of the tenderers will have no condition. The Price Bid which is incomplete and not submitted as per instruction given above will be rejected.

L-1 and Contract value are to be decided as follows:

L-1 is summation of the following :

(a) Total rate for **Work and Services excluding Civil and Structural works** minus service tax excluding SBC and KKC for **Work and Services excluding Civil and Structural works** to be paid by the Bidder as well as by the CCL------**(A)**

(b) Total rate for Civil and structural works plus Service Tax including SBC and KKC for Civil and structural works required to be paid by the Bidder as well as by the CCL ----**(B)**

(c) Total rate for Supply part minus total Excise duty, Cesses, CVD, SAD for the Supply part ---**(C)**

For deciding L1 bidder A + B + C (as defined above) will be considered.

Contract Value is summation of following :

(i) A + Share of Service Tax to be deposited by the Bidder for Work and Services excluding Civil and Structural works - Share of SBC and KKC to be deposited by CCL for Work and Services excluding Civil and Structural works

(ii) B - Share of Service Tax including SBC and KKC to be deposited by CCL for Civil and Structural works

(iii) C + Excise duty, Cesses, CVD, SAD for the Supply part.

For deciding the contract value (i) + (ii) + (iii) (as defined above) will be considered

NOTE:(i). A Small Service Provider is one whose aggregate value of taxable service rendered by a provider of taxable service from one or more premises, does not exceed Ten Lakhs Rupees in the preceding financial year.

(ii). Body Corporate i.e. a Company registered under Companies Act, 1956.

(iii)Other than Body Corporate and Small Service Provider not availing exemption of Service Tax i.e. Individual, Proprietorship, Partnership and Joint Venture.

(iv)When L-1 bidder has been awarded the work on the basis of being a Small Service Provider getting exemption from payment of Service Tax (as per status chosen by the bidder), no Service Tax will be reimbursed to them in the event of **bidders total turnover of taxable services from all sources** exceeding the threshold limit of exemption **during the tenure of this contract.**

(v) However, in case of tenders having provision for exemption of EMD, the bidder claiming for exemption will have to upload the requisite document as specified in NIT in support of their claim for exemption of EMD.

8.5 If there is any change in the contents of Letter of Bid uploaded by bidder as compared to the format of Letter of Bid uploaded by the department with NIT document, then the bid will be rejected. However inclusion of any additional redundant information by the Bidder in the submitted Letter of Bid(LOB), which does not contradict the content and spirit of original format of LOB uploaded by department will not be a cause of rejection of his/her bid.

8.6 Modification and withdrawal of Bid : Modification of the submitted bid shall be allowed online only before the deadline of submission of tender and the bidder may modify and resubmit the bid online as many times as he may wish.

Bidders may withdraw their bids online within the end date of bid submission and their EMD will be refunded. However, if the bidder once withdraws his bid, he will not be able to resubmit the bid in that particular tender. For withdrawal of bid after the end date of bid submission, the bidder will have to make a request in writing to the Tender Inviting Authority. Withdrawal of bid may be allowed till issue of work order/LOA with the following provision of penal action:

1.The EMD will be forfeited and

2. The bidder will be debarred for *1(One)* year from participating in tenders in CCL.

The Price-bid of all eligible bidders including this bidder will be opened and action will follow as under:

i). If the bidder withdrawing his bid is other than L 1, the tender process shall go on.

ii). If the bidder withdrawing his bid is L-1, then re-tender will be done.

Note:

In case of above, a letter will be issued to the bidder by Tender Inviting Authority with the approval of Tender Accepting Authority (in case Board is Tender Accepting Authority then with the approval of CMD), stating that the EMD of bidder is forfeited, and this bidder is debarred for one year from participating in tenders in CCL. This letter will be circulated to all Areas and CCL HQ. and the updated list will be maintained by all Tender Inviting Authority/Evaluators..

Penal action against clauses above will be enforced from the date of issue of such order.

iii) The standard operating procedure to handle withdrawal of bid after end date of submission is shall be as follows:

Standard Operative Procedure (SOP) for managing the cases of Withdrawal of Bids in e-Procurement System of CIL/Subsidiary

I. The Mode of Withdrawal:

A. Online Withdrawal of Bids:

a. The system of online withdrawal is available on the portal up to end date of bid submission, where any bidder can withdraw his/her bid which will attract no penal action from department side.

b. The system of online withdrawal beyond end date of bid submission and till award of contract is also available but not fully functional and under development stage. Once it is developed and implemented only online withdrawal shall be considered except for some exceptional cases as mentioned in clause below.

B. Offline Withdrawal of Bids :

a. A partner of bidder(in case of JV and partnership firms) whose DSC is registered on the e-Procurement portal can access the portal for online withdrawal but when there is a split in the business relationship, the partners whose DSC is not registered on the portal do not have the option of online withdrawal of bid. Hence such partners may opt to use

offline method of withdrawal of his/her offer (or express his disassociation from the bidder organization).

b. Till a fully functional system of online withdrawal of bid (beyond end date of bid submission and till award of contract) is not developed and implemented, offline withdrawal shall also be considered.

II. Acceptance of withdrawal by Tender Committee:

A. Every case of withdrawal under Clause I-(A)(b)and Clause I-(B)shall be put up to Tender Committee for deliberation and further course of action.

B. The Tender Committee shall apply its due diligence to decide:

a. Whether the request for withdrawal of offer has been received from right source and authentic. For this purpose a letter is to be sent by registered post/speed post to the bidder on the address as given by him in the enrolment page of e-Procurement portal, allowing 10 days time to confirm the withdrawal. If the bidder does not confirm the withdrawal within the stipulated period then it should be construed that there is no withdrawal of bid. In case the withdrawal/disassociation from the firm (Joint Venture or Partnership firm) has been submitted by any other partner then also the confirmation has to be sought from the bidder and if bidder wants to deny the withdrawal/disassociation from the JV or the partnership firm then the bidder shall be required to furnish a legally acceptable document signed by all the partners of the firm to substantiate his claim.

b. Whether the withdrawal is due to the reason other than to support any mala fide intention of any participating bidder such as participating or supporting a cartel formation etc.

c. If the mala fide intentions in the withdrawal are apprehended then the tender will be cancelled apart from other penal action as per e-Procurement Manual for works and services of CIL and other guidelines/manuals of CIL.

d. If no mala fide intentions in the withdrawal are apprehended then the penal action in line with the prescriptions of the e-Procurement Manual for works and services of CIL will be applicable.

e. The Tender Committee may also obtain the opinion of legal department in order to ascertain the legal course of action in case of Clause II-(B)(b) and II-(B)(c) above.

8.7 Tender Status: It will be the bidder's responsibility to check the status of their Bid online regularly, after the opening of bid till award of contract. Additionally, information shall also be sent by system generated e-mail and SMS at nodal points (Date of bid opening, Requisition for Clarification on Confirmatory document from L-1 bidder, award of work etc.). No separate communication will be required in this regard. Non-receipt of e-mail and SMS will not be accepted as a reason of non-submission of Confirmatory documents within prescribed time. The Tender Status will be in public domain and anyone visiting the site can view it by identifying the tender.

8.8 Extension of Time Schedule of Tender :

If the number of bids received online is less than three on the end date of bid submission then the bid submission end date and bid opening date will be automatically extended by the System, initially for a period of two days and if the number of bids still remains less than three then again for another five days. This extension will be also applicable in case of receipt of zero bids.

After two extensions (as applicable) as stated above the tender shall be opened irrespective of available no. of bids on the extended date of opening of tender. If any of the above extended dates falls on Holiday i.e. a non-working day as defined in the e-procurement portal then the same is to be rescheduled to the next working day.

However, in exceptional cases an extension of end date of Bid submission can be done by issuing corrigendum. Bid opening date will correspondingly be extended.

9. AUTOMATIC EVALUATION(TECHNICAL):

9.1 The e-Procurement System will evaluate the Technical bids automatically on the basis of relevant data provided by bidder through a form in an objective and structured manner while submitting bid. If the parameter given by bidder in objective and structured manner does not confirm to required eligibility criteria as specified in the tender document then the bid will be automatically rejected by the system. The system will automatically upload the technical opening summary and technical evaluation summary.

9.2 Acceptance of Bidder in a general form of online declaration will be recognized and accepted as the certification regarding authenticity of all the information and documents furnished by them online and acceptance of all terms and conditions of the bid document, since such acceptance by Bidder with Digital Signature Certificate is legally tenable.

10.OPENING AND EVALUATION OF TENDER:

10.1 **OPENING OF BID:** Tender (Cover-I and Cover-II) will be decrypted and opened online by the "Bid Openers" with their Digital Signature Certificates on the prescheduled date & time of Tender Opening. After the opening of bid, the system will show lowest rate quoted by bidder(L1). The auction(reverse) will have to be created for tender, with estimated cost as circulated by CCL, after opening of bid.

The **General guidelines and process flow** for Tender Cum Auction are as under:

10.1.1 Reverse Auction will start on pre-scheduled date and time as mentioned in the NIT .

10.1.2 There will be no participation fees for e-Reverse auction.

10.1.3 System displays L1 cost to company price automatically in auction creation form and allows TIA to edit the value as 'start bid' price. **The start Bid Price for Reverse Auction shall be estimated /justified price + 10 % + Max. applicable service tax taking into consideration CENVAT credit ,if applicable or L-1 price whichever is lower if the estimated cost does**

not include Service Tax. For the time being L1 Price or approved estimated price+10%, whichever is lower will be the start bid price for tenders for works and services. The estimated price should be based on SOR (Schedule of Rates) and market analysed rates in case of items/services for which SOR is not available. Wherever SOR is not available, preparation of SOR should be made in a scientific manner based on proper justification on priority. If the L-1 price is higher than the Start Bid Price (Estimated+10%) and the RAP is not triggered within the scheduled time, the cases will be retendered.

10.1.4 The L1 price / start bid price is cost to the company price on which the auction will be initiated. At the end of reverse auction, the L1 bidder has to submit break up of prices conforming to the lowest landed rate quoted by him in the reverse auction.

10.1.5.The bidder(s)who have participated in the reverse auction has to upload the Breakup of cost to company Prices in the confirmatory documents. The detailed Break-up of offered cost to company price, uploaded by the bidder shall be considered and order, if placed, shall be with the same break-up of prices. The bidder(s) after reverse auction will be responsible to ensure that the cost to company rate as per the break-up of prices provided by him after the reverse auction and the cost to company rate offered by him in the reverse auction is exactly same. The bidder will not be allowed to increase the rate of any item while submitting the break up. While giving the break up, the bidder will have to consider same rate of taxes and duties as quoted while submitting the e price bid. In case the bidder(s) fail(s) to submit the break-up of cost to company price within stipulated period or the break up given by bidder does not match with total offered price, the Company will be at liberty to place order proportionately reducing item rates on basis of the breakup of the e-price bid submitted by the bidder along with the initial offer and the same will be binding on the bidder. In case of works and services tenders, the reverse auction will be conducted on the composite cost to company price.

10.1.6 The decrement value will be 0.5 % of the start bid price with minimum of Rs.1/-, as the system does not have a provision of taking amounts less than Rs.1/- as decrement value. The reduction shall have to be made as per decrement value or in multiple thereof.

The maximum seal percentage will be fixed as 2% of start bid price/last quoted price during reverse auction,whichever is lower.

In order to have ease of submission of reverse auction bid by the bidders, it is suggested that decrement value may be rounded off to nearest value as under :

(a) For decrement values up to Rs.10/-, rounding off may be made to nearest rupee.
(b) For decrement values from Rs.11/- to Rs.100/-, rounding off may be made to nearest 10.
(c) For decrement value from Rs.101/- to Rs.1,000/-, rounding off may be made to nearest 100.
(d) For decrement value from Rs.1,001/- to Rs.10,000/-, rounding off may be made to nearest 1000.

and so on .....

For cases where the unit rate is low and quantum of item is huge, if the decrement value in terms of 0.5% works out to be in paise and rounding off to nearest rupee, would be much higher than 0.5%

of start bid value, the unit of measurement may be adjusted in such a way so that decrement value may remain in the range of 0.5% or Rs.1/- whichever is higher.

For example, Tender for any item, whose unit of measurement is in KG and having low unit rate may be invited in terms of 10 KG or 100 Kg, as may be considered appropriate, as unit of measurement.

10.1.7 Initial period of reverse auction will be two hours. There will be auto extensions of time every time by ten minutes in case of any reduction recorded in the last ten minutes. The reverse auction will come to a close only when there is no further reduction recorded in the last ten minutes slot.

10.1.8 System protects bid and bidder information till auction gets over and displays current L1 price to the bidder in auction hall.

10.1.9 System provides bidder details along with bid documents at the end of reverse auction process.

10.1.10 The log details of the entire reverse auction process will be generated by the system once the process of reverse auction is completed.

10.1.11 If a bidder does not submit his bid in the Reverse Auction, the price quoted by him in the price bid shall be considered as the valid price of that bidder. The status of the bidder (L1, L2 etc) shall be evaluated considering either the bid price submitted in Reverse auction or the Price quoted in the price bid, whichever is lower.

10.1.12 Since, reverse auction is a sequel to e-tender, the process of finalizing the tender upon completion of reverse auction will be same as the tender process without reverse auction.

10.1.13 The bid history shall reflect only the landed price. The landed price shall also not be same for two bidders even if any bidder makes such an attempt.

10.1.14 Only the chronologically last bid submitted by the bidder till the end of the auction shall be considered as the valid price bid of that bidder. Any bid submitted earlier by the bidder prior to submission of his last bid will not be considered as the valid price bid.

10.1.15 Server time shall be the basis of Start time & Closing time for bidding and shall be binding for all. This would be visible to all concerned.

10.1.16 On expiry of the closing of the auction, the bid history showing all the last valid bids offered along with name of the bidders shall be published. All bidders shall have the facility to see and get a print of the same for their record.

10.1.17 All electronic bids submitted during the reverse auction process shall be legally binding on the bidder. The chronologically last bid submitted by the bidder till the end of the auction will be considered as the valid price bid offered by that bidder and acceptance of the same by CCL will form a binding contract between CCL and the bidder for entering into a contract.

10.1.18 Conditional discounts shall not be considered. If a bidder offers a discount unilaterally after submission of bid, the discount shall not be considered for evaluation of offers but shall be availed if order is placed on such .

10.1.19 If the lowest price received during reverse auction is unreasonable or it is unacceptable on ground of being too high or too low compared with estimated price, the management reserves right to seek justification of the price from lowest bidder. If the price is not considered reasonable, management may not accept such bid and go for another tender process.

10.1.20 In case of disruption of service at the service provider's end while the RAP is online, due to any technical snag or otherwise attributable to the system failure at the server end, the RAP process will start all over again. In such a situation, the last recorded lowest price of prematurely ended RAP, will be the 'Start Bid' price for the restarted RAP. The prices quoted in the prematurely ended RAP will be binding on all the bidders for consideration, if the restarted RAP does not trigger within the stipulated time.

Disruption and restarting of RAP shall be intimated to all the bidders through system/SMS/e-mail through e procurement portal. All the time stipulations of normal RAP will be applicable to the restarted RAP.

10.2. **TENDER CUM AUCTION EVALUATION:**

A. After opening of Price-bid(after finishing reverse auction in case of tender cum auction), the documents submitted by L-1 bidder in cover I as enlisted in the NIT will be downloaded by the Evaluator and shall be put up to the Tender Committee. The Tender Committee will examine the uploaded documents against information/declarations furnished by the L1 bidder online. If it confirms to all of the information/ declarations furnished by the bidder online and does not change the eligibility status of the bidder then the bidder will be considered eligible for award of Contract.

B. In case the Tender Committee finds that there is some deficiency in uploaded documents by L1 bidder then the same will be specified online by Evaluator clearly indicating the omissions/shortcomings in the uploaded documents and indicating start date and end date allowing 10 days (10 x 24 hours) time for online re-submission by L1 bidder. The L-1 bidder will get this information on their personalized dash board under “Upload confirmatory document” link. Additionally, information shall also be sent by system generated email and SMS, but it will be the bidder’s responsibility to check the updated status/information on their personalized dash board regularly after opening of bid. No separate communication will be required in this regard. Non-receipt of e-mail and SMS will not be accepted as a reason of non-submission of documents within prescribed time. The bidder will upload the scanned copy of all those specified documents in support of the information/ declarations furnished by them online within the specified period of 10

days. If the L1 bidder fails to submit the specified document/s in 10(Ten) days, 10 more days (10 x 24 hours) of time may be given by Evaluator clearly indicating the omissions/shortcomings in the uploaded documents and indicating start date and end date for submission of such document/s.

C. The tender will be evaluated on the basis of documents uploaded by L-1 bidder online. The L-1 bidder is not required to submit hard copy of any document through offline mode. Any document submitted offline will not be given any cognizance in the evaluation of tender.

D. In case the L-1 bidder submits requisite documents online as per NIT, then the bidder will be considered eligible for award of Contract. .

E. In case the L-1 bidder fails to submit requisite documents online as per NIT or if any of the information/declaration furnished by L-1 bidder online is found to be wrong by Tender Committee during evaluation of scanned documents uploaded by bidder, which changes the eligibility status of the bidder,then his bid shall be rejected and **EMD of L-1 bidder will be forfeited**.

F. In case the L1 bidder is technically eligible but rejection is due to high rate quoted by him/her then the tender shall be cancelled and retendered.

G. In case the L1 bidder is rejected due to noncompliance of confirmatory documents then the L-2 bidder will become L-1 bidder and confirmatory documents of this bidder shall be evaluated by TC and the process shall be followed as mentioned in clause no. A to F above.

H. The process as mentioned at Cl. G shall be repeated till the work is either awarded or all the eligible bidders are exhausted.

I. In case none of the bidder complies the technical requirement, then re-tender will be done (with the same or different quantity, as per the instant requirement).

J. It is responsibility of Bidders to upload legible/clearly readable scanned copy of all the required documents as mentioned above.

10.3 The Tender Committee will recommend for award of work to the successful bidder after evaluating their technical eligibility based on the computer generated evaluation sheets followed by evaluation of the scanned documents uploaded by L-1 bidder in support of the information furnished by them online and after evaluation of the reasonableness of L-1 rates. The reasonableness of rates will be evaluated as per the provisions of Manual of CIL and other guidelines issued from time to time.

The approval for award of work to L-1 bidder will be accorded by the competent authority as per Delegation of Power based on the TC recommendation.

10.4 After competent approval and financial concurrence of TCR, the work order to the L-1 bidder will be issued and the scanned copy of the Work Order will be uploaded on the e-Procurement portal and simultaneously the original copy will be sent to the bidder through registered/speed post.

10.5 Any tender hosted on the e-Procurement site must be logically concluded i.e. either Award of work is issued at AOC page on e-Procurement portal in online mode or the tender is cancelled/ retendered online through corrigendum.

10.6 EMD Refund:

a. If EMD is paid by the bidder in online mode (Direct Debit/NEFT/RTGS) then the EMD of rejected bidders will be refunded at any stage directly to the account from where it had been received (except the cases where EMD is to be forfeited).

b. No claim from the bidders will be entertained for non-receipt of the refund in any account other than the one from where the money is received.

c. If the refund of EMD is not received by the bidder in the account from which the EMD has been made due to any technical reason then it will be paid through conventional system of e-payment. For this purpose, if required, Tender Inviting Authority will obtain the Mandate Form from the Bidder.

d. In case the tender is cancelled then EMD of all the participating bidders will be refunded unless it is forfeited by the department.

e. If the bidder withdraws his/her bid online (i.e. before the end date of submission of tender) then his/her EMD will be refunded automatically after the opening of tender.

f. The EMD of successful bidder (on Award of Contract) will be retained by CCL and will be adjusted to Performance Security Deposit.

11. It is the bidder's responsibility to comply with the system requirement i.e. hardware, software and internet connectivity at bidder's premises to access the e-tender portal. Under no circumstances , CCL shall be liable to the bidders for any direct /indirect loss or damage incurred by them arising out of the e-tender system or internet connectivity failures.

12. All the details of technical bid and price bid will be kept preserved in the archives for auditing purposes and the same can be accessed with special authorization. The IP address of all the bidders who has participated in the bid along with timing and date will also be kept preserved in the system.

13. The processes for entering into the agreement with the successful bidder will be done offline as per the prevailing manual system. However, the documents required to be submitted by contractor for executing the agreement will be specified in the Tender document.

14. Bid Validity: The validity of bids shall be not less than 120 (one hundred twenty) days from the Last/end date of submission of bid.

15. The Company reserves the right to postpone the date of receipt and opening of tenders or to cancel the tenders without assigning any reason whatsoever.

16. This Tender Notice shall be deemed to be part of the Contract Agreement**.**

17. The Company does not bind itself to accept the lowest bid and reserves the right to reject any or all the bid without assigning any reasons whatsoever and also to split up the work between two or more tenderers or accept the tender in part and not in its entirety, at its sole discretion.

18. Any addendum/corrigendum/date extension etc. in respect of this tender shall be issued on our Website https://www.coalindiatenders.gov.in only. No separate notification shall be issued in the press. Bidders are therefore requested to visit our website regularly to keep themselves updated.

19. Integrity Pact: Applicable for estimated bid value above Rupees 500 lakhs. The bidder is required to go through the integrity pact which is the part of bid document .The bidder, submitting the bid shall accept the integrity pact as given in the bid document.

Name and address of the Independent External Monitor nominated for this tender:-

Sl. No.	NAME	Address
1	Dr . B.P Nilratna, IAS (Retd.)	D-II/15,Pandara Road, New Delhi-110003
2	Shri Chaman Kumar, IAS(Retd.)	Bungalow No.80 New Motibagh, New Delhi-110023

Tender Inviting Authority

SECTION –2

INSTRUCTIONS TO BIDDERS

SECTION-2
INSTRUCTIONS TO BIDDERS

1.0 SCOPE OF BIDDER

1.1 Central Coalfields Limited (referred to as Employer/ Owner/ invites bids for the construction on turnkey basis for the works (as defined in these documents and referred to as "the works") detailed in the table given in the Notice Inviting Tenders (NIT).

1.2 The successful Bidder will be expected to complete the Works by the Intended Completion period specified in the bid document/notice.

1.3 The total scope of supply and works & services shall be split up into three contracts - one covering The supply part and the second covering the works & services part and third covering the extended warranty with spares and consumables along with maintenance . All the contracts will contain a cross fall breach clause specifying the breach of any one contract will also constitute breach of the other contract and the whole contract combined.

2.0 ELIGIBLE BIDDERS:

2.1 The Invitation for Bid is open to all Bidders including an individual, proprietorship firm, partnership firm, company registered under Companies Act, any legal entity or joint ventures. The bidders shall be eligible to participate only if they fulfill the qualifying/eligibility criteria specified in e-tender Notice and at Clause 3.

2.2 A firm that has been engaged by the Employer to provide consulting services for the preparation or supervision of the Works shall not be eligible to Bid.

2.3 Joint Venture: Two or three companies/ contractors may jointly undertake contract(s). Each entity will be jointly responsible for completing the task as per the contract(applicable to the bids with estimated cost above Rs. 5 Crores.)

Joint Venture Details :-

Name of all partners of a joint Venture (Not more than 3)
1. Lead partner
2. Partner
3. Partner

NOTES : Joint ventures must comply the following requirements :

i) Following are the minimum qualification requirements for Joint Ventures:

a) The qualifying criteria parameter e.g. experience of the individual partners of the J.V with be as deliberated under cl. 6(A) of e Tender Notice towards fulfilment of qualification criteria related to experience.

b) The qualifying criteria parameter e.g. financial resources (turnover and working capital) of the individual partners of the J.V. will be added together, for the relevant period, and the total criteria should not be less than as deliberated under cl.6(B) & 6(C) of e Tender Notice towards fulfilment of qualification criteria related to financial turnover.

ii). The formation of joint venture or change in the Joint Venture character/ partners after submission of the bid and any change in the bidding regarding Joint Venture /will not be

permitted.

iii) The bid, and in case of a successful bid- the agreement, shall be signed so as to legally bind all partners jointly and severally and any bid shall be submitted with a copy of the Joint Venture Agreement providing the joint and several liabilities with respect to the contract.

iv) The pre-qualification of a Joint Venture does not necessarily pre-qualify any of its partners individually or as a partner in any other Joint Venture or association. In case of dissolution of a Joint Venture, each one of the constituent firms may pre-qualify if they meet all the pre-qualification requirements, subject to written approval of the employer.

v) The bid submission must include documentary evidence to the relationship between Joint Venture partners in the form of JV Agreement to legally bind all partners jointly and severally for the proposed agreement which should set out the principles for the constitution, operation, responsibilities regarding work and financial arrangements, participation(percentage share in the total) and liabilities (joint and several) in respect of each and all of the firms in the Joint Venture. Such JV Agreement must evidence the commitment of the parties to bid for the facilities applied for (if pre- qualified) and to execute the contract for the facilities if their bid is successful.

vi) One of the partners shall be nominated for being in charge of the contract and shall be designated as Lead Partner. This authorization shall be evidenced by submitting with the bid a Power of Attorney signed by legally authorized signatories of all the partners.

vii) The JV Agreement must provide that the Lead Partner shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the Joint Venture and the entire execution of the contract shall be done with active participation of the Lead Partner.

viii) The contract agreement should be signed by each Joint Venture Partners. Subsequent declarations/letters/documents shall be signed by lead partner authorized to sign on behalf of the JV or authorized signatory on behalf of JV.

ix) The bid should be signed by all the partners of the Joint Venture.

x) An entity can be a partner in only one Joint Venture. Bid submitted by Joint Venture including the same entity as partner will be rejected.

xi) The JV agreement may specify the share of each individual partner for the purpose of execution of this contract. This is required to full fill eligibility criteria and also for the purpose of apportioning the value of the contract to that extent to individual partner for subsequent submission in other bids if he intends to do so for the purpose of the qualification in that Bid.

xii) The earnest money / bids security bank guarantee can be submitted by the Joint Venture or any partners of the Joint Venture.

xiii) The JV agreement must specifically state that it is valid for the project for which bidding is done. If JV breaks up midway before award of work and during bid validity period bid will be rejected.

If JV breaks up midway before award of work and during bid validity/after award of work/during pendency of contract, in addition to normal penalties as per provision of bid document, all the partners of the JV shall be debarred from participating in future bids for a minimum period of 12 months.

xiv) JV agreement shall be registered in accordance with law so as to be legally valid and binding on the members before making any payment.

xv) JV shall open a bank account in the name of JV and all payments due to the JV shall be

credited by employer to that account only. To facilitate statutory deductions all statutory documents like PAN/TIN etc shall be submitted by JV before making any payment.

2.4 The bidders shall have Digital Signature Certificate (DSC) issued from any agency authorized by Controller of Certifying Authority (CCA), Govt. of India and which can be traced up to the chain of trust to the Root certificate of CCA.

2.5 The bidders have to accept unconditionally the online user portal agreement which contains the acceptance of all the Terms and Conditions of NIT and ITB, including General and Special Terms & Conditions, technical specifications, other conditions, if any, along with on-line undertaking in support of the authenticity of the declarations regarding the facts, figures, information and documents furnished by the bidder on-line in order to become an eligible bidder.

2.6 The company reserves its right to allow Public Enterprises purchase preference facility as admissible under prevailing policy. No sub-letting of the work as a whole by the contractor is permissible. Prior permission is required to be taken from the principle employer for engagement of sub-contractors in part work/piece rated work.

3.0 QUALIFICATION OF THE BIDDER

3.1 In the event that pre-qualification of potential bidders has been undertaken only bids from pre-qualified bidders will be considered for award of contract.

3.2 If the employer has not undertaken pre-qualification of potential bidders, all bidder shall fulfil the eligibility/qualifying criteria as detailed at point. 6 & 7 of e-tender Notice. In addition the bidder shall also fulfil technical requirements to make them eligible for award of contract. Such detail shall be submitted as deliberated at e-tender Notice.

3.3 If the bidder is subsidiary of a company, the experience and resources of the holding company or it's other subsidiaries will not be taken into account. However, if the bidder is holding company the experience and resources of it's wholly owned subsidiaries will be taken into consideration.

3.4 Even though the bidders meet the above eligibility/qualifying criteria, they are subject to be rejected if they have:

a. made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirement; and/or

b. Record of poor performance such as abandoning the works, non-properly completing the contract, inordinate delays in completion, or financial failures etc.

4.0 ONE BID PER BIDDER

Each Bidder shall submit only one Bid, either individually, or as a partner in a partnership firm or a partner in a joint-venture or a public/ private limited firm or any legal entity. A Bidder who submits or participates in more than one Bid (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the Bidder's participation to be disqualified.

5.0 COST OF BIDDING

The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible or liable for those costs.

6.0 SITE VISIT

6.1 The Bidder, at the Bidder's own responsibility, cost and risk, is encouraged to visit and examine the Site of Works and its surroundings, approach road, soil condition, investigation report, existing works if any connected to the tendered work, drawings connected to the work if/ as available and obtain all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.

6.2 It shall be deemed that the Bidder has visited the site/area and got fully acquainted with the working conditions and other prevalent conditions and fluctuations thereto whether he actually visits the site/area or not and has taken all the factors into account while quoting his rates and prices.

6.3 Site Investigation Reports: The Contractor, in preparing the bid, shall rely on the Site Investigation Report referred to in the contract data, supplemented by any information available to the Bidder

6.4 The bidder is expected, before quoting his rate, to go through the requirement of materials, workmanship, specification and conditions of contract.

7.0 CONTENT OF TENDER DOCUMENT

The set of bidding document comprises the documents(all or as available/applicable) listed below:

i) e-Tender Notice
ii) Instruction to Bidders
iii) Letter of Bid
iv) Undertaking
v) Conditions of Contract(General Terms & Conditions, Special Terms & Conditions, Special notes and Additional Terms & Conditions , Safety codes etc.)
vi) Integrity Pact, if applicable
vii) Various Forms
viii) Bill of Quantities and technical specifications
ix) e-tender user portal agreement.

8.0 CLARIFICATION OF BIDDING DOCUMENTS

8.1 The bidder may seek clarification online within the specified period. The identity of the Bidder will not be disclosed by the system. The department will clarify as far as possible the relevant queries of bidders. The clarifications given by department will be visible to all the bidders intending to participate in that tender. The clarifications may be asked from the day of e-Publication of NIT. The period for seeking clarification by bidder will be up to 7 (seven) days before the end date of bid submission. The replies to clarifications sought by bidders will be given by the department at least 2 (two) days before the end date of bid submission.

The Tender Inviting Authority will be responsible for replying/responding to the clarifications online within the prescribed time frame. However, if the Tender Inviting Authority feels that the query is of such a nature that advice of tender committee or any other authority is required to give clarification, he may do so to reply the queries within the prescribed time limit. The queries of bidders clarified online and also unanswered queries of bidders shall be referred in the TCR.

9.0 CORRIGENDUM TO NIT

Corrigendum will be issued only in exceptional cases. Pre-ponement of date for any event is not permitted. Issue of Corrigendum shall be guided by circular of CVO CIL vide reference CIL/VIG/2015/33011/01/526 Dated 11.06.2015(available at CIL website under circulars).

If date of submission of tender is to be extended, then the last date of submission of the tender should be suitably extended with reasonable extension of time and to be notified well in advance to allow the intending s adequate/reasonable time period for submission of their tender offers within the notified extended time period.

In case of extension of Bid Submission, the minimum period of extension shall be of ten days.

The maximum extension of period shall be limited as follows:

With the approval of	Maximum Extension w.e.f original end date of bid submission
Tender Inviting Authority	10 to 15 days
Concerned Director	Up to 30 days

However, in exceptional situations in case of any disruption of service in e-Procurement portal infrastructure or EMD payment infrastructure, for a considerable period, an extension of end date of Bid submission for a period of 1-3 working days may be done after normal resumption of services. Bid opening date will correspondingly be extended. This extension shall be affected by Application Administrator or by the Portal Service Provider for all the tenders who are affected or likely to be affected due to such disruption of services/infrastructure

The Corrigendum Notice will be published in e-procurement portal only .

10.0 LANGUAGE OF BID

All documents relating to the Bid shall be in the English language.

11.0 BID PRICES

11.1 The bidder shall closely study all specification in detail and scope of work which govern the rates he is quoting. The contract shall be for the whole Works as described in Sub-Clause 1.1, based on the scope of work as detailed in the bidding document.

11.2 The Bidder shall submit rates and prices for all items of the Works described in the scope of works.

11.3 All duties, taxes (excluding Service Tax only) and other levies, octroi, royalty, building and construction workers cess (as applicable in States) payable by the Contractor under the Contract, or for any other cause as applicable on the last date of submission of Bid, shall be included in the rates, prices and the total Bid Price submitted by the Bidder. All investments,

operating expenses, incidentals, overheads, leads, lifts, carriages, tools and plants etc. as may be attendant upon execution and completion of works shall also be included in therates, prices and total Bid price submitted by the bidder.

However, such duties, taxes, levies etc. which is notified after the last date of submission of Bid and/or any increase over the rate existing on the last date of submission of Bid shall be reimbursed by the company on production of documentary evidence in support of payment actually made to the concerned authorities.

Similarly if there is any decrease in such duties, taxes and levies the same shall become recoverable from the contractor. The details of such duties, taxes and other levies along with rates shall be declared by the bidder in the Price bid.

The item wise rate quoted shall be exclusive of service tax (share of service provider). Service tax (share of service provider) will be paid extra, if payable. Payment of service tax (share of service provider) by the service availer (i.e. CCL),to the service provider would be made only on the latter submitting a Bill/invoice in accordance with the provision of relevant service tax rules. Cenvat credit is to be availed by paying authority as per rule.

Payment/deposit of service tax (share of service provider) is the responsibility of the service provider.

11.4. The rates and prices quoted by the Bidder shall be fixed for the duration of the contract and shall not be subject to variations on any account except to the extent variations allowed as per the conditions of the contract indicated in the bidding document.

11.5 The bidder has to submit a tentative value.

a) Minimum guaranteed Cenvat credit on account of Excise duty.
b) Minimum guaranteed Cenvat Credit on account of Service Tax.
c) Input Tax credit on account of VAT.

12.0 CURRENCIES OF BID AND PAYMENT

The unit rates and prices shall be quoted by the Bidder entirely in Indian Rupees.

13.0 BID VALIDITY

13.1 Bid shall remain valid for a period not less than 120 days after the deadline for bid submission specified in Clause 15. A bid valid for a shorter period shall be rejected by the Employer.

13.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request that the bidder(s) extend the period of validity for a specified additional period. The request and the bidder's response shall be in writing. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid but will be required to extend the validity of his bid security for the period of extension, and in compliance with Clause 14 in all respects.

14.0 BID SECURITY/EARNEST MONEY DEPOSIT

14.1 The bidder shall furnish, as part of his bid, a Bid Security/Earnest Money of the amount as shown in e-tender Notice and in the form as deliberated at Clause 2 of e-tender Notice.

14.2. Any Bid not accompanied by an acceptable Bid Security/EMD shall be rejected by the Employer as non-responsive.

14.3 The Bid Security of the successful Bidder will be discharged when the Bidder has signed the Agreement and furnished the required Performance Security (1st part of Security Deposit).

14.4 The bid security/EMD (submitted in the form of Electronic Fund Transfer) of successful bidder may be retained and adjusted with performance security / security deposit, at bidder's option.

14.5 In case the L-1 bidder fails to submit requisite documents online as per NIT or if any of the information/declaration furnished by L-1 bidder online is found to be wrong by Tender Committee during evaluation of scanned documents uploaded by bidder, which changes the eligibility status of the bidder ,then his bid shall be rejected and **EMD of L-1 bidder will be forfeited**.

14.6 The Bid Security/ EMD deposited with the Employer will not carry any interest

15.0 DEADLINE FOR SUBMISSION OF BIDS

15.1. Bids shall be submitted on line on the web site https://coalindiatenders.gov.in within the date and time specified in the e-tender notice.

15.2. The employer may extend the deadline for submission of bids by issuing a corrigendum in accordance with provisions of e-tender notice/ITB, in which case all rights and obligations of the employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

16.0 SIGNING AND SUBMISSION OF BID

16.1 The contractors bid will be digitally signed by DSC holder submitting bid online and it does not require any physical signature. However, if the Contractor's bid bears the physical signature in addition to the digital signature of DSC holder, it will be accepted without questioning the identity of person singing the bid.

16.2 Submission of bid shall be guided by clause 8 of e-tender notice.

17.0 MODIFICATION AND WITHDRAWAL OF BIDS

17.1 Modification and withdrawal of bid shall be guided by Clause 8.6 of e-tender Notice.

17.2 No bid withdrawal/modifications shall be allowed after end date and time of Bid submission

17.3 Withdrawal of a Bid between the deadline for submission of Bids and the expiration of the period of Bid validity specified in the bid document or as extended pursuant to Clause 8.6 of e-tender notice may result in the forfeiture of the earnest money pursuant to Clause 14.5

18.0 BID OPENING

18.1 All bids are to be submitted on line only at the website https://www.coalindiatenders.gov.in

18.2 After receipt of Earnest Money (Online/off-line), undertaking, Contractor's bid and other details as per provision of bid submission (cl.8 of e-tender notice) before scheduled submission, the Employer will open the bid in the manner as specified under cl.10 of e-tender notice.

19.0 CLARIFICATION OF BIDS

19.1 In case the Tender Committee finds that there is some deficiency in uploaded documents by L1 bidder then the same will be specified online by Evaluator clearly indicating the omissions/shortcomings in the uploaded documents and indicating start date and end date allowing 10 days (10 x 24 hours) time for online re-submission by L1 bidder. The L-1 bidder will get this information on their personalized dash board under "Upload confirmatory document" link. Additionally, information shall also be sent by system generated email and SMS, but it will be the bidder's responsibility to check the updated status/information on their personalized dash board regularly after opening of bid. No separate communication will be required in this regard. Non-receipt of e-mail and SMS will not be accepted as a reason of non-submission of documents within prescribed time. The bidder will upload the scanned copy of all those specified documents in support of the information/ declarations furnished by them online within the specified period of 10 days. If the L1 bidder fails to submit the specified document/s in 10(Ten) days, 10 more days (10 x 24 hours) of time may be given by Evaluator clearly indicating the omissions/shortcomings in the uploaded documents and indicating start date and end date for submission of such document/s.

19.2. No document uploaded by the bidder after closing date and time of submission of Bid will be considered unless otherwise called for during scrutiny /evaluation and shall be against online request only.

20.0 TENDER CUM AUCTION EVALUATION

20.1 After opening of Price-bid (in case of tender)/after finishing reverse auction (in case of tender cum auction) evaluation will be done as per Clause 10.2 of Detailed e-Tender Notice . Relevant clauses of e-NIT may be referred.

20.2 If the Bid of the successful Bidder is seriously unbalanced in relation to the Company's estimate of the cost of work to be performed under the contract, the Employer may require the Bidder to produce detailed price analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the methods and schedule proposed.

21.0 AWARD CRITERIA

21.1 The Tender Committee will recommend for award of work to the successful bidder after evaluating their technical eligibility based on the computer generated evaluation sheets followed by evaluation of the scanned documents uploaded by L-1 bidder in support of the information furnished by them online and after evaluation of the reasonableness of L-1 rates. The reasonableness of rates will be evaluated as per the provisions of Manual of CIL and other guidelines issued from time to time.

The approval for award of work to L-1 bidder will be accorded by the competent authority as per Delegation of Power based on the TC recommendation.

21.2 After competent approval and financial concurrence of TCR, the work order to the L-1 bidder will be issued and the scanned copy of the Work Order will be uploaded on the e-Procurement portal and simultaneously the original copy will be sent to the bidder through registered/speed post.

21.3 Any tender hosted on the e-Procurement site must be logically concluded i.e. either Award of work is issued at AOC page on e-Procurement portal in online mode or the tender is cancelled/ retendered online through corrigendum.

22.0 EMPLOYER'S RIGHT TO ACCEPT ANY BID, NEGOTIATE AND TO REJECT ANY OR ALL BIDS

22.1 Notwithstanding Clause 21, the Employer reserves the right to accept, negotiate or reject any Bid, and to cancel the bidding process and reject all Bids, at any time prior to the award of Contract, without there by incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Employer's action.

23.0 NOTIFICATION OF AWARD AND SIGNING OF AGREEMENT

23.1 The Bidder, whose Bid has been accepted, will be notified of the award by the Employer prior to expiration of the Bid validity period in writing by e-mail and confirmed by registered letter. This letter(hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the Employer will pay the Contractor in consideration of the execution, completion and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called "the Contract Price").

23.2 The notification of award will constitute the formation of the Contract. The works should be completed within the period specified in the NIT from expiry of *30(Thirty)days from the issue of letter of acceptance issued by department or within 7 days of handing over of the site, whichever is later.

23.3 The Agreement will incorporate all agreements between the Employer and the successful Bidder, work programme etc. within 60(sixty) days following the notification of award along with the letter of Acceptance and/ or Work Order issued by department.

In case of failure to submit performance security and enter in to agreement in specified period or extended period, on written request of contractor, if any, the department in addition to other penal measures as per clause 14.5 of ITB shall debar the selected bidder from participating in re-tender. In addition, the department may debar the bidder from participating in future bids for at least 12 months.

23.4 In the bidding process, the cause of rejection of Bid of any bidder should be intimated to non-qualified bidder after the award of the work to the successful one. The Security / Earnest Money shall be refunded to unsuccessful bidders as per provision of Cause-3 of e-tender cum Auction notice.

23.5 The contractor shall enter into and execute contract agreement in the prescribed form. The cost of the stamp papers for the contract agreement shall be borne by the contractor. Two sets of contract document/agreements shall be prepared and signed by both the parties One of the sets shall be stamped "Original" and the other "Duplicate". The duplicate copy will be supplied to the contractor free of cost and the original is to be retained by the company. For any additional copy, additional cost to be charged. All additional copies should be certified by the Engineer-in-Charge.

The contractor shall keep copy of these documents on the site/place of work in proper manner so that these are available for inspection at all reasonable times by the Engineer-in charge, his representatives or any other officials authorized by the company for the purpose.

The contract document shall not be used by the contractor for any purpose other than this contract and the contractor shall ensure that all persons employed for this contract strictly adhere to this and maintain secrecy, as required of such documents.

24.0 PERFORMANCE SECURITY/SECURITY DEPOSIT

24.1 Security Deposit shall consist of two parts;

a. Performance Security to be submitted at award of work and

b. Retention Money to be recovered from running bills.

The security deposit shall bear no interest.

For details refer Cl. 3 of Conditions of Contract (General terms and Conditions)

25.0 EMPLOYMENT OF LABOUR

25.1 Contractors are to employ, to the extent possible (as per policy decision of the company valid from time to time), local project affected people and pay wages not less than the minimum wages as per minimum Wages Act or such other legislations or award of the minimum wage fixed by respective State Govt. or Central Govt. or wages of contract workers engaged in mining activities as notified by CIL from time to time as may be in force. Payment of Provident Fund for the workmen employed by him for the work as per the Laws prevailing under provision of CMPF / EPF and allied scheme valid from time to time shall be the responsibility of bidder. Bidder shall also submit statutory returns.

25.2 The bidder shall comply with statutory requirements of various acts including CL(R&A) Act.

NOTE: In case company decides / circulates separate wages for such works within mine premises , the same may be allowed based on appropriate circular. Clause 25.1 shall stand amended to this extent before notification of bid.

26.0 LEGAL JURISDICTION

26.1 Matter relating to any dispute or difference arising out of this tender and subsequent contract awarded based on the bid shall be subject to the jurisdiction of Ranchi court only.

27.0 DEEMED EXPORTS

27.1 If the bidder has quoted any item/ items under the deemed exports then it will be the responsibility of the Bidder to get all the benefits under deemed exports from the Government. The Company's responsibility shall only be limited to the issuance of required certificates. The quotation of the Bidder will be unconditional and phrases like "Subject to availability of deemed exports benefit" will not find place in it.

28.0 CONSULTANTS NOT TO BID & VICE-VERSA:

28.1 A firm which has been engaged by the Company to provide Goods or Works for a project or any of its affiliates will be barred from providing consultancy services for the same project. Conversely, a firm hired to provide consultancy services for the preparation or implementation of a project and any of its affiliates will be barred from subsequently providing Goods or Works or services related to the initial assignment for the same project.

29.0 SUB-CONTRACTOR/ SUB-VENDOR :

29.1 The contract agreement will specify major items of supply of services for which the contractor proposes to engage Sub-Contractor/ Sub-Vendor. The contractor may from time to time propose any addition or deletion from any such list and will submit the proposals in this regard to the Engineer in Charge/ Designated Officer in Charge for approval well in advance so as not to impede the progress of work. Such approval of the Engineering Charge/ Designated Officer will not relieve the contractor from any of his obligation, duties and responsibilities under the contract.

29.2 If a contractor submits his bid, qualifies and does not get the contract because of his not being the lowest, he will be prohibited from working as a sub-contractor for the contractor who is executing the work.

30.0 e-PAYMENT

The bidders have to furnish the details of their bank A/c Nos. Name and Address of the Bank and Branch Code along with the Bid. Successful bidders/ Bidders are required to submit an Authorization form duly signed for e-payment to them. Enclosed Annexure be filled in and submitted along with the Bid

31.0 Integrity Pact (Applicable for bids with estimated cost exceeding Rs. 5 Crores).

Bidders are required to submit the pre-contract integrity pact duly signed, witnessed and uploaded as per enclosed format along with the bid Part-I/cover-I. This will be signed by the authorized signatory of the bidder(s) with name, designation and seal of the company. Bidders who do not sign the pact shall be disqualified from participation in the Bid process.

32.0 Changes in Firms Constitution to be intimated

Previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the Firm. If previous approval is not obtained the same will be treated as a breach of contract and shall have same consequences due to such breach of contract.

33.0 Miscellaneous.

33.1 The bidders should fill the bid document properly and carefully. They should avoid quoting absurd rates.

33.2 The contractor will have to submit valid H.T. Electrical Contractor's license issued by the electrical licensing board of state of execution or electrical contractor's license issued by any Indian state duly recognized/endorsed by electrical licensing board of state of execution before execution of agreement.

33.3 After opening of the Tender if the company decides to negotiate, the tenderer should be in a position to depute their representative, at short notice, with full authority for negotiation on technical and other matters.

33.4 Throughout the bidding documents, the terms 'bid' and tender and their derivatives are synonymous.

33.5 The processes for entering into the agreement with the successful bidder will be done offline as per the prevailing manual system. However, the documents required to be submitted by contractor for executing the agreement shall be as specified in the bid document.

33.6 Instruction to Bidder shall be a part of contract agreement.

SECTION -3

FORMAT OF BID & Qualification Information

PROFORMA FOR UNDERTAKING FOR GENEUNINESS

PROFORMA FOR LETTER OF BID

E MANDATE

ADDITIONAL INFORMATION

PROFORMA FOR UNDERTAKINGTO BE SUBMITTED BY BIDDER/S (ON BIDDER'S LETTER HEAD)FOR GENUINENESS OF THE INFORMATION FURNISHED ONLINE AND AUTHENTICITY OF THE DOCUMENTS UPLOADED ONLINE IN SUPPORT OF HIS ELIGIBILITY :

FORMAT OF UNDERTAKING

I / We, ..., Proprietor/Partner/Legal Attorney/Director/ Accredited Representative of M/S. ....., solemnly declare that:

1. I/We am/are submitting Bid for the work…….....against NIT No/Tender ID..... Dated…… and I/we offer to execute the work in accordance with all the terms, conditions and provisions of the bid.
2. Myself/Our Partners/Directors don't has/have any relative as employee of.....…….... (Name of the Company).
3. All information furnished by us in respect of fulfillment of eligibility criteria and qualification information of this Bid is complete, correct and true.
4. All copy of documents, credentials and documents submitted along with this Bid are genuine, authentic, true and valid.
5. I/ We hereby authorize department to seek references / clarifications from our Bankers.
6. *I/We have submitted particulars of existing Sales Tax / VAT registration, if applicable. We also undertake that Certificate of Registration with appropriate Sales Tax / VAT Authority where the work will be executed shall be arranged before any payment is made to us.
7. We hereby undertake that we shall register and obtain license from the competent authority under the contract labour (Regulation & Abolition Act) as relevant, if applicable.
8. *I/We hereby confirm that we have registration with CMPF / EPF Authorities. We shall make necessary payments as required under law.
   Or
   *I/We hereby undertake that we shall take appropriate steps for registration as relevant under CMPF / EPF authorities, if applicable. We shall make necessary payments as required under law.
9. *I/We have not been banned or delisted by any Govt., or Quasi Govt. Agencies or PSUs(In case of JV, all partners are covered).
   Or
   *I / We ……..have been banned by the organization named "_____" for a period of…… year/s, effective from ……. to……..…..(in case of JV, name(s) of the JV Partner(s)).
10. If any information and document submitted is found to be false/ incorrect at any time, department may cancel my/our Bid and action as deemed fit may be taken against me/us, including termination of the contract, forfeiture of all dues including Earnest Money and banning/ delisting of our firm and all partners of the firm etc.

* Delete whichever is not applicable.

(The concerned department may specify any other specific undertaking to be taken from the bidder/s while framing the NIT)

PROFORMA FOR LETTER OF BID TO BE UPLOADED BY BIDDER DURING SUBMISSION OF BID ONLINE :

FORMAT OF "Letter of Bid" (for Works & Services Tenders)

LETTER HEAD OF BIDDER (As enrolled on the e-Procurement Portal of CIL)

To,
The Tender Committee
Central Coalfields Limited

Sub. : Letter of Bid for the work " ----------" (to be filled by the department)

Ref. : 1. NIT No.: "----------" (to be filled by the department)

2. Tender Id No. :"----------" (to be filled by the department)

Dear Sir,

This has reference to above referred bid. I/we have read and examined the conditions of contract, Scope of Work, technical specifications, BOQ and other documents carefully.

I /We am/are pleased to submit our bid for the above work. I/We hereby unconditionally accept the bid conditions and bid documents in its entirety for the above work and agree to abide by and fulfill all terms and conditions and specifications as contained in the bid document.

I/we here by submit all the documents as required to meet the eligibility criteria as per provision of the bid notice/document.

I/We hereby confirm that this bid complies with the Bid validity, Bid security and other documents as required by the Bidding documents.

If any information furnished by me/us towards eligibility criteria of this bid is found to be incorrect at any time, penal action as deemed fit may be taken against me/us for which I/We shall have no claim against CIL/Subsidiary.

Until a formal agreement is prepared and executed, this bid and your subsequent Letter of Acceptance/Work Order shall constitute a binding contract between us and Central Coalfields Ltd.

Should this bid be accepted, we agree to furnish Performance Security within 28 days of issue of letter of acceptance and commence the work within 10 days of issue of letter of acceptance. In case of our failure to abide by the said provision Central Coalfields Ltd. shall, without prejudice to any other right or remedy, be at liberty to cancel the letter of acceptance/ award and to forfeit the Earnest Money and also debar us from participating in future tenders for a minimum period 12 months.

(This document is digitally signed by the DSC holder authorised by the bidder and therefore no physical signature is required)

MANDATE FORM FOR ELECTRONIC FUND TRANSFER/INTERNET BANKING PAYMENT.
To

_____

Sub: Authorization for release of payment due from Central Coalfields Limited, Ranchi through Electronic Fund transfer/Internet Banking. (SBI-NET)
Ref: Order No._____ Date _____ and/or Tender/Enquiry/Letter No. _____ Date

(Please fill in the information in CAPITAL LETTERS, Please TICK wherever it is applicable).

1. Name of the Party : _____
2. Address of the Party : _____
_____
City _____PIN Code_____
E- Mail Id _____
Permanent Account Number _____

3. Particulars of Bank:-

Bank Name		Branch Name	
Branch place		Branch City	
PIN Code		Branch Code	
MICR No.			
(9 Digits code number appearing on the MICR Bank of the cheque supplied by the Bank, please attach Xerox copy of a cheque of your Bank for ensuring accuracy of the Bank name, branch name and code number)			
RTGS CODE			
Account Type	Saving	Current	Cash Credit
Account Number (as appearing in the cheque)			

4. Date from which the mandate should be effective.
I hereby declare that the particulars given above are correct and complete. If any transaction is delayed or not effected for reasons of incomplete or incorrect information. I shall not hold Central Coalfields Limited responsible. I also undertake to advise any change in the particulars of my account to facilitate updation of records for purpose of credit of amount through SBI Net.
Place:
Date:

Signature of the party/Authorized Signatory.

Certified that the particulars furnished above are correct as per our records.
Banker's Stamp :
Date :

(Signature of the Authorized official from the Banks)

ADDITIONAL INFORMATION

1.Subcontractors/Consultants and firms proposed to be involved:

(Attach performance credentials including Bio-data of design personnel of Consultant)

Section of work	Approx. value of sub contract	Sub-contractor(Name and Address)	Experience in similar works

2.Details of the major construction equipment to be used for the work :

Sl No	Equipment type and capacity	Make and model	Number

3.Technical resources proposed to be deployed

Position	Name	Total post qualification experience (years)	In similar Works (years)	As Manager or Section Leader of Similar Works (years)
Project Manager Alternative name				
Site engineers of respective discipline Alternative names				
Cost controller Alternative name				
Quality Assurance Engineer Alternative name				
Site supervisors of resp. disc. Alternative names				

Section-4

CONDITIONS OF CONTRACT

SUB-SECTION-4.1

GENERAL TERMS AND CONDITIONS OF CONTRACT

1. DEFINITIONS :-

i. The word "Company"' or "Employer" or "Owner" or "Purchaser" wherever occurs in the conditions, means the Central Coalfields Limited, represented at the headquarters of the Company or his authorized representative or any other officer specially deputed for the purpose.

ii. The word "Principal Employer" or "Engineer" wherever occurs, means the authorized representative or any other officer specially deputed by the Company for the purpose of contract.

iii. The word "Contractor"/"Contractors" or "Manufacturer" wherever occurs means the successful Bidder/Bidders who has/have deposited the necessary Earnest Money and has/have been given written intimation about the acceptance of tender and shall include legal representative of such individual or persons composing a firm or a company or the successors and permitted assignees of such individual, firm or company, as the case may be.

iv. "The Site" shall mean the site of the contract work including land and any building and erections thereon and any other land allotted by the company for contractor's use in the performance of the contract.

v. The term "sub-contractor", as employed herein, includes those having a direct contract with contractor either on piece rate, items rate, time rate or on any other basis and it includes one who furnishes work to a special design according to the plans or specifications of this work but does not include one who merely supplied materials.

vi. "Consulting Engineer"/"Consultant" shall mean any firm or person duly appointed as such from time to time by the owner.

vii. 'Accepting authority' shall mean the management of the company and includes an authorized representative of the company or any other person or body of persons empowered in this behalf by the company.

viii. A 'Day 'shall mean a day of 24 hours from midnight to midnight.

ix. Engineer-in-charge/Designated Officer-in-charge who is of an appropriate seniority will be responsible for supervising and administering the contract, certifying payment due to the contractor, valuing variations to the contract, awarding extension of time and valuing compensation events. Engineer-in-charge/Designated Officer-in-charge may further appoint his representatives i.e. another person/ Project Manager or any other competent person and notify to the contractor who is directly responsible for supervising the work being executed at the site, on his behalf under the Delegation of Powers of the company.

However, overall responsibility, as far as the contract is concerned will be that of the Engineer-in-charge/Designated Officer-in-charge

x. The 'contract' shall mean the notice inviting tender, the tender as accepted by the company and the formal agreement executed between the company and the contractor together with the documents referred to therein including conditions of contract, special conditions, if any, specifications, designs& drawings including those to be submitted during progress of work, scope of work, billing schedule/schedule of quantities with rates and amounts.

xi. The 'works' shall mean and include the furnishing of equipment, labor, and the services in accordance with the contract or parts thereof as the case may be and shall also include all extra or additional, altered or substituted works or any work of emergent nature, which in the opinion of the Engineer-in-charge, become necessary during the progress of the works to obviate any risk or accident or failure or become necessary for security.

xii. "Specification" shall mean the technical specifications forming a part of the contract and such other schedules and drawings as may be mutually agreed upon.

xiii. 'Contract price' shall mean the total sum for which tender is accepted by the company.

xiv. 'Written notice' shall mean a notice or communication in writing and shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an office of the Corporation/Company for whom it is intended, or if delivered at or sent by registered mail to the last business address known to him who gives the notice.

xv. "Letter of Acceptance" of the tender shall mean the official notice issued by the company notifying the contractor that his tender has been accepted.

xvi. "Date of Contract" shall mean the date on which both the parties have signed the contract agreement.

xvii. "Manufacturer's Works' or Contractor's Works" shall mean the place of work used by the Manufacturer, the Contractor, their collaborators or sub-contractors for the performance of the works.

xviii. "Inspector" shall mean the Owner or any person nominated by the Owner from time, to inspect the equipment stores or Works under the contract and/or the duly authorized representative of the owner.

xix. When the words "Approved", "Subject to Approval", "Satisfactory", "Equal to", "Proper" ,"Requested", "As directed", "Where directed", "When directed", "Determined by", "Accepted", "Permitted", or words and phrases of like import are used, the approval, judgment, direction etc. is understood to be function of the Owner/Engineer/Engineer-in-Charge.

xx. "Test of Completion" shall mean such tests as prescribed in the contract to be performed by the contractor before the Works is taken over by the Owner.

xxi. "Start-up" shall mean the time period required to bring the equipment covered under the Contract from an inactive condition , when construction is essentially complete, to the state ready for trial operation. The start-up period shall include preliminary inspection and check out of equipment and supporting sub-systems; initial operation of the complete equipment covered under the Contract to obtain necessary pre-trial operation data, perform calibration and corrective action; shut down inspection and adjustment prior to the trial operation period.

xxii. "Initial operation" shall mean the first integral operation of the complete equipment covered under the contract with sub-systems and supporting equipment in service.

xxiii. "Trial Operation", "Reliability Test", Trial Run", "Complete Test" shall mean the extended period of time after the "Start-up" period. During this trial operation period the unit shall be operated over the full load range. The length of Trial Operation shall be as determined by the Engineer, unless otherwise specified elsewhere in the Contract.

xxiv. "Performance and Guarantee Tests" shall mean all operation checks and tests required to determine and demonstrate capacity, efficiency, and operating characteristics as specified in the contract document.

xxv. "Commercial Operation" shall mean the condition of operation in which the complete equipment covered under the contract is officially declared by the owner to be available for continuous operation at different loads up to and including rated capacity. Such declaration by

the owner however, shall not relieve or prejudice any of the contractor's obligation under this contract.

xxvi. "Final Acceptance" shall mean the owner's written acceptance of the works performed under the contract, after successful completion of performance and guarantee tests.

xxvii. "Guarantee Period/Maintenance Period" shall mean the period during which the contractor shall remain liable for repair or replacement of any defective part of the works performed under the contract.

xxviii."Drawings"/"Plans" shall mean all :

(a) drawings furnished by the owner/consultant as a basis for proposals,

(b) supplementary drawings furnished by the Owner/Consultant to clarify and to define in greater detail the intent of the contract,

(c) Drawings submitted by the contractor with his proposal provided such drawings are acceptable to the Owner/Consultant,

(d) Drawings furnished by the Owner/Consultant to the Contractor during the progress of the work, and

(e) Engineering data and drawings submitted by the Contractor during the progress of the work provided such drawings are acceptable to the Engineer,

xxix. "Codes" shall mean the following, including the latest amendments, and/or replacements, if any :

(a) Standards of Bureau of Indian Standards relevant to the works under the contract and their specifications.

(b) Other Internationally approved Standards and/or rules and regulations touching the subject matter of the contract.

(i) A.S.M.E. Test codes.
(ii) A.I.E.E. Test codes.
(iii) American Society of Materials Testing Codes.
(iv) Indian Electricity Act and Rules and Regulations made there under.
(v) Indian Explosive Act and Rules and Regulations made there under.
(vi) Indian Petroleum Act and Rules and Regulations made there under.
(vii) Indian Mines Act and Rules and Regulations made there under.

(c) Any other laws, rules, regulations and Acts applicable in the country with respect to labour, safety, compensation, insurance etc.

xxx Words importing singular only shall also include the plural and vice-versa where the context so requires.

xxxi Words importing "Person" shall include firms, companies, corporations, and associations or bodies of individuals, whether incorporated or not.

xxxii Terms and expressions, not defined herein, shall have the same meaning as are assigned to them in the Indian Sale of Goods Act, failing that in the Indian Contract Act, and failing that in the General Clauses Act.

xxxiii Commissioning" the plant/project shall mean completion in all respects of construction rendering the plan/project ready for performance test and commercial operation as per xxv.

xxxiv Government Approvals" shall mean all permits, licenses, authorizations, consents, clearances, decrees, waivers, privileges, approvals from and filing with government instrumentalities necessary for the development, construction and operation of the plant/project.

xxxv "Month" shall mean a calendar month according to the Gregorian calendar.

xxxvi "Bank Guarantee" shall mean the Bank Guarantee to be provided by ..... to.....

xxxvii"Prime contractor "shall mean the contractor who has a contract with the owner of the project or job and has the full responsibility of its completion.

xxxviii "Turnkey contract" shall mean a contract in which the contractor takes the entire responsibility of detailed site investigation, planning, design, material procurement, installation, construction and commissioning of the total project i.e. takes the responsibility from concept to commissioning.

2. CONTRACT DOCUMENTS:

The following documents shall constitute the contract documents:

i) Articles of Agreement,
ii) Notice Inviting Tender,
iii) Letter of Acceptance of Tender indicating deviations, if any, from the conditions of contract incorporated in the Tender document issued to the bidder and/or the Bid submitted by the bidder,
iv) Conditions of contract, including general terms and conditions, additional terms and Conditions, technical terms and conditions, erection terms and conditions, special conditions, if any etc. forming part of the Agreement.
v) Specifications, where it is part of Tender Documents,
vi) Scope of works/Bills of quantities/schedule of works/quantities and
vii) Contract Drawings/finalized work programme.

2.1 After acceptance of tender the Contractor shall be deemed to have carefully examined all Contract Documents to his satisfaction. If he shall have any doubt as to the meaning of any portion of the Contract Documents, he shall before signing the Contract, set forth the particulars thereof, and submit them to the Owner in writing in order that such doubt may be removed. The Owner will provide such clarifications as may be necessary in writing to the Contractor. Any information otherwise obtained from the Owner or the Engineer shall not in any way relieve the Contractor of his responsibility to fulfill his obligations under the Contract.

2.2 The Contractor shall enter into a Contract Agreement with the Owner within 60 (sixty) days from the date of 'Acceptance of Tender' or within such extended time as may be granted by the owner. The performance Bank Guarantee for the proper fulfillment of the contract shall be furnished by the contractor in the prescribed form within thirty (30) days of 'Acceptance of tender'. The performance Guarantee shall be as per terms prescribed in clause 24 Instructions to Bidders of this tender.

2.3 The owner, after the issue of the letter of Acceptance of Tender, will send one copy of the final agreement to the contractor for his scrutiny and approval.

2.4 The agreement, unless otherwise agreed to, shall be signed within 60 days of the issue of the letter of Acceptance of tender, at the office of the owner on a date and time to be mutually agreed. The contractor shall provide for signing of the contract, performance guarantee in copies as required, appropriate power of attorney and other requisite materials. In case it is agreed mutually that the contract is to be signed beyond the stipulated time, the bid guarantee submitted with the tender will have to be extended accordingly.

2.5 The agreement will be signed in six originals and the contractor shall be provide d with one signed original and the rest will be retained by the owner. None of these documents shall be used by the contractor for any purpose other than this contract and the contractor shall ensure

that all persons employed for this contract strictly adhere to this and maintain secrecy, as required of such documents.

2.6 The contractor shall provide free of cost to the owner all the engineering data, drawings and descriptive materials submitted with the bid, in at least six (6) copies to form a part of the contract immediately after issue of letter of acceptance.

2.7 Subsequent to signing of the contract, the contractor at his own cost shall provide the owner with at least six (6)true copies of agreement within thirty (30) days after the signing of the contract.

2.8 The contract shall be considered as having come into force from the date of the letter of acceptance of tender issued by the owner.

2.9 The laws applicable to this contract shall be the laws in force in India. The courts of Ranchi shall have exclusive jurisdiction in all matters arising under this contract.

3.0 CONTRACT PERFORMANCE GUARANTEE/SECURITY DEPOSIT :

3.1 Security Deposit shall consist of two parts;

a) Performance Security to be submitted at award of work and

b) Retention Money to be recovered from running bills.

The security deposit shall bear no interest.

3.1.1 Performance Security should be 5% of contract amount and should be submitted by the successful bidder within30 days of issue of LOA in any of the form given below after which bid security/earnest money will be refunded to the contractor.

- A Bank Guarantee in the form given in the bid document from any schedule bank acceptable to the owner. Bank guarantee issued by out station bank shall be operative at their local branch at Ranchi.

-The Earnest Money shall be discharged when the Bidder has signed the Agreement and furnished the required Performance Security/ 1st part of security deposit.

-The bid security deposited may be adjusted against the Performance security (1stpart of security deposit) at bidder's option.

3.1.2 If performance security is provided by the successful bidder in the form of bank guarantee it shall be issued either –

(a) at Bidder's option by a Scheduled Bank as per provisions of cl.3.1.1. The BG shall contain complete postal address, telephone number, fax number and email address of both out station bank issuing the BG as well as its local operating branch.

(b) by a foreign bank located in India and acceptable to the employer.

Failure of the successful bidder to comply with the requirement as above shall constitute sufficient ground for cancellation of the award of work and forfeiture of the bid security/ earnest money.

In addition to the above penal measures, the bidder will not be allowed to participate in the re-tendering process. The bidder may also be debarred from participating in future tenders in the subsidiary for a minimum period of 12 Months.

3.1.3 Retention Money should be deducted at 5% from running bills. Total of performance security and Retention Money should not exceed 10% of contract amount or lesser sum indicated in the bid document. Retention Money may be released against equivalent Bank Guarantee only for values above Rs. 25.0 lakhs

3.2 The Guarantee amount shall be payable to the Employer without any condition whatsoever.

3.3 Performance Security/Retention Money shall be converted into Performance Guarantee on successful completion of work in accordance with contract and upon satisfactory trial operations. Performance security/ Retention Money /security deposit submitted in the form of BG shall be valid for 51 months from the date of issue of LOI/WO.

3.4 The Performance Guarantee shall cover additionally the following guarantees to the Employer:

(a) The successful bidder guarantees the successful and satisfactory operation of the equipment furnished and erected under the contract, as per the specifications and documents,

(b) The successful bidder further guarantees that the equipment provided and installed by him shall be free from all defects in design, material and workmanship and shall upon written notice from the employer fully remedy free of expenses to the Employer such defects as developed under the normal use of the said equipment within the period of guarantee specified in the relevant clause of the Conditions of Contract.

3.5 The Contract Performance Guarantee is intended to secure the performance of the entire Contract. However it is not construed as limiting the damages under clause entitled 'Equipment Performance Guarantee' in section Technical Conditions of Contract and damages stipulated in the other clauses in the bidding documents.

3.6 All Bank Guarantees are to be submitted in the format prescribed by the company in the bid document. Bank Guarantee shall be irrevocable and it shall be from any Scheduled Bank acceptable to the owner. The BG issued by outstation bank shall be operative at its local branch at Ranchi.

3.7 The Company shall be at liberty to deduct/appropriate from the Contract Performance Guarantee/Security Deposit such sums as are due and payable by the contractor to the company as may be determined in terms of the contract, and the amount appropriated from the Contract Performance Guarantee/Security Deposit shall have to be restored by Contractor subsequently.

3.8 The Contract Performance Guarantee will be returned to the Contractor without any interest at the end of the Guarantee Period as per provisions of the contract. Any defect/defects in the work, if detected during guarantee period shall be rectified to the satisfaction of the Engineer-in- Charge within the said guarantee period or its due extension till completion of the rectification works as required.

3.9 Failure of the successful Bidder to comply with the requirements of Sub- Clause 3.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security. In addition to the above penal measures, the bidder will not be allowed to participate in the re-tendering process. The bidder may also be debarred from participating in future tenders in the subsidiary for a minimum period of 12 Months.

4.0 ASSIGNMENT AND SUBLETTING OF CONTRACT

4.1 The contractor may, after informing the engineer and getting his written approval, assign or sub-let the contract or any part thereof other than for raw materials, for minor detail or any part of the plant for which makes are identified in the contract. Suppliers of the equipment not identified in the contract or any change in the identified supplier shall be subject to approval by the engineer. The experience list of the equipment vendors under consideration by the contractor for this contract shall be furnished to the engineer for approval prior to procurement of all such items/equipments. Such assignment sub-letting shallot relieve the contractor from

any obligation, duty or responsibility under the contract. Any assignment as above without prior written approval of engineer shall be void.

4.2 For components/equipments procured by the contractors for the purposes of the contract, after obtaining the written approval of the owner, the contractor's purchase specifications and enquiries shall call for quality plans to be submitted by the suppliers along with their proposals. The quality plans called for from the vendors shall set out, during the various stages of manufacture and installation, the quality practices and procedures followed by the vendor's quality control organization, the relevant reference documents/standards used, acceptance level, inspection documentation raised, etc. Such quality plans of the successful vendor shall be discussed and finalized in consultation with the engineer and shall form a part of the purchase order/contract between the contractor and the vendor. Within 3 weeks of the release of the same purchase order/contracts for such bought out items/ components, a copy of the same without price details but together with detailed purchase specifications, quality plans and delivery conditions shall be furnished to the engineer by the contractor.

5.0 PATENT RIGHTS AND ROYALTIES

5.1 Royalties and fees for patent covering materials, articles, apparatus, devices, equipment or processes used in the works shall be deemed to have been included in the contract price. The contractor shall satisfy all demands that may be made at any time for such royalties or fees and he alone shall be liable for any damages or claims for patent infringements and shall keep the owner indemnified in that regard. The contractor shall, at his own cost and expense, defend all suits or proceedings that may be instituted for alleged infringement of any patent involved in the works, and, in case of an award of damages, the contractor shall pay for such award. In the event of any suit or other proceedings instituted against the owner, the same shall be defended at the cost and expense of the contractor who shall also satisfy/comply and decree, order or award made against the owner. But it shall be understood that no such machine, plant, work, material or thing has been used by the owner for any purpose or any manner other than that for which they have been furnished and installed by the contractor and specified under these specifications. Final payment to the contractor by the owner will not be made while any such suit or claim remains unsettled. In the event any apparatus or equipment, or any matter thereof furnished by the contractor, is in such suit or proceedings held to constitute infringement, and its use is enjoined, the contractor shall, at his option and at his own expense, either procure for the owner, the right to continue use of said apparatus, equipment or part thereof, replace it with non-infringing apparatus or equipment or modify it, so it becomes non-infringing.

6.0 TIME - THE ESSENCE OF CONTRACT

6.1 The time and the date of completion of the works as stipulated in the contractor's proposal and accepted by the owner without or with modifications, if any and so incorporated in the award letter shall be deemed to be the essence of the contract. The contractor shall so organize his resources and perform his work as to complete it not later than the date agreed to.

6.2 The contractor shall submit a detailed PERT network within the time frame agreed above consisting of adequate number of activities covering various key phases of the works such as design, procurement, manufacturing, shipment and field erection activities within fifteen (15) days after the date of acceptance of tender. This network shall also indicate the interface

facilities to be provided by the owner and the dates by which such facilities are needed. Contractor shall discuss the network so submitted with the owner and the agreed network which may be in the form as submitted or in revised form in line with the outcome of discussions and shall form part of the contract to be signed within sixty (60) days from the date of letter of acceptance of notice of award of contract. During the performance of contract, if in the opinion of the engineer proper progress is not maintained suitable changes shall be made in the contractor's operations to ensure proper progress. For the purpose of this detailed time and progress/ PERT chart, the works shall be deemed to have commenced on the expiry of 30 days from the issue of letter of acceptance or seven days after handing over the site of work, whichever is later.

6.3 The above PERT network shall be reviewed and periodic review reports shall be submitted by the contractor as directed by the engineer.

6.4 Subsequent to the award of the contract, the contractor shall make available to the engineer, a detailed manufacturing programme, in line with the agreed contract network. Such manufacturing programme shall be reviewed, updated and submitted to the Engineer, once every two month thereafter.

7.0 CONTRACT PRICE: The lump sum prices quoted by the contractor in his bid with additions and deletions as may be agreed before signing of the contract, for the entire scope of the work including furnishing and erection of equipment covered under the specifications and documents and shall be treated as the contract price.

8.0 CHANGED QUANTITY: The owner reserves the right to vary the quantities of items or groups of items to be ordered as specified in the accompanying technical specifications, as may be necessary, during the execution of the contract, but such variations unless otherwise specified in the accompanying technical specifications shall be limited to plus or minus twenty percent (20%) of the original quantity ordered.

9.0 DEDUCTIONS FROM CONTRACT PRICE: All costs, damages or expenses which the owner may have paid, for which under the contract the contractor is liable, will be claimed by the owner. All such claims shall be billed by the owner to the contractor regularly as and when they fall due. Such bills shall be supported by appropriate and certified vouchers or explanations, to enable the contractor to properly identify such claims. Such claims shall be paid by the contractor within fifteen (15) days of the receipt of the corresponding bills and if not paid by the contractor within the said period, the owner may then deduct the amount, from any moneys due or becoming due by him to the contractor under the contract or may be recovered by actions of law or otherwise, if the contractor fails to satisfy the owner of such claims.

10.0 CONTRACT PRICE ADJUSTMENT:-

10.1 All adjustments in the contract price shall be computed in accordance with the conditions and formulae prescribed in the relevant clauses of 'Additional Terms and Conditions of Contract', the accompanying technical specifications and further satisfying the requirements specified herein.

10.2 The contract price stated in the contract agreement is the base price. A certain fixed percentage of the base price as indicated in the technical specifications shall not be subject to any price adjustment. The balance percentage viz. the cost portion shall only be subject to price adjustment.

10.3 Price adjustment shall be applicable to the cost portion, only if changes in the cost of labour and materials (either increases or decreases) occur during the contract period, directly affecting the cost portion.

10.4 Variations in the cost of materials shall be determined by comparing published material indices as on the last date of submission of bid (inclusive of price part) or the revised price bid, whichever is later, with the same indices published during the manufacture at the respective cut off periods for material as specified in clause 2.0 of Additional Terms and Conditions of Contract. Variations in the cost of labour shall be determined by comparing the wages as per the Minimum Wages Act/ Rules of the State or Central Government or wages of contract workers engaged in mining activities as notified by CIL from time to time as may be in force., whichever is more, applicable to the place of work as on the last date of submission of bid (inclusive of price part) or the revised price bid, whichever is later, with the same wages as per the Minimum Wages Act/ Rules of the State or Central Government, whichever is more, during the work/manufacture applicable to the place of work/manufacture at the respective cut off periods for labour as specified in clause 2.0 of Additional Terms and Conditions of Contract of this volume

10.5 The total computed variation in the contract price shall be restricted to a limiting percentage as specified in clause 2.5 of Additional Terms and Conditions of Contract of this volume.

10.6 The price adjustment for the erection shall be made on the value of erection work done as indicated in each billing.

10.7 Every three months after the award of contract, and a month prior to shipment of equipment (in the case of ex-factory price component of contract price), and every month after establishing his site office (in the case of erection) the contractor shall submit to the engineer a written notice of the changes, if any, that have occurred in the specified material and labour indices during the previous reporting period containing the effective date of such change, the amount of change, the amount of contract price adjustment and documentary evidence to substantiate the price adjustment.

10.8 The contract price adjustment provisions detailed above, shall only be applicable if so specified in the Additional Terms and Conditions of Contract.

11.0 PACKING, FORWARDING AND SHIPMENT:-

11.1 The contractor, wherever applicable, shall after proper painting, pack and crate all equipment in such a manner as to protect them from deterioration and damage during rail and road transportation to the site and storage at the site till the time of erection. The contractor shall be held responsible for all damages due to improper packing.

11.2 The contractor shall notify the owner of the date of each shipment from his works, and the expected date of arrival at the site for the information of the owner.

11.3 The contractor shall also give all shipping information concerning the weight, size and content of each packing including any other information the owner may require.

11.4 The following documents shall be sent by registered post to the owner within 3 days from the date of shipment, to enable the owner to make progressive payments to the contractor: the payment shall be made only after receipt and acceptance of material at site in good condition.

Application for payment in the standard format of the owner (3 copies),

Invoice (6 copies),
Packing list (6 copies),
Pre-dispatch clearance certificate, if any(3 copies),
Test certificate, wherever applicable (3 copies),

11.5 The contractor shall prepare detailed packing list of all packages and containers, bundles and loose material forming each and every consignment dispatched to site. The contractor shall further be responsible for making all necessary arrangements for loading, unloading and other handling right from his works up to the site and also till the equipment is erected, tested and commissioned. He shall be solely responsible for proper storage and safe custody of all equipment.

12.0 DEMURRAGE, WHARFAGE, ETC: All demurrage, wharf age and other expenses incurred due to delayed clearance of the material or any other reason shall be to the account of the contractor.

13.0 INSURANCE:-

13.1 The contractor shall arrange, secure and maintain insurance as may be necessary and for all such amounts to protect his interests and the interests of the owner, against all risks as detailed herein in the joint names of the Owner and the Contractor with the condition that payments against all claims shall be payable by insurers to the owner as elaborated at clause 13.5. All premiums and other charges of the said insurance policies shall be paid by the contractor. The form and the limit of such insurance, as defined herein together with the under -writer thereof in each case shall be acceptable to the owner. However, irrespective of such acceptance, the responsibility to maintain adequate insurance coverage on comprehensive all risks basis at all time during the period of contract shall be that of the contractor alone. The contractor's failure in this regard shall not relieve him of any of his contractual responsibilities and obligations.

13.2 Any loss of damage to the equipment, during handling, transporting, storage and erection, till such time the plant is taken over by the owner, shall be to the account of the contractor. The contractor shall be responsible for preferring of all claims and make good for the damage or loss by way of repairs and/or replacement of the portion of the works damaged or lost. The transfer of title shall not in any way relieve the contractor of the above responsibilities during the period of the contract. The contractor shall provide the owner with a copy of all insurance policies and documents taken out by him in pursuance of the contract. Such copies of document shall be submitted to the owner immediately after such insurance coverage. The contractor shall also inform the owner in writing at least sixty (60) days in advance, regarding the expiry, cancellation and/or change in any of such documents and ensure revalidation/renewal, etc. as may be necessary well in time.

13.3 The risk that are to be covered under the insurance shall include, but not be limited to, the loss or damage in transit, theft, pilferage, riot, civil commotion, weather conditions, accidents of all kinds, fire, etc. The scope of such insurance shall cover the entire value of the works from time to time.

13.4 All costs on account of insurance liabilities covered under the contract will be on contractor's account and will be included in contract price. However, the owner may from time to time, during the pendency of the contract, ask the contractor in writing to limit the insurance coverage risks and in such a case, the parties to the contract will agree for a mutual settlement for reduction in contract price to the extent of reduced premium amounts.

13.5 All insurance claims, payable by the insurers, shall be paid to the Owner which shall be released to the contractor in installments as may be certified by the Engineer-in-charge for the purpose of rebuilding or replacement or repair of the works and/or goods destroyed or damaged for which payment was received from the insurers.

13.6 The clause entitled insurance under the section erection terms and conditions of contract of this volume, covers the additional insurance requirements for the portion of the works to be performed at the site of work.

14.0 LIABILITY FOR ACCIDENTS AND DAMAGES: Under the contract, the contractor shall be responsible for loss or damage to the plant until the plant is taken over in accordance with clause entitled 'Taking Over' in section technical terms and conditions of contract of this volume .

15.0 LIQUIDATED DAMAGES FOR DELAY IN COMPLETION:-

15.1 If the contractor fails to maintain the required progress in terms of the agreed time and progress chart or to complete the work and clear the site on or before the date of completion of contract or extended date of completion, he shall without prejudice to any other right or remedy available under the law to the company on account of such breach, pay as compensation/ Liquidated Damages @ half percent (1/2%) of the contract price per week of delay. The aggregate of such compensation/ compensations shall not exceed 10 (ten) percent of the total value as shown in the contract. This will also apply to items or group of items for which separate period of completion has been specified. The amount of compensation may be adjusted or set off against any sum payable to the contractor under this or any other contract with the company.

15.2 The company, if satisfied, that the works can be completed by the contractor within a reasonable time after the specified time of completion, may allow further extension of time at its discretion with or without the levy of L.D. In the event of extension granted being with L.D, the company will be entitled without prejudice to any other right or remedy available in that behalf, to recover from the contractor as agreed damages equivalent to half percent of the contract value of the works for each week or part of the week subject to a ceiling of 10% of the contract price.

15.3 The company, if not satisfied that the works can be completed by the contractor, and in the event of failure on the part of the contractor to complete work within further extension of time allowed as aforesaid, shall be entitled, without prejudice to any other right, or remedy available in that behalf, to rescind the contract.

15.4 The company, if not satisfied with the progress of the contract and in the event of failure of the contractor to recoup the delays in the mutually agreed time frame, shall be entitled to terminate the contract.

15.5 In the event of such termination of the contract as described in clauses 15.2 or 15..3 or both, the company, shall be entitled to recover L.D. up to ten percent (10%) of the contract value and forfeit the security deposit made by the contractor besides getting the work completed by other means at the risk and cost of the contractor.

15.6 The company may waive the payment of compensation, depending upon merit of the case, on request received from the contractor if the entire work is completed within the date as specified in the contract or as validly extended without stipulating any penalty.

16.0 CONTRACTOR'S DEFAULT:-

16.1 If the contractor shall neglect to execute the works with the diligence and expedition or shall refuse or neglect to comply with any reasonable orders given to him, if writing by the engineer in

connection with the works or shall contravene the provisions of the contract, the owner may give notice in writing to the contractor to make good the failure, neglect or contravention complained of. Should the contractor fail to comply with the notice within thirty (30) days from the date of service thereof, then and in such case the owner shall be at liberty to employ other workmen and forthwith execute such part of the works as the contractor may have neglected to do or if the owner shall think fit, it shall be lawful for him, without prejudice to any other right he may have under the contract, to take the works wholly or in part thereof and in that event the owner shall have free use of all contractor's equipment that may have been at the time on the site in connection with the works without being responsible to the contractor for fair wear and tear thereof and to the exclusion of any right of the contractor over the same, and the owner shall be entitled to retain and apply any balance which may otherwise be due on the contract by him to the contractor, or such part thereof as may be necessary, the payment of the cost of executing the said part of the works or of completing the works as the case may be. If the cost of completing the works or executing a part thereof as aforesaid shall exceed the balance due to the contractor, the contractor shall pay such excess. Such payment of excess amount shall be independent of the liquidated damages for delay which the contractor shall have to pay if the completion of works is delayed.

16.2 In addition, such action by the owner as aforesaid shall not relieve the contractor of his liability to pay liquidated damages for delay in completion of works as defined in clause 15.0 of this section

16.3 The termination of the contract under this clause shall not entitle the contractor to reduce the value of the performance bank guarantee nor the time thereof. The performance guarantee shall be valid for the full value and for the full period of the contract including guarantee period.

16.4 The bidding documents will clearly state that, if the contractor fails to complete the work and the orders cancelled, the amount due to him on account of work executed by him, if payable, shall be paid to him only after due recoveries as per the provisions of the contract and that too after alternative arrangements to complete the work has been made.

17.0 FORCE MAJEURE

17.1 Force majeure is herein defined as any cause which is beyond the control of the contractor or the owner as the case may be which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affect the performance of the contract, such as:

(a) Natural phenomena, including but not limited to floods, draughts, earthquakes and epidemics:

(b) Acts of any government, including but not limited to war, declared or undeclared, priorities, quarantines, embargoes,

Provided either party shall within fifteen (15) days from the occurrence of such a cause notify the other in writing of such causes.

17.2 (a) The successful bidder / contractor will advise, in the event of his having resort to this clause by registered letter duly certified by the local chamber of commerce or statutory authorities, the beginning and end of the clause of delay, within fifteen days of the occurrence and cessation of such Force Majeure condition . In the event of delay lasting over two months, if arising out of Force Majeure, the contract may be terminated at the discretion of the company.

(b) For delays arising out of Force Majeure, the bidder/ contractor will not claim extension incompletion date for a period exceeding the period of delay attributable to the causes of Force Majeure and neither company nor the bidder shall be liable to pay extra costs (like increase in rates, remobilization advance, idle charges for labor and machinery etc.) Provided it is mutually established that the Force Majeure conditions did actually exist.

(c) If any of the Force Majeure conditions exists in the place of operation of the bidder even at the time of submission of bid he will categorically specify them in his bid and state whether they have been taken into consideration in their quotations.

17.3 The contractor or the owner shall not be liable for delays in performing his obligations resulting from any force majeure cause as referred to and/or defined above. The date of completion will, subject thereinafter provided, be extended by a reasonable time even though such cause may occur after contractor's performance of his obligations has been delayed for other causes.

18.0 DELAYS BY OWNER OR HIS AUTHORIZED AGENT

18.1 In case the contractor's performance is delayed due to any act of omission on the part of the owner or his authorized agents, then the contractor shall be given due extension of time for the completion of the works, to the extent such omission on the part of the owner has caused delay in the contractor's performance of his work. Regarding reasonableness or otherwise of the extension of time, the decision of the engineer shall be final.

18.2 In addition, the contractor shall be entitled to claim demonstrable and reasonable compensation if such delays have resulted in any increase in the cost of work. The owner shall examine the justification for such a request for claim, and if satisfied, the extent of compensation shall be mutually agreed depending upon the circumstances at the time of such an occurrence

18.3 Any delay in finalization of mutual agreement in regard to any of the contractor's claim/ compensation against any act of omission on the part of the owners or his authorized agents should not result in any work stoppage/ further delay on the part of the contractor.

19.0 EXTENSION OF DATE OF COMPLETION

19.1 On happening of any events causing delay as stated hereinafter, the contractor shall intimate immediately in writing the Engineer-in-charge:

a. due to any reasons defined as Force Majeure.
b. non-availability of stores which are the responsibility of the owner to supply
c. non -availability or breakdown of tools and plant to be made available or made available by the owner
d. delay on the part of the contractors or tradesmen engaged by the owner not forming part of the contract, holding up further progress of the work
e. non-availability of working drawings/work program in time, which are to be made available by the company during progress of the work
f. any other causes which, at the sole discretion of the company is beyond the control of the contractor.

19.2 A "Hindrance Register" shall be maintained by both the Company and the Contractor at site to record the various hindrances, as mentioned above, encountered during the course of execution.

19.3 The contractor may request the company in writing for extension of time within 14 days of happening of such event causing delay stating also, if practicable, the period for which extension is desired. The company may, considering the eligibility of the request, give a fair and reasonable extension of time for completion of the work. Such extension shall be communicated to the contractor in writing by the company through the Engineer-in-charge within 1 month of the date of receipt of such request. The contractor shall however use his best efforts to prevent or make good the delay by putting his endeavors constantly as may be reasonably required of him to the satisfaction of the Engineer-in-charge.

19.4 Provisional extension of time may also be granted by the Engineer -In-charge during the course of execution, on written request for extension of time within 15 (fifteen) days of happening of such events as stated above, reserving the company's right to impose/ waive liquidated damages at the time of granting final extension of time as per contract agreement.

19.5 When the period fixed for the completion of the contract is about to expire, the question of extension of the contract may be considered at the instance of the Contractor or the Company or the both. The extension will have to be by party's agreement, expressed or implied.

19.6 In case the Contractor does not apply for grant of extension of time within 15 (fifteen) days of hindrance occurring in execution of the work and the Company wants to continue with the work beyond the stipulated date of completion for reason of the work having been hindered, the Engineer-in-charge at his sole discretion can grant provisional extension of time even in the absence of application from the Contractor. Such extension of time granted by the Engineer-in-charge is valid provided the Contractor accepts the same either expressly or implied by his actions before and subsequent to the date of completion. Such extension of time shall be without prejudice to Company's right to levy compensation under the relevant clause of contract.

20.0 TERMINATION, SUSPENSION, CANCELLATION & FORECLOSURE OF CONTRACT

20.1 The owner shall, in addition to other remedial steps to be taken as provided in the conditions of contract, be entitled to cancel the contract in full or in part, if the contractor

a. makes default in proceeding with the works with due diligence and continues to do so even after a notice in writing from the Engineer-in-charge, then on the expiry of the period as specified in the notice

or

b. commits default/breach in complying with any of the terms and conditions of the contract and does not remedy it or fails to take effective steps for the remedy to the satisfaction of the Engineer-in-charge, then on the expiry of the period as may be specified by the Engineer-in charge in a notice in writing

or

c. fails to complete the work or items of work with individual dates of completion, on or before the date/dates of completion or as extended by the company, then on the expiry of the period as may be specified by the Engineer-in-charge in a notice in writing or

d. shall offer or give or agree to give any person in the service of the company or to any other person on his behalf any gift or consideration of any kind as an inducement or

reward for act/acts of favor in relation to the obtaining or execution of this or any other contract for the company.

or

e. Shall try to obtain a contract with the company by way of offering tendering or other non-bonafide method of competitive tendering.

or

f. transfers, sublets, assigns the entire work or any portion thereof without the prior approval in writing from the Engineer -in-charge. The Engineer-in-charge may by giving a written notice, cancel the whole contract or portion of it in default.

20.2 The owner shall in such an event give fifteen (15) days notice in writing to the contractor of his decision to do so.

20.3 The contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice, make all reasonable efforts to obtain cancellation of all orders and contracts to the extent they are related to the work terminated and terms satisfactory to the owner, stop all further subcontracting or purchasing activity related to the work terminated, and assist the owner in maintenance, protection, and disposition of the works acquired under the contract by the owner.

20.4 The contract shall stand terminated under the following circumstances unless the owner is satisfied that the legal representatives of the individual contractor or of the proprietor of the proprietary concern and in the case of partnership the surviving partners, are capable of carrying out and completing the contract and the owner shall in any way not be liable to payment of any compensation to the estate of deceased contractor and/or to the surviving partners of the contractor's firm on account of the termination of the contract.:

a. If the contractor being an individual in the case of proprietary concern or in the case of a partnership firm any of its partners is declared insolvent under the provisions of insolvency act for the time being inforce, or makes any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors amounting to proceedings for liquidation or composition under any insolvency act.

b. In the case of the contractor being a company, its affairs are under liquidation either by a resolution passed by the company or by an order of court, not being a voluntary liquidation proceedings for the purpose of amalgamation or reorganization, or a receiver or manager is appointed by the court on the application by the debenture holders of the company, if any.

c. If the contractor shall suffer an execution being levied on his/their goods, estates and allow it to be-continued for a period of 21 days.

d. On the death of the contractor being a proprietary concern or of any of the partners in the case of a partnership concern and the company is not satisfied that the legal representative of the deceased proprietor or the other surviving partners of the partnership concern are capable of carrying out and completing the contract. The decision of the company in this respect shall be final and binding which is to be intimated in writing to the legal representative or to the partnership concern.

20.5 If the contractor is an individual or a proprietary concern and the individual or the proprietor dies and if the contractor is a partnership concern and one of the partners dies, then unless the owner is satisfied that the legal representatives of the individual contractor or of the proprietor of the proprietary concern and in the case of partnership the surviving partners, are capable of carrying out and completing the contract the owner shall be entitled to cancel the contract as to its incomplete part without being in any way liable to payment of any

compensation to the estate of deceased contractor and/or to the surviving partners of the contractor's firm on account of the cancellation of the contract.

The decision of the owner that the legal representatives of the deceased contractor or surviving partners of the contractor's firm cannot carry out and complete the contract shall be final and binding on the parties. In the event of such cancellation the owner shall not hold the estate of the deceased contractor and/or the surviving partners of the estate of the deceased contractor and/or the surviving partners of the contractor's firm liable to damages for not completing the contract.

20.6 On cancellation of the contract or on termination of the contract, the Engineer-in-charge shall have powers

a. to take possession of the site and any materials, constructional plant, implements, stores, etc. thereon.

b. to carry out the incomplete work by any means at the risk of the contractor

c. to determine the amount to be recovered from the contractor for completing the remaining work or in the event the remaining work is not to be completed the loss/damage suffered, if any, by the company after giving credit for the value of the work executed by the contractor up to the time of termination/cancellation less on a/c payments made till date and value of contractor's materials plant, equipment, etc., taken possession of after termination/cancellation.

d. to recover the amount determined as above, if any, from any moneys due to the contractor or any account or under any other contract and in the event of any shortfall, the contractor shall be called upon to pay the same on demand.

The need for determination of the amount of recovery of any extra cost/expenditure or of any loss/damage suffered by the company shall not however arise in the case of termination of the contract for death/demise of the contractor as stated in 20.4(d).

20.7 Suspension of work - The company shall have power to suspend the progress of the work or any part thereof and the Engineer -in-charge may direct the contractor in writing to suspend the work, for such period and in such manner as may be specified therein, on account of any default on the part of the contractor, or for proper execution of the work for reasons other than any default on the part of the contractor, or on ground of safety of the work or part thereof. In the event of suspension for reason other than any default on the part of the contractor, extension of time shall be allowed by the company equal to the period of such suspension. Any necessary and demonstrable costs incurred by the contractor as a result of such suspension of the works will be paid by the owner, provided such costs are substantiated to the satisfaction of the engineer. The owner shall not be responsible for any liabilities if suspension or delay is due to some default on the part of the contractor or his sub-contractor.

The work shall, throughout the stipulated period of contract, be carried out with all due diligence on the part of the contractor. In the event of termination or suspension of the contract, on account of default on the part of the contractor, as narrated hereinbefore, the security deposit and other dues of this work or any other work done under this company shall be forfeited and brought under the absolute disposal of the company provided, that the amount so forfeited shall not exceed 10% of the contract value.

20.8 Foreclosure of contract in full or in part - If at any time after acceptance of the tender, the company decides to abandon or reduce the scope of the work for any reason whatsoever the company, through it Engineer-in-charge, shall give notice in writing to that effect to the

contractor. In the event of abandonment/reduction in the scope of work, the company shall be liable

a. to pay the contractor at the contract rates full amount for works executed and measured at site upto the date of such abandonment/reduction in the work.

b. to pay reasonable amount assessed and certified by the Engineer-in-charge of the expenditure incurred, if any, by the contractor on preliminary works at site. e.g. temporary access roads, temporary construction for labor and staff quarters, office accommodation, storage of materials, water storage tanks and supply for the work including supply to labor/staff quarters, office, etc.

c. to pay for the materials brought to site or to be delivered at site, which the contractor is legally liable to pay, for the purpose of consumption in works carried out or were to be carried out but for the foreclosure, including the cost of purchase and transportation and cost of delivery of such materials. The materials to be taken over by the company should be in good condition and the company may allow at its discretion the contractor to retain the materials in full or part if so desired by him and to be transported by the contractor from site to his place.

d. to take back the materials issued by the company but remaining unused, if any, in the work on the date of abandonment/reduction in the work, at the original issued price less allowance for any deterioration or damage caused while in custody of the contractor

e. to pay for the transportation of tools and plants of the contractor from site to contractor's place or to any other destination, whichever is less.

The contractor shall, if required by the Engineer -in-charge, furnish to him books of accounts, papers, relevant documents as may be necessary to enable the Engineer-in-charge to assess the amount payable in terms of para 20.8 (b), (c) and (e) above, the contractor shall not have any claim for compensation whatsoever either for abandonment or for reduction in the scope of work, other than those as specified above.

21.0 NO WAIVER OF RIGHTS: Neither the inspection by the owner or the engineer or any of their officials, employees or agents nor any order by the owner or the engineer for payment of money or any payment for or acceptance of, the whole or any part of the works by the owner or the engineer, nor any extension of time, nor any possession taken by the engineer shall operate as a waiver of any provision of the contract, or of any power here in reserved to the owner, or any right to damages herein provided, nor shall any waiver of any breach in the contract be held to be a waiver of any other or subsequent breach.

22.0 CERTIFICATE NOT TO AFFECT RIGHT OF OWNER AND LIABILITY OF CONTRACTOR: No interim payment certificate of the engineer, nor any sum paid on account, by the owner, nor any extension of time for execution of the works granted by the engineer shall affect or prejudice the rights of the owner against the contractor or relieve the contractor of his obligations for the due performance of the contract, or be interpreted as approval of the works done or of the equipment furnished and no certificate shall create liability for the owner to pay for alterations, amendments, variations or additional works not ordered, in writing, by the engineer or discharge the liability of the contractor for the payment of damages whether due, ascertained, or certified or not, or any sum against the payment of which he is bound to indemnify the owner, nor shall any

such certificate nor the acceptance by him of any sum paid on account or otherwise affect of prejudice the rights of the contractor against the owner.

23.0 GRAFTS AND COMMISSIONS ETC.

Any graft, commission, gift or advantage given, promised or offered by or on behalf of the contractor or his partner, agent, officers, director, employee or servant or any one of his or their behalf in relation to the obtaining or to the execution of this or any other contract with the owner, shall, in addition to any criminal liability which it may incur, subject the contractor to the cancellation of this and all other contracts and also to payment of any loss or damage to the owner resulting from any cancellation. The owner shall then be entitled to deduct the amount so payable from any moneys otherwise due to the contractor under the contract.

24.0 LANGUAGE AND MEASURES: All documents pertaining to the contract including specifications, schedules notices, correspondence, operating and maintenance instructions, drawings or any other writing shall be written in English language. The metric system of measurement shall be used exclusively in the contract.

25.0 RELEASE OF INFORMATION: The contractor shall not communicate or use in advertising, publicity, sales releases or in any other medium photographs or other reproduction of the works under this contract, or descriptions of the site, dimensions, quantity, quality or other information, concerning the works unless prior written permission has been obtained from the owner.

26.0 CONSTRUCTION OF THE CONTRACT

26.1 Notwithstanding anything stated elsewhere in the bid documents, the contract to be entered into will be treated as a divisible supply and erection contract. The supply portion of the contract will relate to the supply of equipment and materials and the erection portion will relate to the handling at the site, storage, erection, construction, testing, commissioning etc. as defined in the bid documents. The contractor will pay the sales tax for the supply of equipment and materials in accordance with law and the same will be reimbursed by the owner as a part of the total contract price on actual. The sales tax should be included in the total bid price in the proposal and should also be indicated separately.

26.2 In case of divisible supply and erection contract, or where the owner hands over his equipment to the contractor for executing, then the contractor shall at the time of taking delivery of the equipment/ dispatch documents be required to execute an indemnity bond in favour of the owner in the form acceptable to the owner for keeping the equipment in safe custody and to utilize the same exclusively for the purposes of the said contract.

26.3 The contract shall in all respects be construed and governed accordingly to Indian Laws.

26.4 It is clearly understood that the total consideration for the contract (s) has been bro ken up into various components only for the convenience of payment of advance under the contract (s) and for the measurement of deviations or modifications under the contract(s).

27.0 COMPLETION OF CONTRACT: Unless otherwise terminated under the provisions of any other relevant clause, this contract shall be deemed to have been completed at the expiration of the guarantee period as provided for under the clause entitled 'Guarantee' in this section.

28.0 ENFORCEMENT OF TERMS: The failure of either party to enforce at any time of the provisions of this contract or any rights in respect thereto or to exercise any option herein provided, shall in no way be construed to be a waiver of such provisions, rights or options or in any way to affect the validity of the contract. The exercise by either party of any of its rights herein shall not preclude or prejudice either party from exercising the same or any other right it may have hereunder.

29.0 ENGINEER'S DECISION:-

29.1 In respect of all matters which are left to the decision of the engineer including the granting or withholding of the certificates, the engineer shall, if required to do so by the contractor give in writing a decision thereon.

29.2 If in the opinion of the contractor, a decision made by the engineer is not in accordance with the meaning and intent of the contract, the contractor may file with the engineer within fifteen (15) days after receipt of the decision, a written objection to the decision. Failure to file an objection within the allotted time will be considered as acceptance of the engineer's decision and the decision shall become final binding.

29.3 The engineer's decision and the filling of the written objection thereto shall be a condition precedent to the right to any legal proceedings. It is the intent of the agreement that there shall be no delay in the execution of the works and the decision of the engineer as rendered shall be promptly observed.

30.0 CO-OPERATION WITH OTHER CONTRACTORS AND CONSULTING ENGINEERS: The contractor shall agree to co-operate with the owner's other contractors and consulting engineers and freely exchange with them such technical information as is necessary to obtain the most efficient and economical design and to avoid unnecessary duplication of efforts. The engineer shall be provided with three copies of all correspondence addressed by the contractor to other sub-contractors and consulting engineers in respect of such exchange of technical information.

31.0 TRAINING OF OWNER'S PERSONNEL:-

31.1 The contractor shall undertake to train free of cost, engineering personnel selected and sent by the owner at the works of the contractor unless otherwise specified in the technical specifications. The period and the nature of training for the individual personnel shall be agreed upon mutually between the contractor and the owner. These engineering personnel shall be given special training in the shops, where the equipment will be manufactured and/or their collaborator's works and where possible, in any other plant where equipment manufactured by the contractor or his collaborator is under installation or test, to enable those personnel to become familiar with the equipment being furnished by the contractor.

31.2 All traveling and living expenses for the engineering personnel to be trained during the total period of training will be borne by the owner. These engineering personnel while undergoing training shall be responsible to the contractor for discipline.

31.3 In the event of the owner, for any reason, failing to avail of the training facilities, he shall not be entitled for any rebate whatsoever on this account.

32.0 POWER TO VARY OR OMIT WORK:-

32.1 No alterations, amendments, omissions, suspensions or variations of the works (hereinafter referred to as 'Variation') under the contract as detailed in the contract documents, shall be

made by the contractor except as directed in writing by the engineer, but the engineer shall have full power subject to the provision hereinafter contained from time to time during the execution of the contract, by notice in writing, to instruct the contractor to make such variation without prejudice to the contract. The contractor shall carry out such variation and be bound by the same conditions as far as applicable as though the said variation occurred in the contract documents. If any suggested variation would, in the opinion of the contractor, if carried out, prevent him from fulfilling any of his obligations or guarantees under the contract, he shall notify the engineer there of in writing and the engineer shall decide forthwith, whether or not the same shall be carried out and if the engineer confirm his instructions, contractor's obligations and guarantees shall be modified to such an extent as may be mutually agreed. Any agreed difference in cost occasioned by any such variation shall be added to or deducted from the contract price as the case may be.

32.2 In the event of the engineer requiring any variation, such reasonable and proper notice shall be given to the contractor to enable him to work his arrangements accordingly, and in cases where goods or materials are already prepared or any design, drawings of pattern made or work done requires to be altered, a reasonable and agreed sum in respect there of shall be paid to the contractor.

32.3 In any case in which the contractor has received instructions from the engineer as to the requirement of carrying out the altered or additional substituted work which either then or later on, will in the opinion of the contractor, involve a claim for additional payments, the contractor shall immediately and in no case later than thirty (30) days, after receipt of the instructions aforesaid and before carrying out the instructions, advise the engineer to that effect. But the engineer shall not become liable for the payment of any charges in respect of any such variations, unless the instructions for the performance of the same shall be confirmed in writing by the engineer.

32.4 If any variation in the works, results in reduction of contract price, the parties shall, agree, in writing, so to the extent of any change in the price, before in contractor proceeds with the change.

32.5 In all the above cases, in the event of a disagreement as to the reasonableness of the said sum, the decision of the engineer shall prevail.

32.6 Notwithstanding anything stated above in this clause, the engineer shall have the full power to instruct the contractor, in writing, during the execution of the contract, to vary to quantities of the items or groups of items. The contractor shall carry out such variations and be bound by the same conditions, as though the said variations occurred in the contract documents. However, the contract price shall be adjusted at the rates and the prices provided for the original quantities in the contract.

33.0 GUARANTEE: The contractor shall warrant that the equipment will be new and in accordance with the contract documents and be free from defects in material and workmanship for a period of twelve (12) calendar months commencing immediately upon the satisfactory completion of the trial operations. The contractor’s liability shall be limited to the replacement of any defective parts in the equipment of his own manufacture of those of his sub-contractors, under normal use and arising solely form faulty design, materials, and/or workmanship provided always that such defective parts are repairable at the site and are not in the meantime essential in the commercial use of the plant. Such replaced defective parts shall be returned to the contractor unless otherwise arranged. No repairs or replacements shall normally be carried out by the engineer when the plant is

under the supervision of the contractor's supervisory engineers. Further the equipment package as defined in the NIT will be under extended warranty for another 36 months with a total warranty of 48 months inclusive supply of spares & consumables for which the purchaser is ready to purchase spares & consumables as suggested by the bidder.

34.0 REPLACEMENT OF DEFECTIVE PARTS AND MATERIALS:-

34.1 If during the progress of the works the engineer shall decide and inform in writing to the contractor, that the contractor has manufactured any plant or part of the plant unsound or imperfect or has furnished any plant inferior than the quality specified, the contractor on receiving details of such defects or deficiencies shall at his own expense within seven (7) days of his receiving the notice, or otherwise, within such time as may be reasonably necessary for making it good, proceed to alter, re-construct or remove such work and furnish fresh equipment up to the standards of the specifications. In case the contractor fails to do so, the engineer may on giving the contractor seven (7) days' notice in writing of his intentions to do so, proceed to remove the portion of the works so complained of and, at the cost of the contractor, perform all such work or furnish all such equipment provided that nothing in this clause shall be deemed to deprive the owner of or affect any rights under the contract which the owner may otherwise have in respect of such defects and deficiencies.

34.2 The contractor's full and extreme liability under this clause shall be satisfied by the payments to the owner of the extra cost, of such replacement procured, including erection, as provided for in the contract, such extra cost being the ascertained difference between the price paid by the owner for such replacements and the contract price portion for such defective plant and repayments of any sum paid by the owner to the contractor in respect of such defective plant. Should the owner not so replace the defective plant, the contractor's extreme liability under this clause shall be limited to repayment of all sums paid by the owner under the contract for such defective plant.

35.0 DEFENCE OF SUITS: If any action in court is brought against the owner or engineer or an officer or agent of the owner. For the failure or neglect on the part of the contractor to perform any acts, matters, covenants or things under the contract, or for damage or injury caused by the alleged omission or negligence on the part of the contractor, his agents, representatives or his sub-contractors, workmen, suppliers or employees, the contract tor shall in all such cases indemnify and keep the owner, and the engineer and/or his representative, harmless from all losses, damages, expenses or decrees arising of such action.

36.0 LIMITATIONS OF LIABILITIES: The final payment by the owner in pursuance of the contract shall mean, the release of the contractor from all his liabilities under the contract. Such final payment shall be made only at the end of the guarantee period as detailed in clause 33.0 above and till such time as the contractual liabilities and responsibilities of the contractor, shall prevail. All other payments made under the contract shall be treated as on account payments.

37.0 MARGINAL NOTES: The marginal notes to any clause of the contract shall not affect or control the construction of such clause.

38.0 TAXES, PERMITS & LICENCES: The contractor shall be liable and pay all- Indian taxes, (other than service tax) duties, levies, royalties, whether local, municipal, provincial or central lawfully assessed against the owner or the contractor in pursuance of the contract. In addition the

contractor shall be responsible for payment of all Indian duties, levies and taxes lawfully assessed against the contractor for his personal income and property only. This clause shall be read in conjunction with clause 12.3 of Instruction to Bidders.
The contractor, along with his bills, shall submit proper documents in the name of the Company to enable the Company claim Input Tax Credit /CENVAT Credit under the applicable laws. The invoice shall be incompliance with the relevant Central excise rules. CCL is entitled to avail CENVAT credit on account of: Excise Duty for indigenous product. Countervailing duty and special additional duty for imported products. Hence set off allowed against VAT, Excise Duty, Countervailing duty/special additional duty and service tax as per relevant tax act. Contractor shall submit relevant document as desired by CCL at the time of supply, along with the bills for enabling CCL to claim CENVAT benefit.

39.0 PROGRESS REPORTS AND PHOTOGRAPHS: During the various stages of the works in the pursuance of the contract, the contractor shall at his own cost submit periodic progress reports as may be reasonably required by the engineer with such materials as charts, net-works, photographs, test certificates, etc. such progress report shall be in the form and size as may be required by the engineer and shall be submitted in at least three (3) copies.

40.0 LONG TERM AVAILABILITY OF SPARES:-

40.1 The contractor shall guarantee the long term availability of spares to the owner for the full life of the equipments covered under the contract. The contractor shall guarantee that before going out of production of spare parts of the equipment covered under the contract, he shall give the owner at least twelve (12)months advance notice so that the latter may order his bulk requirement of spares, if he so desires. The same provision will also be applicable to sub-contractor. Further, in case of discontinuance of manufacture of any spares by the contractor or his sub-contractors the contractor will provide the owner two years in advance, with full manufacturing drawings, material specifications and technical information required by the owner for the purpose of manufacture of such items.
40.2 Further, in case of discontinuance of supply of spares by the contractor or his sub-contractors the contractor will provide the owner with full information for replacement of such spares with other equivalent makes, if so required by the owner.

40.3 The contractor shall provide the owner with a "directory" of his sub -contractors giving the addresses and other particulars of his sub-contractors. The owner, if he so desires, shall have the right to procure the spares directly from sub -contractors.

40.4 Notwithstanding anything stated elsewhere in the bid documents, the prices of all spares which maybe procured to cover long term requirements beyond the 2 years' maintenance and operational requirements will be generally in accordance with the mutually agreed prices.

40.5 The contractor will indicate in advance the delivery period of the items of spares, which the owner may procure in accordance with the sub-clause 40.4. In case of emergency requirements of spares, the contractor would make every effort to expedite the manufacture and delivery of such spares on the basis of mutually agreed time schedule.

40.6 The procedure specified in clause 40.4 and 40.5 shall apply for future procurement of items included in stand by spare list, mandatory spares lists, optional spares list and special tools, plants and equipment list, if any, specified in the bid documents.

40.7 The Contractor shall indemnify the owner for the availability of long time spares as per the terms and conditions laid down above in clause 40.1 to clause 40.6.

41.0 PAYMENT: The payment to the contractor for the performance of the works under the contract will be made by the owner as per the guidelines and conditions specified herein. All payment made during the contract shall be on account payments only. The final payment will be made on completion of all the works and on fulfillment by the contractor of all his liabilities under the contract.

41.2 CURRENCY OF PAYMENT: All payments under the contract shall be in Indian Rupees only.

41.3 DUE DATES FOR PAYMENT: Owner will make progressive payment as and when the payment is due as per the terms of payment set forth in the accompanying technical specifications. Payment will become due and payable by the owner within thirty 30) days from the date of receipt of contractor's bill/invoice/debit note by the owner, provided the documents submitted are complete in all respects.

41.4 PAYMENT SCHEDULE: The contractor shall prepare and submit to the engineer for approval, a break-up of the contract price. This contract price break-up shall be interlinked with the agreed detailed PERT network of the contractor setting forth his starting and completion dates for the various key phases of works prepared as per condition of this section. While preparing the PERT network, the supply of P&M Equipment shall be linked to construction of respective Civil and Structural Works. Any payment under the contract shall be made only after the contractor's price break-up is approved by the engineer. The aggregate sum of the contractor's price break-up shall be equal to the lump sum contract price

41.5 INTERIM PAYMENTS:-

41.5.1 The contractor shall submit running bill for the payment in the prescribed proforma of the owner to be supplied in due course at the time of payment.

41.5.2 Each such running bill shall state the amount claimed and shall set forth in detail, in the order of the payment schedule, particulars of the works including the works executed at site and of the equipment shipped/brought on to the site pursuant to the contract up to the date mentioned in the bill and for the period covered since the last preceding certificate, if any.

41.5.3 Every interim payment claim shall indicate the contract value of the works executed up to the date mentioned in the running bill, provided that no sum shall be included in any running bill in respect of the works that, according to the decision of the engineer, does not comply with the contract, or has been performed, at the date of certificate prematurely.

41.6 TERMS OF PAYMENTS:-

41.6.1 PAYMENT: Since the total job is on turnkey basis, any payment to the Contractor before the final payment shall be treated as provisional payment towards the total contract value. The Contractor may at intervals of not less than one month submit claims/ bills for payment on account of work done after proper scrutiny and certification of the same by the Employer. The progressive payment shall be made in respect of the following:

a) Design engineering
b) Civil construction including foundation and buildings
c) Structural fabrication and erection
d) Supply of equipment

e) Machinery Erection
f) Trial Run and commissioning
g)After successful trial run and commissioning , the RLS package will be under comprehensive maintenance contract from day one of its operation , the spares required if any shall be provided by the OEM/bidder free of cost as guaranteed replacement for 1st twelve months after words the equipment package as defined on the NIT will be under extended warranty of additional three years and the employer will purchase spares and consumables for the extended three years. The bid will be decided on the total cost of 48 months basis .

All such payments shall be made by the Employer online / through Account Payee Cheque within a month from the date of the submission of claims/bills. Payment will also be governed by Clauses of 3.0 of General Terms& Conditions of Contract. Any sum due from the Contractor shall be deducted from the first or next subsequent on account of payments as the case may be, in general the following procedure of payment shall be followed:

41.6.1.1 DESIGN AND ENGINEERING:-

a) 85 % payment on completion of approval of system, mechanical, electrical, civil, structural design, drawings etc. as per contract on prorate basis.
b) 7.5 % payment on Preliminary acceptance of the works after start-up and trial operation .
c) 7.5% on issue of final acceptance certificate of the works after performance and guarantee test.

41.6.1.2 CIVIL/STRUCTURAL WORKS:-

a) 90 % payment on progress of work completed, duly measured and certified by the engineer.
b) 5 % payment on preliminary acceptance of the works after start-up and trial operation .
c) 5 % on issue of final acceptance certificate of the works after performance and guarantee test.

41.6.1.3 SUPPLY OF EQUIPMENT:-

a) 85 % payment on receipt of the equipment conforming to stipulated specifications and quality in good condition at site to be certified by the site engineer.
b) 7.5% on preliminary acceptance of the works after start-up and trial operation .
c) 7.5% on issue of final acceptance certificate of the works after performance and guarantee test .

41.6.1.4 INSTALLATION & COMMISSIONING:-

a) 85% progress payment based on the installation and commissioning of plant and equipment duly certified by site engineer.
b) 7.5% payment on preliminary acceptance of the works after start-up and trial operation.
c) 7.5% on issue of final acceptance certificate of the works after performance and guarantee test.

41.6.1.5 FINAL BILL: As soon as possible after completion of the works to the satisfaction of the Employer the Contractor shall forward a certified final bill. It shall be accompanied by all relevant vouchers, such as royalty clearance certificate (if any) from appropriate authorities, submission of copies of working drawings, technical documents as required documents showing therein all additions and alternations etc. in the process of execution, completion certificate for embedded and covered up works, plant handing over certificate etc. as applicable.

The Contractor shall be paid full and final payment only after deduction of amounts paid against on account bill and any other amount due etc. payable by Contractor.

For extended warranty for three years, payment will be made against delivery of spares and consumables on FOR destination basis and price will remain firm till execution of contract.100% payment shall be made within 21(Twenty one) days of correct receipt and acceptance of materials or submission of bills, whichever is as later.

42.0 SETTLEMENT OF DISPUTES: It is incumbent upon the contractor to avoid litigation and disputes during the course of execution. However, if such disputes take place between the contractor and the department, effort shall be made first to settle the disputes at the company level. The contractor should make request in writing to the Engineer-in-charge for settlement of such disputes/ claims within 30 (thirty) days of arising of the cause of dispute/ claim failing which no disputes/ claims of the contractor shall be entertained by the company.

Effort shall be made to resolve the dispute in two stages In first stage dispute shall be referred to Area CGM,GM. If difference still persist the dispute shall be referred to a committee constituted by the owner. The committee shall have one member of the rank of Director of the company who shall be chairman of the committee.

If differences still persist, the settlement of the dispute shall be resolve in the following manner:

Disputes relating to the commercial contracts with Central Public Sector Enterprises / Govt. Departments (except Railways, Income Tax, Customs &excise duties) / State Public Sector Enterprises shall be referred by either party for Arbitration to the PMA (Permanent Machinery of Arbitration) in the department of Public Enterprises. In case of parties other than Govt. Agencies, the redressal of the dispute may be sought in the Court of Law.

43.0 SALES TAX ON WORKS CONTRACTS: All taxes, levies, cess, royalties, whether local, municipal, provincial or central pertaining to the contract are payable during the entire periods of contract, shall be to the contractor/ contractors account and shall be deemed to have been included in the contracted rate for the work to be executed by the contractor. The Company shall not be liable for any taxes or levies etc. whatsoever in connection with this contract. The company reserves the right to deduct/ withhold any amount towards taxes, levies, etc. and to deal with such amount in terms of the provisions of the Statute or in terms of the direction of any Statutory authority and the company shall only provide with certificate towards such deduction and shall not be responsible for any reason whatsoever.

SUB-SECTION 4.2

ADDITIONAL TERMS AND CONDITIONS OF CONTRACT

ADDITIONAL TERMS & CONDITIONS OF CONTRACT

The following additional terms & conditions are also acceptable to the company. The bidders are requested not to quote any additional conditions in their tender .

1. MOBILISATION ADVANCE :

i) In the case of works whose estimated value is more than Rs.100.00 lakhs , a maximum of 10%of the total contract value of work will be paid as mobilization advance subject to submission of Bank Guarantee for 110% advance amount.

ii) Mobilization Advance against survey, soil investigation, design & engineering will be paid in two equal installments - one after signing of the agreement and the second after the system design drawings have been completed and detailed design work is to be taken up by the contractor.

iii) Mobilization Advance against supply of equipments shall be released only after the contractor has finalised their venders/suppliers for the specific equipment and the amount of advance shall be proportionate to the value of equipment for which venders/suppliers have been finalised vis-a-vis the total value of equipments offered in the contract limited to 10% of the contract value.

iv) Mobilization Advance against works contract for site activities shall be paid in two equal installments. First installment shall be paid after the contractor has opened their site office and having finalised their subcontractors. The second installment shall be paid for taking procurement action of construction materials like reinforcing steel and structural steel by the contractor.

v) The mobilisation advance shall be recovered from the bills of the contractor from the second running on account bills onward @ 20% of the advance amount paid.

vi) The value of Bank Guarantee may be reduced to the extent such advance is recovered by the company subject to the conditions that the value of Bank Guarantee amount at any time is more than the recoverable outstanding advance. Bank Guarantee shall be irrevocable and from a Nationalized Bank /Scheduled Bank.

vii) Interest on mobilization advance will be charged as per the rate of CIL's borrowing rate under cash credit arrangement as varying from time to time.

2.0 PRICE VARIATION CLAU SE :

2.1 The contract price shall remain firm without any price variation due to escalation for the portions of survey, geo-engineering investigations, design and engineering and supply of equipments, plant and machineries as envisaged in the scope of work and the price agreed thereon as per the contract except the statutory increase/decrease in taxes and duties such as excise duty, sales tax, import duty etc.

2.1.1 If the contract is to be extended beyond the stipulated period for completion of the work due to fault on the part of the contractor escalation on prices should not be allowed further if not provided otherwise in the accepted contract.

2.2 For the portions of civil and structural works and erection and commissioning works of the plant &machineries, the price variation due to escalation shall be allowed to the extent as detailed hereinafter

2.2.1 If the prices of materials (not being materials supplied at fixed issue rates by the company) and wages of labour, required for execution of the work, increase, the contractor shall be compensated for such increase as per provisions detailed below:

a) The amount of the contract shall accordingly be varied, subject to the condition that such compensation for variation in prices shall be available only for the work done during the stipulated period of the contract as per the work programme agreed including such period for which the contract is validly extended under the provisions of the contract without any penal action.

b) The base date for working out such price variation shall be as on the last date of submission of bid (inclusive of price part) or the revised price bid (inclusive of revised offer if any), whichever is later

c) The compensation of Price variation shall be worked out at quarterly intervals and shall be with respect to the cost of work done during the previous three months. The first such payment shall be made at the end of three months after the month (Excluding) in which the tender was accepted and thereafter at three months' interval.

2.2.1.1 PRICE VARIATION FOR LABOUR:

The amount paid to the contractor for the work done shall be adjusted for increase or decrease in the cost of labour and the cost shall be calculated quarterly in accordance with the following formula:

$$V_L = W \times \frac{A}{100} \times \frac{L - Lo}{Lo}$$

Where:

V L = Variation in labour cost i.e. increase or decrease in the amount in rupees to be paid or recovered.

W = Value of work done during the period under reckoning to which the price variation relates as indicated in clause no. 2.3 of the 'ADDITIONAL TERMS & CONDITIONS OF CONTRACT'.

A = Component of labour expressed as percentage of the total value of work adopted from Table-1

Lo= Minimum wages for unskilled workers payable as per the Minimum Wages Act / Rules of the State or Central Government., whichever is more , applicable to the place of work as on the last date stipulated for receipt of the Price bids or Revised Price bids whichever is later.

L = Revised minimum wages of unskilled workers corresponding to Lo during the period to which the escalation relates.

2.2.1.2 Price Variation on Materials:

The amount to be paid to the contractor for the work done shall be adjusted for increase or decrease in the cost of materials and the cost shall be calculated quarterly in accordance with the following formula:

$$Vm = W \times \frac{B}{100} \times \frac{M - Mo}{Mo}$$

Where :

Vm = Variation in material cost i.e. increase or decrease in the amount in rupees to be paid or recovered.

W = Value of work done during the period under reckoning to which the price variation relates as indicated in clause no. 2.3 of the ' ADDITIONAL TERMS & CONDITIONS OF CONTRACT'.

B = Component of material expressed as percentage of the total value of work adopted fromTable-1

M = Average All India Wholesale Price Index for all commodities for the period to which price variation relates as published by the RBI Bulletin , Ministry of Industry & Commerce , Govt. Of India.

Mo = All India Wholesale Price Index for all commodities as published by the RBI Bulletin , Ministry of Industry & Commerce , Govt. Of India , relating to the last date on which the price bids Or revised price bids whichever is later were stipulated to be received.

2.2.1.3 PRICE VARIATION ON POL :

The amount to be paid to the contractor for the work done shall be adjusted for increase or decrease in the cost of POL and the cost shall be calculated quarterly in accordance with the following formula:

$$Vf = W \times \frac{C}{100} \times \frac{F - Fo}{Fo}$$

Where:

Vf = Variation in the cost of fuel , oil & lubricants increase or decrease in the amount in rupees to be paid or recovered.

W = Value of work done during the period under reckoning to which the price variation relates as indicated in clause no. 2.3 of the ' ADDITIONAL TERMS & CONDITIONS OF CONTRACT'.

C = Component of POL expressed as percentage of total value of work adopted from Table-1

F = Average Index Number for Wholesale Price for the group of "Fuel, power, light and lubricants "as published by the Economic Advisor, Ministry if Industry, Govt. of India for the period to which escalation/ de -escalation relates.

Fo = Index Number for Wholesale Price for the group of "Fuel, power, light and lubricants" as published by the Economic Advisor, Ministry if Industry, Govt. Of India prevalent on the last date of receipt of price bids or revised price bids whichever is later.

2.3 While Calculating The Value Of ''W'' The Following May Be Noted. :

The cost on which the escalation/price variation shall be payable shall be reckoned as 85% of the cost of work as per the bills to which escalation relates, and from this amount the value of materials supplied or services rendered at the prescribed charges under the relevant provisions of the contract, and proposed to recovered in the particular bill, shall be deducted before the amount of compensation for escalation/price variation is worked out. Further the cost shall not include any work for which payment is made at prevailing market rates.

2.4 In the event the price of materials and/ or wages of labour required for execution of the work decreases, there shall be downward adjustment of the work so that such price of materials and/or wages of labour shall be deductible from the cost of work under this contract and in this regard the formulae hereinbefore stated under this clause shall mutatis /mutandis apply. For all other works not listed above, the component of labour, material and POL of the total cost of work shall be as specifically indicated in the tender document.

The price variation clause as stated above will be applied for extended time frame of a contract by following the principles as under

i) Normally, if and when it is understood that a contract is not going to be completed within the scheduled time period, the contract is kept operative by extending the time of completion provisionally. During this provisional extended period the operation of the Price Variation Clause will remain suspended.

ii) If and when it is decided at the end of the successful completion of the work that the delay was due to causes not attributable to the contractor, then the Price Variation Clause will be revived and applied as if the scheduled date of completion has been shifted to the approved extended date.

iii) If it is decided at the end of successful completion of the work that the delay was due to the fault of the contractor then the Price Variation clause will not be revived and no payment will be made to the contractor on this account. Additionally the Clause related to Compensation for delay will be applied.

iv) In some cases the total delay may be partially due to causes not attributable to the contractor and partially due to his fault. It may be difficult to exactly quantify the total delay proportionately in such cases. The Price Variation Clause under such condition will be made operative for the entire extended time period by freezing the relevant indices on the date of the scheduled date of completion as originally fixed in the contract/ agreement. At the same time the Clause related to the compensation for delay will also be applied.

Table - 1

Value of A, B & C in the Price variation formula in the 'Additional Terms and Conditions of Contract:

Sl. No.	**Particulars**	**A (Labour component)**	**B (Material component)**	**C (POL component)**	**Remarks**
1.	For Building works	25	75	NIL	
2.	For Road works	15	80	05	
3.	For external sewerage, external water supply and external electrification	10	90	NIL	
4.	For external water supply, external sanitary and external electrification(Through labour rate contract)	75	25	NIL	
5.	For steel structural works	15	85	NIL	
6.	For steel structural works with Department free supply of rolled steel section(Through labour rate contract)	75	25	NIL	
7.	For coal handling plant Civil	25	75	NIL	

	works				
8.	For underground civil works such as incline Drivage, Shaft Sinking etc.	35	65	NIL	
9	For Erection and Commissioning of P&M	65	35	NIL	

2.5 CEILING ON PRICE VARIATION DUE TO ESCALATION: There shall be a ceiling on price variation due to escalation covered under clauses mentioned herein before on the whole contract, limited to 10% of the 'contract price' only.

2.6 VARIATION IN THE TAXES, DUTIES, LEVIES ETC: Other statutory variation due to increase in taxes, duties, levies etc. by Govt. (Central or State or Local)as of thirty (30) days prior to the date of opening of the bid or the revised price bid, whichever is later, with the taxes, duties, levies etc. during the manufacture/works/supply, as the case may be, shall be born by the owner. Similarly decrease in taxes, duties, levies etc. shall be returned/deducted to/by the owner.

SUB –SECTION 4.3

GENERAL TECHNICAL CONDITIONS

GENERAL TECHNICAL CONDITIONS

1.0 GENERAL: This part covers technical conditions pursuant to the contract and will form an integral part of the contract. The following provisions shall supplement all the detailed technical specifications and requirements brought out in the accompanying technical specifications. The contractor's proposal shall be based on the use of equipment and materials complying fully with the requirements, specified herein. It is recognized that the contractor may have standardized on the use of certain components, materials, processes or procedures different that those specified herein. Alternate proposals offering similar equipment based on the manufacturer's standard practice will also be considered provided such proposals meet the specified designs, standard and performance requirements and are acceptable to the owner.

2.0 LIMIT OF CONTRACT: Equipment furnished shall be complete in every respect with all mountings, fittings, fixtures and standard accessories normally provided with such equipment and/or needed for erection, completion and safe operation of the equipment as required by applicable codes though they may not have been specifically detailed in the technical specifications unless included in the list of exclusions. All similar standard components/parts of similar standard equipment provided, shall be inter-changeable with one another.

3.0 EQUIPMENT PERFORMANCE GUARANTEE:-

3.1 The performance tests of the equipment under the scope of the contract are detailed in the technical specifications. These guarantees shall supplement the general performance guarantee provisions covered under general terms & conditions of contract in clause entitled "Guarantee".

3.2 Liquidated damages for not meeting performance guarantee during the performance and guarantee tests shall be assessed and recovered from the contractor, as detailed in the technical specifications. Such liquidated damages shall be without any limitation whatsoever and shall be in addition to damages, if any payable under any other clauses of conditions of contract.

4.0 ENGINEERING DATA:-

4.1 The furnishing of engineering data by the contractor shall be in accordance with the schedule for each set of equipment as specified in the technical specifications. The review of these data by the engineer will cover only general conformance of the data to the specifications and documents interfaces with the equipment provided under the specifications, external connections and of the dimensions which might affect plant layout. This review by the engineer may not indicate a thorough review of all dimensions, quantities and details of the equipment, materials, any devices or items indicated or the accuracy of the information submitted. This review and/or approval by the engineer shall not be construed by the contractor, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications and documents.

4.2 All engineering data submitted by the contractor after final process including review and approval by the engineer shall form part of the contract documents and the entire works covered under these specifications shall be performed in strict conformity, unless otherwise expressly requested by the engineering writing.

5.0 DRAWING:-

5.1 All drawings submitted by the contractor including those submitted at the time of bid shall be sufficiently detailed to indicate the type, size, arrangement, weight of each component, break-up for packing and shipment, the external-connections, fixing arrangements required, the dimensions required for installation and inter-connections with other equipment and materials, clearances and spaces required between various portions of equipment and any other information specifically requested in the specifications.

5.2 Each drawing submitted by the contractor shall be clearly marked with the name of the owner, the unit designation, the specifications title, the specification number and the name of the project. If standard catalogue pages are submitted the applicable items shall be indicated therein. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be in metric units.

5.3 The owner may use a 35 mm microfilm system in processing drawings. All drawings shall be suitable for microfilming. Drawings which are not suitable for microfilming will not be accepted. A copy of each drawings reviewed will be returned to the contractor as stipulated herein. The owner may also accept and use disks/flash drives for computer based drawings.

5.3.1 Copies of drawings returned to the contractor will be in the form of a print with the owner's marking, or a print made from a microfilm of the marked up drawing or in the form of aperture cards if the contractor has facilities to process such cards or print made from floppies for computer based drawings.

5.4 The drawings submitted by the contractor shall be reviewed by the engineer as far as practicable within four (4) weeks and shall be modified by the contractor if any modifications and/or corrections are required by the engineer. The contractor shall incorporate such modifications and/or corrections and submit the final drawings for approval. Any delay arising out of failure by the contractor to rectify the drawings in good time shall not alter the contract completion date.

5.5 Approval by the Nodal Officer or his Nominee: the Contractor shall submit specifications and drawings showing the proposed Temporary Works to the Nodal Officer/Engineer-in-charge or his Nominee, who is to approve them if they comply with the specifications and drawings. The Contractor shall be responsible for design of Temporary Works. The Nodal Officer/Engineer-in-charge or nominee’s approval shall not alter the contractor’s responsibility for design of the Temporary Works.

5.6. The drawings sent for approval to the engineer shall be in quintuplicate. One print of such drawings will be returned to the contractor by the engineer marked approved/approved with corrections. The contractor shall thereupon furnish the owner with nine prints and one reproducible original of the drawings after incorporating all corrections.

5.7 Further work by the contractor shall be in strict accordance with these drawings and no deviation shall be permitted without the written approval of the engineer, if so required.

5.8 All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawings shall be at the contractor's risk. The contractor may make may changes in the design which are necessary to make the equipment conform, to the provisions and intent of the contract and such changes will again be subject to approval by the engineer. Approval of contractor's drawings or work by the engineer shall not relieve the contractor of any of his responsibilities and liabilities under the contract.

5.9 Drawings shall include all installation and detailed piping drawings wherever applicable. All piping100 mm and larger shall be routed in detail and smaller pipe shall be shown

schematically or by isometric drawings. All drawings shall be fully corrected to agree with actual as built construction.

5.10 Operating and Maintenance Manual: If "as built" drawings and/or operating and Maintenance Manuals are required the contract shall supply them by the dates stated in the contract data. If the Contractor does not supply the drawings and/or Manuals by the dates stated in the contract data, or they do not receive the Nodal Officer or his Nominee's approval, the Nodal Officer or his Nominee shall withhold the amount stated in the contract data from payments due to the contractor.

6.0 INSTRUCTION MANUALS:-

6.1 The contractor shall submit to the engineer, preliminary instruction manuals for all the equipment, covered under the contract within the time agreed upon between the owner & the contractor. The final instruction manuals complete in all respects shall be submitted by the contractor thirty (30) days before the first shipment of the equipment. The instruction manuals shall contain full details and drawings of all the equipment furnished, the erection procedures, testing procedures, operation and maintenance procedures of the equipment. These instruction manuals shall be submitted in the form of one (1) reproducible original and twelve (12) copies.

6.2 If after the commissioning and initial operation of the plant, the instruction manuals require any modifications/ additions/changes, the same shall be incorporated and the updated final instruction manuals in the form of one (1) reproducible original and twelve (12) copies shall be submitted by the contractor to the owner and also two copies to be submitted in soft copy in CDs/Pen drive.

6.3 The contractor shall furnish to the owner, twelve (12) sets of spare parts catalogue and two soft copies in CD/Pen-drive.

6.4 In addition the contractor shall supply two sets of all documents ,specification, operation and maintenance manuals (in hard copies also) and as built drawings in CDs/Pen drive in AutoCAD format to CCL. The document supplied shall be in easily readable ,search and printable format.

7.0 FIRST FILL OF CONSUMABLE, OILS AND LUBRICANTS: All the first fill of consumable such as oils, lubricants and essential chemicals etc., which will be required to put the equipment covered under the scope of the specifications, into successful trial operation, shall be furnished by the contractor unless specifically excluded under the exclusions in the specifications and other documents.

8.0 MANUFACTURING SCHEDULE: The contractor shall submit to the engineer his manufacture and delivery schedules for all equipment within thirty (30) days from the date of the letter of acceptance of tender. Such schedules shall be in line with the detailed net-work for all phases of the work of the contractor. Such schedules shall be reviewed, up-dated and submitted to the engineer, once every two (2) months thereafter, by the contractor. Schedule shall also include the materials and equipment purchased from outside suppliers.

9.0 REFERENCE STANDARDS

9.1 The codes and/or standards referred to in these specifications shall govern, in all cases wherever such references are made. In case of a conflict between such codes and/or standards and the specifications, the latter shall govern. Such codes and/or standards referred to shall mean the latest

revisions, amendments/changes adopted and published by the relevant agencies. In case of any further conflict in this matter, the same shall be referred to the engineer whose decision shall be final and binding.

9.2 Other internationally acceptable standards which ensure equal or higher performance than those specified shall also be accepted.

10.0 DESIGN IMPROVEMENT:-

10.1 The engineer or the contractor may propose changes in the specification of the equipment or quality thereof and if the parties agree upon any such changes the specification shall be modified accordingly.

10.2 If any such agreed upon change is such that it affects the price and schedule of completion, the parties shall agree in writing as to the extent of any change in the price and/or schedule of completion before the contractor proceeds with the change. Following such agreement the provision thereof, shall be deemed to have been amended accordingly.

11.0 QUALITY ASSURANCE:-

11.1 QUALITY ASSURANCE PROGRAMME: To ensure that the equipment and services under the scope of this contract whether manufactured or performed within the contractor's works or at his sub-contractor's premises or at the owner's site or at any other place of work are in accordance with the specifications, the contractor shall adopt suitable quality assurance programme to control such activities at all points necessary. Such programme shall be outlined by the contractor and shall be finally accepted by the engineer after discussions before the issue of letter of acceptance of tender. A quality assurance programme of the contractor shall generally cover the following :

a. his organization structure for the management and implementation of the proposed quality assurance programme:
b. documentation control system:
c. qualification data for bidder's key personnel:
d. the procedure for purchase of materials, parts components and selection of sub-contractor’s services including vendor analysis, source inspection, incoming raw-material inspection, verification of materials purchased etc.:
e. system for shop manufacturing and site erection control including process control and fabrication and assembly controls:
f. control of non-conforming items and system for corrective actions:
g. inspection and test procedure both for manufacture and field activities:
h. control of calibration and testing of measuring and testing equipment:
i. system for indication and appraisal of inspection status:
j. system for quality audits:
k. system for authorizing release of manufactured product to the owner:
l. system for maintenance of records:
m. system for handling storage and delivery: and
n. a quality plan detailing out the specific quality control procedure adopted for controlling the
quality characteristics relevant to each item of equipment furnished and each work at different

stages executed at work site.

11.2 QUALITY ASSURANCE DOCUMENTS: The contractor shall be required to submit the following Quality Assurance Documents within three weeks after dispatch of the equipment:

i. all non-destructive examination procedures stress relief and weld repair procedure actually used during fabrication.

ii. welder and welding operator qualification certificates.

iii. welder identification list, listing welder's and welding operator's qualification procedure and welding identification symbols.

iv. material mill test reports on components as specified by the specification.

v. the inspection plan with verification, inspection plan check points, verification sketches, if used, and methods used to verify that the inspection and testing points in the inspection plan were performed satisfactorily.

vi. Sketches and drawings used for indicating the method of traceability of the radiographs to the location on the equipment.

vii. All non-destructive examination result reports including radiography interpretation reports.

viii. Stress relief time temperature charts.

ix. Factory test results for testing required as per applicable codes and standard referred in the Specifications.

x. the engineer or his duly authorized representative reserves the right to carry out quality audit and quality surveillance of the systems and procedures of the contractor/his vendor's quality management and control activities.

12.0 ENGINEER'S SUPERVISION:-

12.1 To eliminate delays and avoid disputes and litigation it is agreed between the parties to the contract that all matters and questions shall be referred to the engineer and his decision shall be final.

12.2 The work shall be performed under the direction and supervision of the engineer. The scope of the duties of the engineer, pursuant to the contract, will include but not be limited to the following:

a. interpretation of all the terms and conditions of these documents and specification.

b. review and interpretation of all the contractor's drawings, engineering data etc.

c. witness or authorize his representative to witness tests and trials either at the manufacturer’s works or at site, or at any place where work is performed under the contract.

d. inspect, accept or reject any equipment, material and work under the contract.

e. issue certificate of acceptance and/or progressive payment and final payment certificates.

f. review and suggest modifications and improvements in completion schedules from time to time.

g. supervise the quality assurance programme implementation at all stages of the works.

h. to receive and endorse the dispatch documents enabling the contractor to clear the consignments.

13.0 INSPECTION, TESTING AND INSPECTION CERTIFICATE:-

13.1 The engineer, his duly authorized representative and/or outside inspection agency acting on behalf of the owner shall have at all reasonable times access to the contractor's premises or works and shall have the power at all reasonable times to inspect and examine the materials

and workmanship of the works during its manufacture or erection and if part of the works is being manufactured or assembled at other premises or works, the contractor shall obtain for the engineer and for his duly authorised representative permission to inspect as if the works were manufactured or assembled on the contractor's own premises or works.

13.2 The contractor shall give the Engineer/Inspector fifteen (15) days written notice of any material being ready for testing. Such tests shall be to the contractor's account except for the expenses of the Inspector.

The Engineer/Inspector, unless witnessing of the tests is virtually waived, will attend such tests within fifteen (15) days of the date on which the equipment is notified as being ready for test/inspection, failing which the contractor may proceed with the test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of tests in triplicate.

13.3 The Engineer or Inspector shall within fifteen (15) days from the date of inspection as defined herein give notice in writing to the contractor, of any objection to any drawings and all or any equipment and workmanship which in his opinion is not in accordance with the contract. The contractor shall give due consideration to such objections and shall either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the Engineer/Inspector giving reasons therein, that no modifications are necessary to comply with the contract.

13.4 When the factory tests have been completed at the contractor's or sub-contractor's works, the Engineer/Inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Engineer/Inspector, the certificate shall be issued within fifteen (15)days of the receipt of the contractor's test certificate by the Engineer/Inspector. Failure of the Engineer/Inspector to issue such a certificate shall not prevent the contractor from proceeding with the works. The completion of these tests or the issue of the certificate shall not bind the owner to accept the equipment should it, on further tests after erection, be found not to comply with the contract.

13.5 In all cases where the contract provides for tests whether at the premises or works of the contractor or of any sub-contractor, the contractor, except where otherwise specified, shall provide free of charge such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Engineer/Inspector or his authorized representative to carry out effectively such tests of the equipment in accordance with the contract and shall given facilities to the Engineer/Inspector or to his authorized representative to accomplish testing.

13.6 The inspection by Engineer and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the contractor in respect of the agreed quality assurance programme forming a part of the contract.

14.0 TEST:-

14.1 START UP:-

14.1.1 On completion of erection of the equipment and before start-up, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the Engineer and the contractor for correctness and completeness of installation and acceptability of start -up, leading to initial pre-commissioning tests at site.

The list of pre-commissioning tests to be performed shall be as mutually agreed and included in the contractor's quality assurance programme.

14.1.2 The contractor's commissioning/start-up engineers specifically identified as far as possible shall be responsible for carrying out all the pre-commissioning tests. On completion of inspection, checking and after the pre -commissioning tests are satisfactorily over, the complete equipment shall be placed on initial operation during which period the complete equipment shall be operated integral with sub -systems and supporting equipment as a complete plant referred hereinafter as plant.

14.2 TRIAL OPERATION:-

14.2.1 The plant shall then be on trial operation during which period all necessary adjustments shall be made while operating over the full load-range enabling the plant to be made ready for performance and guarantee tests.

14.2.2 The duration of trial operation of the complete equipment shall be fourteen (14) days out of which at least seventy two (72) hours shall be continuous operation on full load or any other duration as may be agreed to, between the engineer and the contractor. The trial operation shall be considered successful, provided that each item of the equipment can operate continuously at the specified operating characteristics, for the period of trial operation.

14.2.3 For the period of trial operation, the time of operation with any load shall be counted. Minor interruptions not exceeding four (4) hours at a time, caused during the continuous operation shall not affect the total duration of trial operation. However, if in the opinion of the engineer, the interruption is long, the trial operation shall be prolonged for the period of interruption.

14.2.4 A trial operation report comprising of observations and recordings of various parameters to be measured in respect of the above trial operation shall be prepared by the contractor. This report, besides recording the details of the various observations during trial run, shall also include the dates of start and finish of the trial operations and shall be signed by the representatives of both the parties. The report shall have sheets, recording all the details of interruptions occurred, adjustments made and any minor repairs done during the trial operation. Based on the observations, necessary modifications/ repairs to the plant shall be carried out by the contractor to the full satisfaction of the engineer to enable the later to accord permission to carry out performance and guarantee tests on the plant. However, minor defects which do not endanger the safe operation of the equipment, shall not be considered as reasons for with holding the aforesaid permission.

14.3 PERFORMANCE AND GUARANTEE TEST:-

14.3.1 The final test as to the performance and guarantees shall be conducted at site, by the owner. Such tests will be commenced within a period of two (2) months after successful completion of trial operations. Any extension of time beyond the above two (2) months shall be mutually agreed upon.

14.3.2 These tests shall be binding on both the parties of the contract to determine compliance of the equipment with the performance guarantees.

14.3.3 The available instrumentation and control equipment will be used during such tests and the engineer will calibrate all such measuring equipment and devices as far as practicable. However, un-measurable parameters shall be taken into account in a reasonable manner by the engineer, for the equipment of these tests. The tests will be conducted at the specified load points and as near the specified cycle condition as practicable. The engineer will apply proper corrections in calculation, to take into account conditions which do not correspond to the specified conditions.

14.3.4 Any special equipment, tools and tackles required for the successful completion of the performance and guarantee tests shall be provided by the contractor, free of cost.

14.3.5 The guaranteed performance figures of the equipment shall be proved by the contractor during these performance and guarantee tests. Should the results of these tests show any decrease from the guaranteed values, the contractor shall modify the equipment as required to enable it to meet the guarantees. In such case, performance and guarantee tests shall be repeated within one month, from the date the equipment is ready for re-tests and all cost for modifications including labour, materials and the cost of additional testing to prove that the equipment meets the guarantees, shall be borne by the contractor. Duration of performance guarantee tests will be of one month of which 6(six) days continuous on load operation is the minimum requirement and in case it fails , the process of performance guarantee tests will be repeated.

14.3.6 The specific tests to be conducted on equipment has been brought out in the technical Specifications.

14.3.7 Performance and guarantee test shall make allowance for instrumentation errors as may be decided by the engineer-in-charge.

14.4 TEST CODES: The provisions outlined in the ASME performance test codes or other international and Indian approved equivalents shall generally be used as a guide for all the above test procedures unless otherwise specified in the technical specifications.

14.5 PERFORMANCE AND GUARANTEE PARAMETERS: Performance guarantees parameters with acceptable tolerance limits as given below:

SL. No	**Name of Equipment**	**Guarantee Parameters**	**Acceptable tolerance limit**	**Remarks**
1	Rapid loading System	Rated Capacity	(-)4%	In the event of not achieving the guarantee parameters ,the owner shall recover LD @ 1.5% of the total contract price for every 1% shortfall in the performance or part thereof subject to 7.5% of the total contract price including escalations ,if any
		Pay load capacity of one wagon, ton	(±) 0.2%	
		Pay load capacity of one complete rake, ton	(±) 0.2%	
		Loading time of one wagon	(+)5%	
		Loading time of one complete rake	(+)5%	
2	Belt Conveyor	Rated Capacity	(-)4%	

15.0 PACKING:-

15.1 All the equipment shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at site till the time of erection. While packing all the materials, the limitation from the point of view of availability of railway wagon sizes in India should be taken into account. The contractor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing.

16.0 PROTECTION: All coated surfaces shall be protected against abrasions, impact, discoloration and any other Damages. All exposed threaded portions shall be suitably y protected with either a metallic or a non-metallic protecting device. All ends of all valves and piping and conduit equipment connections shall be properly sealed with suitable devices to protect them from damage. The parts which are likely to get rusted, due to exposure to weather, should also be properly treated and protected in a suitable manner.

17.0 PRESERVATIVE SHOP COATING:-

17.1 All exposed metallic surfaces subject to corrosion shall be protected by shop application of suitable coatings. All surfaces which will not be easily accessible after the shop assembly, shall beforehand be treated and protected for the life of the equipment. All surfaces shall be thoroughly cleaned of all mill scale, oxide and other coatings and prepared in the shop. The surfaces that are to be finish painted after installation or require corrosion protection until installation, shall be shop painted with at least two coats of primer. Transformers and other electrical equipment, if included shall be shop finished with one or more coats of primer and two coats of high grade resistance enamel. The finished colours shall be as per manufacturer's standards, to be selected and specified by the engineering at a later date.

17.2 Shop primer for all steel surface which will be exposed to operating temperature below 95ºC shall be selected by the contractor, after obtaining specific approval of the engineer regarding the quality of primer proposed to be applied. Special high temperature primer shall be used on surfaces exposed to temperatures higher than 95ºC and such primers shall also be subject to the approval of the engineer.

17.3 All other steel surfaces which are not to be painted shall be coated with suitable dust preventive compound subject to the approval of the engineer.

18.0 PROTECTIVE GUARDS: Suitable guards shall be provided for protection of personnel on all exposed rotating and/or moving machine parts. All such guards with necessary spares and accessories shall be designed for easy installation and removal for maintenance purposes.

19.0 DESIGN CO-ORDINATION: The contractor shall be responsible for the selection and design of appropriate equipment to provide the best co-ordinate performance of the entire system. The basic design requirements are detailed out in Technical Specifications. The design of various components, sub-assemblies and assemblies shall be so done, so that it facilitates easy field assembly and maintenance. All the rotating components shall be so selected that the natural frequency of the complete unit is not critical at or close to the operating range of the unit.

20.0 DESIGN CO-ORDINATION MEETING: The contractor will be called upon to attend design co-ordination meetings with the engineer, other contractors and the consultants of the owner

during the period of contract. The contractor shall attend such meetings at his own cost at the office of GM(E&M) ,CCL, Ranchi or at mutually agreed venue as and when required and fully co-operate with such persons and agencies involved during those discussions.

21.0 TOOLS AND TACKLES: The contractor shall supply with the equipment one complete set of all special tools and tackles forth erection, assembly, dis-assembly and maintenance of the equipment. However, these tools and tackles shall be separately packed and brought on to site.

22.0 NOISE LEVEL: The equivalent 'A' weighted sound level measured at a distance of 1.5 metres above floor level in elevation and one metre horizontally from the base of any equipment furnished and installed under these specifications, expressed in decibels to a reference of 0.0002 microbar, shall not exceed 85 dBA.

23.0 TAKING OVER: Upon successful completion of all the tests to be performed at site on equipment furnished and erected by the contractor, the engineer shall issue to the contractor a taking over certificate as a proof of the final acceptance of the equipment. Such certificate shall not unreasonably be with held nor will be engineer delay the issuance thereof, on account of minor omissions or defects which do not affect the commercial operation and/or cause any serious risk to the equipment. Such certificate shall not relieve the contractor of any of his obligations which otherwise survive, by the terms and conditions of the contract after issuance of such certificate

24.0 INDIAN STANDARDS: Normally Indian Standards as published by BUREAU OF INDIAN STANDARDS shall be followed. Wherever relevant Indian Standard is not published by the BIS, International Standards or American Standard or German Standard or British Standard, as decided by the Engineer in consultations with the Consultants employed by the Owner, shall be followed.

25.0 WELDING: If the manufacturer has special requirements relating to the welding procedures for welds at the terminals of the equipment to be procured by the owner under separate specifications, the requirements shall be submitted to the engineer in advance of commencement of erection work.

26.0 LUBRICATION: Equipment shall be lubricated by systems designed for continuous operation. Lubricant level indicators shall be furnished and marked to indicate proper levels under both stand -still and operating conditions.

27.0 EQUIPMENT BASES: A cast iron or welded steel base plate shall be provided for all rotating equipment which is to be installed on a concrete/structural steel base unless otherwise agreed to by the engineer. Each base plate shall support the unit and its drive assembly, shall be of a neat design with pads for anchoring the units, shall have a raised lip all around, and shall have threaded drain connections.

28.0 RATING PLATES, NAME PLATES AND LABELS:-

28.1 Each main and auxiliary items of plant is to have permanently attached to it in a conspicuous position a rating plate of non corrosive material upon which is to be engraved the manufacturer's name, equipment, type or serial number, together with details of the loading

conditions under which the item of plant in question have been designed to operate, and such diagram plates as may be required by the engineer.

28.2 Each item of plant is to be provided with a nameplate or label designating the service of the particular equipment. The inscriptions are to be approved by the engineer or shall be as detailed in the appropriate sections of the technical specifications.

28.3 Such nameplates or labels are to be of white non-hygroscopic material with engraved black lettering or, alternatively, in the case of indoor circuit breakers, starters etc. of transparent plastic material with suitably coloured lettering engraved on the back.

28.4 Items of plant such as valves, which are subject to handling, are to be provided with an engraved chromium plated nameplate or label with engraving filled with enamel.

28.5 All such name plates, instruction plates, lubrication charts etc. shall be bilingual with Hindi inscription first, followed by English. Alternatively two separate plates one with Hindi and the other with English inscriptions may be provided.

29.0 COLOUR CODE FOR PIPE SERVICES: All pipe services wherever applicable are to be painted in accordance with the owner's standard colour scheme, by the contractor.

30.0 SERVICE BY THE OWNER:-

30.1 The following services shall be provided by the owner :

i. Construction/ drinking water at one point within 100 metres of the work site, charges to be decided by the company.

ii. Auxiliary power for construction at one point within 100 metres of the work site, charges to be decided by the company.

30.2 In the event of the contractor requiring these services at parameters other than those specified above, for any systems, equipment, instrument etc. he shall make the necessary arrangements himself.

SUB-SECTION-4.4

ERECTION CONDITIONS OF CONTRACT

ERECTION CONDITIONS OF CONTRACT

1.0 GENERAL:-

1.1 The following shall supplement the conditions already contained in the other parts of these Specifications and documents and shall govern that portion of the work of this contract to be performed at site.

1.2 The contractor upon signing of the contract shall, in addition to a project coordinator, nominate another responsible officer as his representative at site suitably designated for the purpose of overall responsibility and co-ordination of the works to be performed at site. Such person shall function from the site office of the contractor during the pendency of contract.

2.0 REGULATION OF LOCAL AUTHORITIES AND STATUTES:-

2.1 The contractor shall comply with all the rules and regulations of local authorities during the performance of his field activities. He shall also comply with the minimum wages act, 1948 ,the payment of wages act (both of the Government of India and the local State Government) and the wages notified by CIL for contract laborer from time to time and the rules made there under in respect of any employee or workman employed or engaged by him or his subcontractor.

The contractor shall make all necessary payments of the Provident Fund for the workmen employed by him for the work as per the laws prevailing under provisions of CMPF and Allied Schemes and CMPF and Miscellaneous Provisions Act 1948 or Employees Provident Fund and Miscellaneous Provisions Act 1952 as the case may be.

2.2 All registration and statutory inspection fees, if any, in respect of his work pursuant to this contract shall be to the account of the contractor. However, any registration, statutory inspection fees lawfully payable under the provisions of the rules and regulations of the Government and any other statutory laws and its amendments from time to time during erection in respect of the plant equipment ultimately to be owned by the owner, shall be to the account of the owner. Should any such inspection or registration need to be arranged due to the fault of the contractor or his sub-contractor, the additional fees for such inspection and/or registration shall be borne by the contractor.

3.0 OWNER'S LIEN ON EQUIPMENT: The owner shall have lien on all equipment including those of the contractor brought to the site for the purpose of erection, testing and commissioning of the plant. The owner shall continue to hold the lien on all such equipment throughout the period of contract. No material brought to the site shall be removed from the site by the contractor and/or his sub-contractors without the prior written approval of the engineer.

4.0 INSPECTION, TESTING AND INSPECTION CERTIFICATES: The provisions of the clause entitled inspection testing and inspection certificates under section GTC shall also be applicable to the erection portion of the works. The engineer shall have the right to re-inspect any equipment though previously inspected and approved by him, at the contractor's works, before and after the same are constructed and/or erected at site. If by the above inspection, the engineer rejects any work or equipment, the contractor shall make good for such rejection either by replacement or modifications/repairs as may be necessary, to the satisfaction of the engineer. Such replacement will also include the replacement or re-execution of such of those works of other contractors and/or

agencies, which might have got damaged or affected by the replacements or re-work done to the contractor's work.

5.0 ACCESS TO SITE AND WORKS ON SITE:-

5.1 Suitable access to and possession of the site shall be accorded to the contractor by the owner in reasonable time.

5.2 The owner shall have the necessary foundations to be provided by him ready, as per the agreed schedule for the execution of the individual phases of works.

5.3 The works so far as it is carried out on the owner's premises, shall be carried out at such time as the owner may approve and the owner shall give the contractor reasonable facilities for carrying out the works.

5.4 In the execution of the works, no persons other than the contractor or his duly appointed representative, sub-contractor and workmen, shall be allowed to do work on the site, except by the special permission, in writing of the engineer or his representative.

6.0 CONTRACTOR'S SITE OFFICE ESTABLISHMENT: The contractor shall establish a site office at the site and keep posted an authorized representative for the purpose of the contract. Any written order or instruction of the engineer or his duly authorized representative, shall be communicated to the said authorized resident representing the contractor and the same shall be deemed to have been communicated to the contractor at his legal address.

7.0 CO-OPERATION WITH OTHER CONTRACTORS:-

7.1 The contractor shall co-operate with all other contractors or tradesmen of the owner, who may be performing other works on behalf of the owner and the workmen who may be employed by the owner and doing work in the vicinity of the works under the contract. The contractor shall also so arrange to perform his work as to minimize, to the maximum extent possible, interference with the work of other contractors and his workmen. Any injury or damage that may be sustained in the employees of the other contractors and the owner, due to the contractor's work shall promptly be made good at his own expense. The engineer shall determine the resolution of any difference or conflict that may arise between the contractor and other contractors or between the contractor and the workmen of the owner in regard to their work. If the works of the contractor is delayed because of any acts or omissions of another contractor, the contractor shall have no claim against the owner on that account other than an extension of time for completing his works.

7.2 The engineer shall be notified promptly by the contractor of any defects in the other contractor’s works that could affect the contractor's works. The engineer shall determine the corrective measures if any, required to rectify this situation after inspection of the works and such decisions by the engineer shall be binding on the contractor.

8.0 DISCIPLINE OF WORKMEN: The contractor shall adhere to the disciplinary procedure set by the engineer in respect of his employees and workmen at site. The engineer shall be at liberty to object to the presence of any representative or employees of the contractor at the site, if in the opinion of the engineer such employee has mis-conducted himself or be incompetent or negligent

or otherwise undesirable and then the contractor shall remove such a person objected to and provide in his place a competent replacement.

9.0 CONTRACTOR'S FIELD OPERATION:-

9.1 The contractor shall keep the engineer informed in advance regarding his field activity plans and schedules for carrying out each part of the works. Any review of such plan or schedule or method of work by the engineer shall not relieve the contractor of any of his responsibilities towards the field activities. Such reviews shall also not be considered as an assumption of any risk or liability by the engineer or the owner or any of his representatives and no claim of the contractor will be entertained because of the failure or inefficiency of any such plan or schedule or method of work reviewed. The contractor shall be solely responsible for the safety, adequacy and efficiency of plant and equipment and his erection methods.

9.2 The contractor shall have complete responsibility for the conditions of the work site including the safety of all persons employed by him or his sub-contractor and all the properties under his custody during the performance of the work. This requirement shall apply continuously till the completion of the contract and shall not be limited to normal working hours. The construction review by the engineer is not intended to include review of contractor's safety measures in, on or near the work-site, and their adequacy or otherwise.

10.0 PHOTOGRAPHS AND PROGRESS REPORT:-

10.1 The contractor shall furnish three (3) prints each to the engineer of progress photographs of the work done at site. Photographs shall be taken as and when indicated by the engineer or his representative. Photographs shall be adequate in size and number to indicate various stages of erection. Each photograph shall contain the date , the name of the contractor and the title of the photograph.

10.2 The above photographs shall accompany the monthly progress report detailing out the progress achieved on all erection activities as compared to the schedules. The report shall also indicate the reasons for the variance between the scheduled and actual progress and the action proposed for corrective measures wherever necessary.

11.0 MAN-POWER REPORT:-

11.1 The contractor shall submit to the engineer, on the first day of every month, a man hour schedule for the month, detailing the man hours scheduled for the month, skill wise and area -wise.

11.2 The contractor shall also submit to the engineer on the first day of every month, a man power report of the previous months detailing the number of persons scheduled to have been employed and actually employed, skill-wise and areas of employment of such labour.

12.0 PROTECTION WORK: The contractor shall have total responsibility for protecting his works till it is finally taken over by the engineer. No claim will be entertained by the owner or the engineer for any damage or loss to the contractor’s works and the contractor shall be responsible for the complete restoration of the damaged works to its original condition to comply with the specifications and drawings. Should any such damage to the contractor's works occur because of other party not under his supervision or control, the contractor shall make his claim directly with

the party concerned. If dis-agreement or conflict or dispute develops between the contractor and the other party or parties concerned regarding the responsibility for damage to the contractor's works the same shall be resolved as per the provisions of the clause 7.0 above entitled cooperation with other contractors. The contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such disputes. The contractor shall proceed to repair the work immediately and the cause thereof will be assigned pending resolution of such dispute.

13.0 EMPLOYMENT OF LABOUR:-

13.1 The contractor will be expected to employ on the work only his regular skilled employees with experience of his particular work. No female labour shall be employed after darkness no persons below the age of eighteen years s hall be employed.

13.2 All traveling expenses including provisions of all necessary transport to and from site lodging allowances and other payments to contractor's employees shall be the sole responsibility of the contractor.

13.3 The hour of work on the site shall be decided by the owner and the contractor shall adhere to it. Working hours will normally be eight (8) hours per day- Monday to Saturday.

13.4 Contractor's employees shall wear identification badges while on work at site.

13.5 In case the owner becomes liable to pay any wages or dues to the labour or to any Government agency under any of the provisions of the Minimum Wages Act, Workmen compensation Act, Contract Labour Regulation Abolition Act, CMPF Act/EPF Act or any other law due to act of omission of the contractor, the owner may make such payments and shall recover the same from the contractor's bills.

14.0 FACILITIES TO BE PROVIDED BY THE OWNER:-

14.1 SPACE : The contractor shall advise the owner within thirty (30) days from the date of acceptance of the letter of award, about his exact requirement of space for his office, storage area, pre-assembly and fabrication areas, toilets, etc. The above requirement shall be reviewed by the engineer and space will be allotted to the contractor for construction of his temporary structures like office, storage sheds and other utilities etc. for his own as well as his sub-contractor's use.

14.2 ELECTRICITY: The contractor shall submit to the engineer within thirty (30) days from the date of acceptance of the award letter, his electrical power requirements, if any, to allow the planning of the temporary electrical distribution by the engineer. The contractor shall be provided with supply of electricity for the purposes of the contract, only at one point in the project site. The contractor shall make his own further distribution arrangement. All temporary wiring must comply with local regulations and will be subject to engineer’s inspection and approval before connection to supply. Power The contractor shall be charged for the power supplied at prevalent rate of power supplied by State Electricity Board.

14.3 WATER: Supply of water will be made available for the construction purposes at an agreed single point within100 metres of the work site. And further distribution will be the responsibility of the contractor. The contractor shall be charged for the water supplied at work site @ 1% of the value of civil works and shall be deducted from the contractor's running/final bills.

15.0 FACILITIES TO BE PROVIDED BY THE CONTRACTOR:-

15.1 TOOLS, TACKLES AND SCAFFOLDINGS: The contractor shall provide all the construction equipment, tools, tackles and scaffoldings required for pre-assembly, erection, testing and commissioning of the equipment covered under the contract. He shall submit a list of all such

materials to the engineer before the commencement of pre-assembly at site. These tools and tackles shall not be removed from the site without the written permission of the engineer.

15.2 COMMUNICATION: The owner will extend the telephone & telex facilities, if available at site, for purposes of contract. The contractor shall be charged at actual for such facilities.

15.3 FIRST – AID:-

15.3.1 The contractor shall provide necessary first-aid facilities for all his employees, representatives and workmen working at the site. Enough number of contractor's personnel shall be trained in administering first-aid.

15.3.2 The owner will provide the contractor, in case of an emergency, the services of an ambulance for transportation to the nearest hospital.

15.4 CLEANLINESS:-

15.4.1 The contractor shall be responsible for keeping the entire area allotted to him clean and free from rubbish, debris etc. during the period of contract. The contractor shall employ enough number of special personnel to thoroughly clean his work area at least once in a day. All such rubbish and scrap material shall be stacked or disposed in a place to be identified by the engineer. Material sand stores shall be so arranged to permit easy cleaning of the area in areas where equipment might drip oil and cause damage to the floor surface, a suitable protective cover of a flame resistant, oil proof sheet shall be provided to protect the floor from such damage.

15.4.2 Similarly the labour colony, the offices and the residential areas of the contractor's employees and workmen shall be kept clean and neat to the entire satisfaction of the engineer. Proper sanitary arrangement shall be provided by the contractor, in the work areas, office and residential areas of the contractor.

16.0 LINES AND GRADES: All the works shall be performed to the lines, grades and elevations indicated on the drawings. The contractor shall be responsible to locate and layout the works. Basic horizontal and vertical control points will be established and marked by the engineer at site at suitable points. These points shall be used as datum for the works under the contract. The contractor shall inform the engineer well in advance of the times and places at which he wishes to do work in the area allotted to him, so that suitable datum points may be established and checked by the engineer to enable the contractor to proceed with his works. Any work done without being properly located may be removed and/or dismantled by the engineer at contractor’s expense.

17.0 FIRE PROTECTION:-

17.1 The work procedures that are to be used during the erection shall be those which minimise fire hazards to the extent practicable. Combustible materials, combustible waste and rubbish shall be collected and removed from the site at least once each day. Fuels, oils and volatile or flammable materials shall be stored away from the construction and equipment and materials storage areas in safe containers. Untreated canvas paper, plastic or other flammable flexible materials shall not at all be used at site for any other purpose unless otherwise specified. If any such materials are received with the equipment at the site, the same shall be removed and replaced with acceptable material before moving into the construction area or storage.

17.2 Similarly corrugated paper fabricated cartons etc. will not be permitted in the construction area either for storage or for handling of materials. All such materials used shall be water proof and flame resistant type. All the other materials such as working drawings, plants, etc. which are combustible but are essential for the works to be executed shall be protected against combustion resulting from welding sparks, cutting flames and other similar fire sources.

17.3 All the contractor's supervisory personnel and sufficient number of workers shall be trained for fire -fighting and shall be assigned specific fire protection duties. Enough of such trained personnel must be available at the site during the entire period of the contract.

17.4 The contractor shall provide enough fire protection equipment of the types and number for the ware -houses, office, temporary structures, labour colony area etc. Access to such fire protection equipment, shall be easy and kept open at all times.

18.0 SECURITY: The contractor shall have total responsibility for all equipment and materials in his custody stored, loose, semi-assembled and/or erected by him at site. The contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and los s. All materials of the contractor shall enter and leave the project site only with the written permission of the engineer in the prescribed manner.

19.0 CONTRACTOR'S AREA LIMITS: The engineer will mark-out the boundary limits of access roads, parking spaces, storage and Construction areas for the contractor and the contractor shall not trespass the areas not so marked out for him. The contractor shall be responsible to ensure that none of his personnel move out of the areas marked out for his operations. In case of such a need for the contractor's personnel to work out of the areas marked out for him, the same shall be done only with the written permission of the engineer.

20.0 CONTRACTOR'S CO-OPERATION WITH THE OWNER: In cases where the performance of the erection work by the contractor affects the operation of the system facilities of the owner, such erection work of the contractor shall be scheduled to be performed only in the manner stipulated by the engineer and the same shall be acceptable at all times to the contractor. The engineer may impose such restrictions on the facilities provided to the contractor such as electricity, water, etc. as he may think fit in the interest of the owner and the contractor shall strictly adhere etc. such restrictions and co-operate with the engineer. It will be the responsibility of the contractor to provide all necessary temporary instrumentation and other measuring devices required during start-up and operation of the equipment systems, which are erected by him. The contractor shall also be responsible for flushing and initial filling of all the oil and lubricants required for the equipment furnished and erected by him, so as to make such equipment ready for operation. The contractor shall be responsible for supplying such flushing oil and other lubricants unless otherwise specified elsewhere in these documents & specifications.

21.0 PRE-COMMISSIONING TRIALS AND INITIAL OPERATIONS: The pre-commissioning trials and initial operations of the equipment furnished and erected by the contractor shall be the responsibility of the contractor as detailed in relevant clauses in section GTC. The contractor shall provide, in addition, test instruments, calibrating devices, etc. and the labour required for the successful performance of these trials. It is anticipated that the above test may

prolong for a long time, the contractor's workmen required for the above test shall always be present at site during such trials.

22.0 MATERIALS HANDLING AND STORAGE:-

22.1 All the equipment furnished under the contract and arriving at site shall be promptly received, unloaded and transported and stored in the storage spaces by the contractor.

22.2 Contractor shall be responsible for examining all the shipment and notify the engineer immediately or any damage, shortage, discrepancy, etc. for the purpose of engineer's information only. The contractor shall submit to the engineer every week a report detailing all the receipts during the week. However, the contractor shall be solely responsible for any shortages or damage in transit, handling and/or in storage and erection of the equipment at the site. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc. shall be to the account of the contractor.

22.3 The contractor shall maintain an accurate and exhaustive record detailing out the list of all equipment received by him for the purpose of erection and keep such record open for the inspection of the engineer at any time.

22.4 All equipment shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings, etc. shall be used for unloading and/or handling of the equipment without the specific written permission of the engineer. The equipment stored shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the store shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site.

22.5 All electrical panels, control gear, motors and such other devices shall be properly dried by heating before they are installed and energized. Motor bearings, slip rings, commentators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected. Heavy rotating parts in assembled conditions shall be periodically rotated to prevent corrosion due to prolonged storage.

22.6 All the electrical equipment such as motors, generators, etc. shall be tested for insulation resistance at least once in three months from the date of receipt till the date of commissioning and a record of such measured insulation values maintained by the contractor. Such records shall be open for inspection by the engineer.

22.7 The contractor shall ensure that all the packing materials and protection devices used for the various equipment during transit and storage are removed before the equipment are installed.

22.8 The consumable and other supplies likely to deteriorate due to storage must be thoroughly protected and stored in a suitable manner to prevent damage or deterioration in quality by storage.

22.9 All the materials stored in the open or duty location must be covered with suitable weather-proof and flameproof covering materials wherever applicable.

22.10 If the materials belonging to the contractor are stored in areas other than those earmarked for him, the engineer will have the right to get it moved to the area earmarked for the contractor at the contractor’s cost.

22.11 The contractor shall be responsible for making suitable indoor storage facilities to store all equipment which require indoor storage. Normally, all the electrical equipment such as motors, control gear, generators, exciters and consumable like electrodes, lubricants etc.

shall be stored in the closed storage space. The engineer, in addition, may direct the contractor to move certain other materials which in his opinion will require indoor storage, to indoor storage areas which the contractor shall strictly comply with.

23.0 CONSTRUCTION MANAGEMENT:-

23.1 The field activities of the contractors working at site, will be co-ordinate by the engineer and the engineer's decision shall be final in resolving any disputes or conflicts between the contractor and other contractors and tradesmen of the owner regarding scheduling and co-ordination of work. Such decision by the engineer shall not be a cause for extra compensation or extension of time for the contractor.

23.2 The engineer shall hold weekly meetings of all the contractors working at site, at a time and a place to be designated by the engineer. The contractor shall attend such meetings and take notes of discussions during the meeting and the decisions of the engineer and shall strictly adhere to those decisions in performing his works. In addition to the above weekly meetings, the engineer may call for other meetings either with individual contractors or with selected number of contractors and in such a case the contractor, if called will also attend such meetings.

23.3 Time is the essence of the contract and the contractor shall be responsible for performance this works in accordance with the specified construction schedule. If at any time, the contractor is falling behind the schedule, he shall take necessary action to make good for such delays by increasing his work force or by working overtime or otherwise accelerate the progress of the work to comply with the schedule and shall communicate such actions in writing to the engineer, satisfying that his action will compensate for the delay. The contractor shall not be allowed any extra compensation for such action.

23.4 The engineer shall however not be responsible for provision of additional labour and/or materials or supply or any other services to the contractor except for the co-ordination work between various contractors as set out earlier.

24.0 FIELD OFFICE RECORDS: The contractor shall maintain at his site office up-to-date copies of all drawings, specifications and other contract documents and any other supplementary data complete with all the latest revisions thereto. The contractor shall also maintain in addition the continuous record of all changes to the above contract documents, drawings, specifications, supplementary data, etc. effected at the field and on completion of his total assignment under the contract shall incorporate all such changes on the drawings and other engineering data to indicate as installed condition of the equipment furnished and erected under the contract. Such drawings and engineering data shall be submitted to the engineer in required number of copies. Daily work programme with progress of the previous day and deployment of labour related to work programme and attendance of workmen deployed during the previous day shall be maintained in a register. This register shall be signed by authorized representative of the contractor which will then be checked and signed by the owner's representative. Every three months this register shall be deposited to the owner which shall then be owner's property.

25.0 CONTRACTOR'S MATERIALS BROUGHT ON TO SITE:-

25.1 The contractor shall bring to site all equipment, parts, materials, including construction equipment, tools and tackles for the purpose of the works with intimation to the engineer. All such goods shall, from the time of their being brought vest in the owner, but may be

used for the purpose of the works only and shall not on any account be removed or taken away by the contractor without the written permission of the engineer. The contractor shall nevertheless be solely liable and responsible for any loss or destruction thereof and damage thereto.

25.2 The owner shall have a lien on such goods for any sum or sums which may at any time be due or owing to him by the contractor, under, in respect of or by reasons of the contract. After giving a fifteen (15)days' notice in writing of his intention to do so, the owner shall be at liberty to sell and dispose of any such goods, in such manner as he shall think fit including public auction or private treaty and to apply the proceeds in or towards the satisfaction of such sum or sums due as aforesaid.

25.3 After the completion of the works, the contractor shall remove from the site under the direction of the engineer the materials such as construction equipment, erection tools and tackles, scaffolding etc. with the written permission of the engineer. If the contractor fails to remove such materials, within 15 days of issue of a notice by the engineer to do so then the engineer shall have the liberty to dispose of such materials as detailed under clause 25.2 above and credit the proceeds thereto the account of the contractor.

26.0 PROTECTION OF PROPERTY AND CONTRACTOR'S LIABILITY:-

26.1 The contractor shall be responsible for any damage resulting from his operations. He shall also be responsible for protection of all persons including members of public and employees of the owner and the employees of other contractors and sub-contractors and all public and private property including structures, buildings, other plants and equipment and utilities either above or below the ground.

26.2 The contractor will ensure provision of necessary safety equipment such as barriers, sign-boards, warning lights and alarms, etc. to provide adequate protection to persons and property. The contractor shall be responsible to give reasonable notice to the engineer and the owners of public or private property and utilities when such property and utilities are likely to get damaged or injured during the performance of his works and shall make all necessary arrangements with such owners, related to removal and/o replacement or protection of such property and utilities.

27.0 PAINTING: All exposed metal parts of the equipment including pipings, structure railing etc. wherever applicable, after installation unless otherwise surface protected, shall be first painted with at least one coat of suitable primer which matches the shop primer paint used, after thoroughly cleaning all such parts of all dirt, rust, scales, greases, oils and other foreign materials by wire brushing, scarping or sand blasting, and the same being inspected and approved by the engineer for painting. Afterwards, the above parts shall be finished with two coats of alloyed resin machinery enamel paints. The quality of the finish paint shall be as per the standards of ISI or equivalent and to be of the colour as approved by the engineer.

28.0 INSURANCE:-

28.1 In addition to the conditions covered under the clause entitled insurance in general terms and conditions of contract of this volume-1, the following provisions will also apply to the portion of the works to be done beyond the contractor's own or his sub-contractor's works.

28.2 Workmen's compensation insurance

This insurance shall protect the contractor against all claims applicable under the Workmen's Compensation Act 1948 (Government of India). This policy shall also cover the contractor against claims for injury, disability disease or death of his or his sub-contractor's employees, which for any reason are not covered under the Workmen's Compensation Ac t 1948. The liabilities shall not be less than

Workmen's compensation	As per statutory provisions
Employer's liability	As per statutory provisions

28.3 Comprehensive Automobile Insurance

This insurance shall be in such a form to protect the contractor against all claims for injuries, disability, disease and death to members of public including the owner's men and damage to the property of others arising from the use of motor vehicles during on or off the site operations, irrespective of the owners hip of such vehicles.

28.4 Comprehensive General Liability Insurance

28.4.1 This insurance shall protect the contractor against all claims arising from injuries, disabilities, disease or death of members of public or damage to property of others, due to any act or omission on the part of the contractor, his agents, his employees, his representatives and sub-contractors or from riots, strikes and civil commotion. The insurance shall also cover all the liabilities of the contractor arising out of the clause entitled defense of suits under General Terms and Conditions of contracts of this volume. 1.

28.4.2 The hazards to be covered will pertain to all the works which and areas where the contractor, his sub-contractors, his agents and his employees have to p reform work pursuant to the contract.

28.5 The above are only illustrative list of insurance covers normally required and it will be the responsibility of the contractor to maintain all necessary insurance coverage to the extent both in time and amount to take care of all his liabilities either direct or indirect, in pursuance of the contract.

29.0 UNFAVOURABLE WORKING CONDITIONS: The contractor shall confine all his field operations to those works which can be performed without subjecting the equipment and materials to adverse effects, during inclement weather conditions, like monsoon, storms, etc. and during other unfavorable construction conditions. No field activities shall be performed by the contractor under conditions which might adversely affect quality and efficiency thereof, unless special precautions or measures are taken by the contractor in a proper and satisfactory manner in performance of such works and with concurrence of the engineer. Such unfavorable construction conditions will in no way relieve the contractor of his responsibility to perform works as per the schedule.

30.0 PROTECTION OF MONUMENTS AND REFERENCE POINTS: The contractor shall ensure that any finds such as relic, antiquity, coins, fossils, etc. which he might come across during the course of performance of his works either during excavation or elsewhere, are properly protected and handed over to the engineer. Similarly the contractor shall ensure that the benchmarks, reference points, etc., which are marked out either with the help of engineer or by the engineer shall not be disturbed in any way during the performance of his works. If any work is to be performed which disturb such references, the same shall be done only after these are transferred to other suitable locations under the direction of the engineer. The contractor shall provide all necessary materials and assistance for such relocation of reference points etc.

31.0 WORK AND SAFETY REGULATIONS:-

31.1 The contractor shall ensure proper safety of all the workmen, materials plant and equipment belonging to him or the Company or to others, working at or near the site. The contractor shall also be responsible for provision of all safety notices and safety equipment required both by the relevant legislation and the engineer-in-charge as he may deem necessary.

31.2 The contractor will notify well in advance to the engineer -in-charge of his intention to bring to the site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. The engineer-in-charge shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the contractor shall strictly adhere to and comply with such instructions. The engineer-in-charge shall have the right at his sole discretion to inspect any such container or such construction plant/equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its 'use. No claim due to such prohibition shall be entertained by the owner. Nor the owner shall entertain any claim of the contractor towards additional safety provisions/conditions to be provided for constructed as per engineer-in-charge's instructions.

Further any such decision of engineer-in-charge shall not, in any way, absolve the contractor of his responsibilities, and in case, use of such a container or entry thereof into the site area is forbidden by engineer-in-charge, the contractor shall use alternative methods with the approval of engineer-in-charge without any cost implication to Company or extension of work schedule.

31.3 Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives, the contractor shall be responsible for carrying out such provision and/or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act 1948, and Petroleum and Carbide of Calcium Manual Published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the engineer -in-charge. In case, any approvals are necessary from the Chief Inspector (Explosive) or any statutory authorities, the contractor shall be responsible for obtaining the same.

31.4 All equipment used in construction and erection by contractor shall meet Indian, Inter – national Standards and where such standards do not exist, the contractor shall ensure these to be absolutely safe. All equipment shall be strictly operated and maintained by the contractor in accordance with manufacturer's operation manual and safety instructions and per Guidelines/Rules of the Company in this regard.

31.5 Periodical Examinations and all tests for all lifting/hoisting equipment and tackles shall be carried out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act 1910 and associated Laws/Rules enforced from time to time. A register of such examinations and tests shall be properly maintained by the contractor and will be promptly produced as and when desired by engineer–inchargeor by the person authorized by him.

31.6 The contract shall be fully responsible for the safe storage of his and his sub-contractors radio-active sources in accordance with BARC/DAE Rules and other applicable provisions. All precautionary measures stipulated by BARC/DAE in connection with use, storage and handling of such material will be taken by contractor.

31.7 The contractor shall provide suitable safety equipment of prescribed standard to all employee and workmen according to the need, as may be directed by engineer-in-charge

who will also have right to examine these safety equipment to determine their suitability, reliability, acceptability and adaptability.

31.8 Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person strictly in accordance with the code practices/rules framed under Indian Explosives Act pertaining to handling, storage and use of the explosives.

31.9 The contractor shall provide safe working conditions to all workmen and employees at the site including safe means of access, railings, stairs, ladders, scaffoldings etc. The scaffoldings, stairs, ladders etc. shall be erected under the control and supervision of an experienced and competent person. For erection, good and standard quality of material only shall be used by the contractor.

31.10 The contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the owner or other contractors under any circumstances, whatsoever, unless expressly permitted in writing by the Company to handle such fuses, wiring or electrical equipment.

31.11 Before the contractor connects any electrical appliances to any plug or socket belonging to the other contractor or owner, he shall:

a. satisfy the engineer that the appliances is in good working condition

b. inform the engineer of the maximum current rating, voltage and phases of the appliances.

c. Obtain permission of the engineer detailing the sockets to which the appliances may be connected.

31.12 The engineer will not grant permission to connect until he is satisfied that:

a .the appliance is in good condition and is fitted with a suitable plug.

b. the appliance is fitted with a suitable cable having two earth conductors, one of which shall be an earthed metal sheath surrounding the cores.

31.13 No electric cable is in use by the contractor/owner will be disturbed without prior permission. No weight of any description will be imposed on any cable and no ladder or similar equipment will rest against or attached to it.

31.14 No repair work shall be carried out on any live equipment. The equipment shall must be declared safe by engineer-in-charge and a permit to work shall be issued by engineer-in-charge before any repair work is carried out by the contractor. While working on electric lines/equipments whether alive or dead, suitable type and sufficient quantity of tools will have to be provided by contractor to electricians/workmen/officers.

31.15 The contractor shall employ necessary number of qualified, full time electricians/ electrical supervisors to maintain in his temporary electrical installations.

31.16 The contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as safety officer to supervise safety aspects of the equipment and workmen who will co-ordinate with the project safety officer.

In case of work being carried out through sub-contractor, the sub-contractor's workmen/employees will also be considered as the contractor's employees/workmen for above purpose. The name and address of a safety officer of contractor will be promptly informed in writing to engineer-in-charge with a copy to safety officer-in charge before he starts work or immediately after any change of the incumbent is made during currency of the contract.

31.17 In case any accident occurs during the construction/erection or other associated activities undertaken by the contractor thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the contractor to promptly inform the same to the company's engineer-in-charge in prescribed form and also to all the authorities envisaged under the applicable laws.

31.18 The engineer-in-charge shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the person sand/or property, and/or equipment. In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove short comings promptly. The contractor after stopping the specific work, can, if felt necessary, appeal against the order of stoppage of work to the General Manager of the project within 3 days of such stoppage of work and decision of the project G.M in this respect shall be conclusive and binding on the contractor.

31.19 The contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided in para 31.18 above and the period of such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of levy of liquidate damages.

31.20 The contractor shall follow and comply with all the Company safety rules relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without demur, protest or content or reservation. In case of any inconformity between statutory requirement and the Company safety rules referred above, the later shall be binding on the contractor unless the statutory provisions are more stringent.

31.21 If the contractor fails in providing safe working environment as per the Company safety rules or continues the work even after being instructed to stop work by engineer -in-charge as provided in para above(31.18), the contractor shall promptly pay to the Company, on demand i.e. by the owner compensation at the rate of Rs. 5,000/= per day or part there of till the instructions are complied with an so certified by engineer -in-charge. However in case of accident taking place causing injury to any individual, the provisions contained in para (31.22) shall also apply in addition to compensation mentioned in this para.

31.22 If the contractor does not take all safety precautions and/or fails to comply with the safety rules as prescribed by the Company or under the applicable laws for the safety of the equipment and plant and for the safety of personnel and the contractor does not prevent hazardous conditions which cause injury to his own employees or employees of other contractors, or the Company employees or any other person who are at site or adjacent thereto, the contractor shall be responsible for payment of compensation under the relevant provisions of the workmen's compensation act and rules framed there under or any other applicable laws as applicable from time to time.

Permanent disablement shall have same meaning as indicated in workmen's compensation act. The compensation mentioned above shall be in addition to the compensation payable to the workmen/employees under the relevant provisions of the workmen's compensation act and rules framed hereunder or any other applicable laws as applicable from time to time.

In case the owner is made to pay such compensation then the contractor is liable to reimburse the owner such amount.

32.0 CODE REQUIREMENTS: The erection requirements and procedures to be followed during the installation of the equipment shall be in accordance with the relevant Indian Regulations.

ASME codes and accepted good engineering practice, the engineer's drawings and other applicable Indian recognized codes and the laws and regulations of the Government of India.

33.0 FOUNDATION DRESSING AND GROUTING:-

33.1 The surfaces of foundations shall be dressed to bring the top surface of the foundations to the required level, prior to placement of equipment/equipment bases on the foundations.

33.2 All the equipment bases and structural steel base plates shall be grouted and finished as per these specifications unless otherwise recommended by the equipment manufacturer.

33.3 The concrete foundation surfaces shall be properly prepared by chipping, grinding as required to bring the type of such foundation to the required level, to provide the necessary roughness for bondage and to assure enough bearing strength. All laitance and surface film shall be removed and cleaned.

33.4 GROUTING MIX: The grouting mixtures shall be composed of Portland cement, sand and water. The Portland cement to be used shall conform to ISI No. 269 or equivalent, sand shall conform to ISI No.383/2386 or equivalent. The grout proportions for flat based where the grouting space does not exceed 35 mm shall be 50 Kg bag of cement to 75 Kg of sand. Only the required quantity of water shall be added so as to make the mix quaky and flowable and the mix shall not show excess water on top when it is being puddled in place. For thicker grout beds up to 65 mm, the amount of sand shall be increased to 105 Kg per bag of cement. Bases which are hollow and are to be filed full of grouting shall be filled to a level of 25 mm above the outside rim with a mortar mix in the volumetric proportions of one bag of cement and 1.5 bags sand and 1.5 part 6 mm granite gravel. An acceptable plasticizer may be added to the grout mixes in a proportion recommended by the plasticizers manufacturer. All such grouts shall be thoroughly mixed for not less than five minutes in an approved mechanical mixer and shall be used immediately after mixing.

33.5 PLACING OF GROUT:-

33.5.1 After the base has been prepared, its alignment and level has been checked and approved and before actually placing the grout a low dam shall be set around the base at a distance that will permit pouring and manipulation of the grout. T he height of such dam shall be at least 25 mm above the bottom of the base. Suitable size and number of chains shall be introduced under the base before placing the grout, so that such chains can be moved back and forth to push the grout into every part of the space under the base.

33.5.2 The grout shall be poured either through grout holes if provided or shall be poured at one side or at two adjacent sides giving it a pressure head to make the grout move in a solid mass under the base and out in the opposite side. Pouring shall be continued until the entire space below the base is thoroughly filled and the grout stands at least 25 mm higher all around than the bottom of the base. Enough care should be taken to avoid any air or water pockets beneath the bases.

33.6 FINISHING OF THE EDGES OF THE GROUT: The poured grout should be allowed to stand undisturbed until it is well set. Immediately thereafter, the dam shall be removed and grout which extends beyond the edges of the structural or equipment base plates shall be out off flush and removed. The edges of the grout shall then be pointed and finished with1:2 cement mortar pressed

firmly to bond with the body of the grout and smoothed with a tool to present smooth vertical surface. The work shall be done in a clean and scientific manner and the adjacent floor spaces, exposed edges of the foundations, and structural steel and equipment base plates shall be thoroughly cleaned of any spillage of the grout

33.7 CHECKING OF EQUIPMENT AFTER GROUTING: After the grout is set and cured, the contractor shall check and verify the alignment of equipment, alignment of shafts of rotating machinery, the slopes of all bearing pedestals, centring of rotors with respect to their sealing bores, couplings, etc. as applicable and the like items to ensure that no displacement had taken place during grouting . The values recorded prior to grouting shall be used during such post grouting check-up and verifications. Such pre and post grout records of alignment details shall be maintained by the contractor in a manner acceptable to the engineer.

34.0 SHAFT ALIGNMENTS: All the shafts of rotating equipment shall be properly aligned to those of the matching equipment to as perfect accuracy as practicable. The equipment shall be free from excessive vibration so as to avoid over-heating of bearings or other conditions which may tend to shorten the life of the equipment. All bearings, shafts and other rotating parts shall be thoroughly cleaned and suitably lubricated before starting.

35.0 DOWELING: All the motors and other equipment shall be suitably doweled after alignment of shafts with tapered machined dowels as per the direction of the engineer.

36.0 CHECK OUT OF CONTROL SYSTEMS / POWER SUPPLY: After completion of wiring, cabling furnished under separate specifications and laid and terminated by the owner, the contractor shall check out the operation of all control systems for the equipment furnished and installed under these specifications and documents. The contractor shall get the drawings pertaining to the control system, power supply etc. approved from applicable agencies

37.0 COMMISSIONING SPARES: The contractor shall make arrangement for an adequate inventory at site of necessary commissioning spares prior to commissioning of the equipment furnished and erected so that any damage or loss during this commissioning activities necessitating the requirements of spares will not come in the way of timely completion of the works under the contract.

38.0 CABLING:-

38.1 All cables shall be supported by conduits or cable tray run in air or in cable channels. These shall be installed in exposed runs parallel or perpendicular to dominant surfaces with right angle turn made of symmetrical bends or fittings. When cables are run on cable trays, they shall be clamped at a minimum interval of 2000 mm or otherwise as directed by the engineer.

38.2 Each cable, whether power or control , shall be provided with a metallic or plastic of an approved type, bearing a cable reference number indicated in the cable and conduit list (prepared by the contractor),at every 5 metre run or part thereof and at both ends or the cable adjacent to the terminations. Cable routing is to be done in such a way that cables are accessible for any maintenance and for easy identification.

38.3 Sharp bending and kinking of cables shall be avoided. The minimum radii for PVC insulated cables1100 V grade shall be 15D, where D is the overall diameter of the cable. Installation of other cables like high voltage, coaxial, screened, compensating, mineral insulated shall be in accordance with the cable manufacturer's recommendations. Wherever cables cross roads and water, oil, sewage or gas lines, special care should be taken for the protection of the cables in designing the cable channels.

38.4 In each cable run some extra length shall be kept at a suitable point to enable one to two straight through joints to be made should the cable develop fault at a later date.

38.5 Control cable terminations shall be made in accordance with wiring diagrams, using identifying codes subject to engineer's approval. Multicore control cable jackets shall be removed as required to train and terminate the conductors. The cable jacket shall be left on the cable, as far as possible, to the point of the first conductor branch. The insulated conductors from which the jacket is removed shall be neatly twined in bundles and terminated. The bundles shall be firmly but not tightly tied utilising plastic or nylon ties or specially treated fungus protected cord made for this purpose. Control cable conductor insulation shall be securely and evenly cut.

38.6 The connectors for control cables shall be covered with a transparent insulating sleeve so as to prevent accidental contact with ground or adjacent terminals and shall preferably terminate Elmex terminals and washers. The insulating sleeve shall be fire resistant and shall be long enough to over-pass the conductor insulation. All control cables shall be fanned out and connection made to terminal blocks and test equipment for proper operation before cables are corded together.

SECTION-5

FORMAT FOR PRICE BID

Validate Print Help

Item Wise BoQ

Tender Inviting Authority: Tender Cell,E&M Dept.,CCL Hq,Ranchi

Name of Work:Design, Supply, Renovation, Commissioning and Testing of existing Rapid Loading System along with Associated Conveyor System with three year's extended warranty cum maintenance contract of the proposed system

NIT No:

Bidder Name :	

PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

NUMBER	TEXT #	NUMBER #	TEXT #	NUMBER #	TEXT #
Sl. No.	Item Description	Quantity	Units	TOTAL AMOUNT With Taxes	TOTAL AMOUNT In Words
1	2	3	4	8	8
1	Design, Supply, Renovation,Commissioning and Testing of existing Rapid Loading System along with associated conveyor system with extended warranty of three years after initial guaranteed/warranty of one year with spares & consumables and maintenance contract from day one of its operation. .(Total warranty 48 months)	1.000	Nos	0.00	INR Zero Only
Total in Figures				0.00	INR Zero Only
Quoted Rate in Words		**INR Zero Only**			

Service Tax Category (To Be Selected by Department)		Service Tax Category (To Be Selected by Bidder)			
Works Contract Service Category II	0.7	Bidder's Status	Total Service Tax with SBC and KKC (in Rs.)	Service Tax with SBC and KKC to be Paid By Bidder (in Rs.)	Service Tax with SBC and KKC to be Paid By CIL/Subsidiary (in Rs.)
0		Select	0	0	0
TEXT #	NUMBER #	TEXT #	NUMBER #	NUMBER #	TEXT #
Item Description	Quantity	Units	BASIC RATE In Figures To be entered by the Bidder Rs. P	TOTAL AMOUNT	TOTAL AMOUNT In Words
2	4	5	13	53	55
WORKS CONTRACT WITHOUT CENVATE CIVIL AND STRUCTURAL WORKS					
Civil foundation for additional support material as per specification,Quantity :7 Nos of additional support as per specification made from 508 mm OD seamless pipes.	1	Ls		0.00	INR Zero Only
Civil construction for pump house and intake well	1	LS		0.00	INR Zero Only
Civil construction for foundation new part of conveyor(1019 & 1028) errection.	1	LS		0.00	INR Zero Only
Civil Construction work for 4215 Substation renovation	1	LS		0.00	INR Zero Only
Civil work for CIM Rail Scale	1	LS		0.00	INR Zero Only
CGI Sheet on the existing structure of Conveyor 1019	1	LS		0.00	INR Zero Only
Sub total					
TOTAL IMPACT OF SERVICE TAX with SBC and KKC	1	LS	0.00	0.00	INR Zero Only
Sub Total with Service Tax(excluding Swachh Bharat Cess and Krishi Kalyan Cess)			0.00	0.00	INR Zero Only
WORKS CONTRACT WITH CENVATE					
Design engineering cost		LS		0.00	INR Zero Only
Erection , installation,commissioning and training of plant and machinery(mechanical items)		LS		0.00	INR Zero Only
Erection , installation,commissioning and training of plant and machinery(electrical items)		LS		0.00	INR Zero Only
Annual maintenance cost for provision of recommended technical personnel as per NIT during 3 years extended AMC period inclusive of one year guarantee period(Total warranty period of 48 months).		LS		0.00	INR Zero Only
Sub Total for B			0.00	0.00	INR Zero Only
Supply of material				0.00	INR Zero Only
Total quoted price excluding swachh bharat Cess and Krishi Kalyan Cess(1+2+3)				0.00	INR Zero Only
Total in Figures(Excluding SBC and KKC)				0.00	INR Zero Only
Swachh Bharat Cess and Krishi kalyan cess on Total Works and Services @ 1.0 %				0.00	
Total Quoted rate in Figures(Including SBC and KKC)				0.00	INR Zero Only
Quoted Rate in Words				0.00	INR Zero Only
Quoted Rate in Words	INR Zero Only				

SUPPLY OF PLANT AND MACHINERY(ELECTRICAL & MECHANICAL) AND SPARES & CONSUMABLES OF COMPREHENSIVE MAINTENANCE PERIOD

Sl. No.	Item Description	Tendered Quantity	Unit of Measure	Basic Price inclusive of all charges not specifically indicated(per unit) (in Rs.)	Excise Duty with Cess (in Rs.)	Counter Vailing Duty (CVD) with Cess	Special Additional Duty (SAD)	VAT/ CST (in Rs.)	Rate inclusive of all Taxes/ Duties (in Rs) (C+D+E+F+G)	Rate excluding Excise Duty, CVD, SAD And Cess in INR (C+G)	Amount excluding excise duty, CVD, SAD and CESS to be used for deciding the L1 bidder in INR	Amount including all taxes and duties All in INR
		A	B	C	D	E	F	G	H	I	J	K
C. PRICE BREAK UP OF PLANT &MACHINERY												
C.1.1 SUPPLY OF MECHANICAL (List of equipment)												
1.1	Conveyor 1019, 200 KW x 3 Tripple Tandem Drive with Drive Head, Tail End with pulley, Take up Pulley, Discharge Pulley, Snub/Bend Pulley,counter weight,belt sway switch,pull cord switch,zero speed switch , Starter & Audio Visual alarm etc	1	Set						0.00	0.00	0	0
1.2	Conveyor 1019 1600 mm with New structure,Stringer, Stool, Base plate, bolt nut, Idlers and Return rollers etc : 171 meter	171	Meter						0.00	0.00	0	0
1.3	Remaining part of Conveyor 1019 with Idlers and Return rollers and roller bracket : 185.73 meter.	185.73	Meter									
1.4	Additional support material as per specification, Quantity : 7 nos. of additional support as per specification made from 508 mm OD seamless pipes of total length 411 meter inclusive of Foundation Plate 30 MM,M 36 Bolt with Nut and Washer,Top structure above Pipe for supporting Conveyor Structure, Additional guard below conveyor structure at Road Crossing near SILO,	1	lot						0.00	0.00	0	0
1.5	a)160 Nos of New Walkway frame for 1019 Conveyor and 52 Nos for 1028 Conveyor. Each frame having dimension of 315 cm length and 70 cm width will be made from 3.2 cm width x 0.50 mm thickness MS strips/(In a walkway frame the No. of horizontal strips is 70 . and no. of longitudnal strips is 10).b)Walkway plateform of Sampling station c) walkway platform of SILO complex	39.864	Te						0.00	0.00	0	0
1.6	1600 mm Steel Cord Belting ST-1120 for 1019 Conveyor.	750	Meter						0.00	0.00	0	0
1.7	Dust suppression and cleaning system for both Conveyor & Silo Consist of 02 sets pump, 100 meter head, main delivery pipe of approximate length 875 meter and 1" delivery pipes with provision of water jets at 50 meter interval of entire length of conveyors 1019 and 1028.	1	LS						0.00	0.00	0	0
1.8	Complete accessories for supply of erection of Lift, Quantity : 02 nos. (01 no. 408 Kg and 01 no. 1500 Kg), including installation & commissioning.	2	Set						0.00	0.00	0	0
1.9	Automatic sampling equipment as per specification.	1	Set						0.00	0.00	0	0
1.10	Fire fighting & fire detection system as per technical specification.	1	Lot						0.00	0.00	0	0
1.11	Conveyor 1028, 280 KW single (1400 mm) Drive with Drive Head, Tail End with pulley, Take up Pulley, Discharge Pulley, Snub/Bend Pulley,counter weight,belt sway switch,pull cord switch,zero speed switch , Starter & Audio Visual alarm etc	1	Set						0.00	0.00	0	0
1.12	Conveyor 1028 1400 mm with **New structure,Stringer, Stool, Base plate, bolt nut, Idlers and Return rollers etc : 412 meter**	412	Meter						0.00	0.00	0	0
1.13	Remaining part of Conveyor 1028 with **Idlers and Return rollers and roller bracket : 82 meter.**	82	Meter									
1.14	1400 mm PN/EP Belting, 5 Ply, FRAS Grade, 6/3 cover, moulded edge, Syn BR for **1028 Convetor**	1050	Meter						0.00	0.00	0	0
1.15	Belt weigher at conveyor 1019	1	Set						0.00	0.00	0	0
1.16	Rapid loading system along with all accessories except Weigh Bin	1	Set						0.00	0.00	0	0
1.17	Supply of Red oxide paint and Anti corressive paint.	1000	ltr						0.00	0.00	0	0
1.18	CIM Rail scale for giving Feedback of Tare weight of Wagon to RLS system.	1	Set						0.00	0.00	0	0
1.19	Misc. equipment,tools and tackles,safety items,accessories and facilities	1	Lot						0.00	0.00	0	0
1.20	Any other item required for completion of the entire mechanical system but not specifically mentioned	1	Lot						0.00	0.00	0	0
SUB TOTAL C1.1											0	0
C.1.2 SUPPLY OF ELECTRICAL (List of equipment)												
2.1	1.5 MVA,11kV/3.3kV, Power Transformer for 4214 substation	1	Nos						0.00	0.00	0	0
2.2	750 KVA, 11 KV/415V Transformer unit with all Primary & Secondary control at 4215 substation.	2	Nos						0.00	0.00	0	0
2.3	3.3 KV grade, 35 Sq.mm, PVC mining type Cu Cable from 4214 sub-station to 3 No motors at 1019 drive station and 1No motor at 1028 drive station. As per original designed Electrical Layout.	650	Meter						0.00	0.00	0	0
2.4	3.3 KV grade, 35 Sq. mm, three core, Cu Cable (flexible) from LCS to Motors of 1019 and 1028. As per original designed Electrical Layout.	100	Meter						0.00	0.00	0	0
2.5	1.1 KV grade, 50 Sq. mm, Voltage : 415 V, 3 core, Cu PVC armoured mining type cable.	205	Meter						0.00	0.00	0	0
2.6	1.1 KV grade, 25 Sq. mm, Voltage : 415 V, 3 core, Cu Flexible cable.	10	Meter						0.00	0.00	0	0
2.7	1.1 KV grade, 16 Sq. mm, Voltage : 415 V, 3 core, Cu PVC armoured mining type cable.	200	Meter						0.00	0.00	0	0
2.8	1.1 KV grade, 4 Sq. mm, Voltage : 415 V, 3 core, Cu PVC armoured mining type cable.	1235	Meter						0.00	0.00	0	0
2.9	1.1 KV grade, 4 Sq. mm, Voltage : 415 V, 3 core, Cu Flexible cable.	60	Meter						0.00	0.00	0	0
2.10	Control cables PVC armoured, Cu, Voltage/Grade : 1.1 KV / 110 AC for automatic sampling station as per original design specification. Cables size 1.5 Sq. mm, Cores: 24 C+E.	885	Meter						0.00	0.00	0	0
2.11	Control cables PVC armoured, Cu, Voltage/Grade : 1.1 KV / 110 AV for automatic sampling station as per original design specification. Cables size 1.5 Sq. mm, Cores: 10 C+E.	610	Meter						0.00	0.00	0	0

2.12	Control cables PVC armoured, Cu, Voltage/Grade : 1.1 KV / 110 ACfor automatic sampling station as per original design specification. Cables size 1.5 Sq. mm, Cores: 16 C+E.	60	Meter						0.00	0.00	0	0
2.13	Control cables PVC armoured, Cu, Voltage/Grade : 1.1 KV / 110 AC for automatic sampling station as per original design specification. Cables size 1.5 Sq. mm, Cores: 2 C+E.	6125	Meter						0.00	0.00	0	0
2.14	Control cables PVC armoured, Cu, Voltage/Grade : 24 V / 150 V DC for automatic sampling station as per original design specification. Cables size 1.5 Sq. mm, Cores: 1 PR + Screen.	850	Meter						0.00	0.00	0	0
2.15	Control cables PVC armoured, Cu, Voltage/Grade : 1.1 KV / 110 AC for automatic sampling station as per original design specification. Cables size 1.5 Sq. mm, Cores: 3 C+E.	222	Meter						0.00	0.00	0	0
2.16	Control cables PVC armoured, Cu, Voltage/Grade : 1.1 KV / 110 AC for automatic sampling station as per original design specification. Cables size 1.5 Sq. mm, Cores: 4 C+E.	815	Meter						0.00	0.00	0	0
2.17	Sprecher + Schuh make Motor protection Relay EMPR / Static, CET-3, AC11 - 220 V, 3 A, DC11 - 220 V, 0.07 A.	3	Nos						0.00	0.00	0	0
2.18	Complete Breaker unit of TOSHIBA make VCB Panel type UV3GAM insulation valotage: 3.6 KV, Operating voltage :3.3 KV, Current : 200 A, PT Ratio: 3.3 KV / 110 V, Fuse : PFC3., Control Voltage: AC 110 V.	3	Nos						0.00	0.00	0	0
2.19	1.5 Ton Air conditioners with voltage stabilizers as required for control room at Silo, 4214 Sub-station and 4215 Sub-station.	3	Set						0.00	0.00	0	0
2.20	Suitable communication system to be provided in RLS operator's cabin to communicate with different key locations as explained separately. Minimum 10 liner automatic exchange.	1							0.00	0.00	0	0
2.21	Illumination system complete with Lighting distnbution boards ,Lighting fixtures, luminaires,Two no of 100kVA,415/230V lighting Transformer , one no of Telescopic Tilting movable lighting tower of 18 mtr height with 08 Nos 1X 400W HPSV Flood light etc. as required. Location : SILO complex(Interior & Exterior) ,1019& 1028 conveyor galleries , Transfer station 1106 &1107, Sampling station	1	Lot						0.00	0.00	0	0
2.22	415 volts Motor Control Centre at the proposed plant for power receipt and distribution to all electrical dnes with all necessry control and protective devices.	1	Set						0.00	0.00	0	0
2.23	PLC Microprocessor based control system including control Desk, Sensor, Loading Control Console, Push button stations etc. Two nos. belt conveyors, auto sampler and RLS etc are also to be interfaced with the existing PLC system.	1	Lot						0.00	0.00	0	0
2.24	Welding system	1	Lot						0.00	0.00	0	0
2.25	Cable trays/cable racks,cable trenches & cable vaults etc.	1	Lot						0.00	0.00	0	0
2.26	Control Transformers of required capacity complete with voltage stablizers rectifier and all accessories	1	Lot						0.00	0.00	0	0
2.27	Earthing system complete with earth pits,earthing strips, conductors etc	1	Lot						0.00	0.00	0	0
2.28	Lightning Protection system for SILO	1	Lot						0.00	0.00	0	0
2.29	Computer and Printers, Laptops, UPS and Software etc.	1	Lot						0.00	0.00	0	0
2.30	UPS system with redundancy complete with batteries, protective and other accessories.	1	Set						0.00	0.00	0	0
2.31	EOT crane capacity - 5 MT with electricals (for 1107 transfer station)	1	Set						0.00	0.00	0	0
2.32	11 kV grade,70Sqmm, Cu mining Cable from O/H line to trans switch unit Primary of 4215 substation	100	Meter						0.00	0.00	0	0
2.33	Any other item required for completion of the entire electrical system but not mentioned	1							0.00	0.00	0	0
SUB TOTAL C.1.2											0	0
C.1.3 Consumables for 1st year												
3.1	1st year consumable for electrical	1	Lot						0.00	0.00	0	0
3.2	1st year consumable for mechanical	1	Lot						0.00	0.00	0	0
3.3	First fill Oils, Greese & Lubricants	1	Lot						0.00	0.00	0	0
3.4	Any other spares/tools/testing equipment reqd. but not specifically mentioned	1	Lot						0.00	0.00	0	0
SUB TOTAL C.1.3											0	0
C.1.4 COMPREHENSIVE ANNUAL MAINTENANCE												
4.1	**Consumables for 2nd year of maintenance**	1	Lot						0.00	0.00	0	0
4.2	**spares for 2nd year of maintenance**	1	Lot						0.00	0.00	0	0
4.3	**Consumables for 3rd year of maintenance**	1	Lot						0.00	0.00	0	0
4.4	**spares for 3rd year of maintenance**	1	Lot						0.00	0.00	0	0
4.5	**Consumables for 4th year of maintenance**	1	Lot						0.00	0.00	0	0
4.6	**spares for 4th year of maintenance**	1	Lot						0.00	0.00	0	0
SUB TOTAL C.1.4											0	0
TOTAL = C.1.1 + C1.2+C.1.3+C1.4											**0.00**	**0.00**

Tender Inviting Authority: Tender Cell,E&M Dept, CCL HQ,Ranchi

Name of Work: Design, Supply, Renovation, Commissioning and Testing of existing Rapid Loading System along with Associated Conveyor System with three year's extended warranty cum maintenance contract of the proposed system

NIT NO :

Bidder Name :	**0**

Weight & Volume for Civil and Structural Works

Sl. No.	Item Description	Unit	Quantity
1	Civil Foundation for Additional support material as per specification,Quantity: 7 nos. of additional support as per specification made from 508 mm OD seamless pipes.	Lot	
	(a) RCC excluding reinforce	Cum	
	(b) Reinforced Bar in RCC work	MT	
2	Civil Construction for Pump House and Intake well	Lot	
	(a) RCC excluding reinforce	Cum	
	(b) Reinforced Bar in RCC work	MT	
3	Civil Construction for foundation new part of Conveyor (1019 & 1028) erection.	Lot	
	(a) RCC excluding reinforce	Cum	
	(b) Reinforced Bar in RCC work	MT	
4	Civil Contruction work for 4215 Sub-station rennovation.	Lot	
	(a) RCC excluding reinforce	Cum	
	(b) Reinforced Bar in RCC work	MT	
5	CGI sheet on the existing structure of conveyor 1019	MT	

NOTE:-

(1) Quantity should be as per scope defined in the tender document and should cover all the requirement of the system.

(2) ±10% Clause: Based on civil and structural quantities of works as given by the bidder in the above table, the shortfall in total quantity of all civil & structural works shall be allowed up to 10% only to every individual items. For shortfall of quantities exceeding 10%, there shall be proportional reduction in the price of the individual items resulting in the reduction in the award value by the same amount. Upward variation in quantity of individual items for civil & structural works should be absorbed by contractor unless specifically stated otherwise in the document.

(3) The above items of work are to be executed strictly as per IS provisions.

SECTION 6

MISCELLANOUS FORMS

PERFORMA FOR MOBISILATION ADVANCE

PERFORMANCE GUARANTEE

FORMAT FOR CONTRACT AGREEMENT

FORMAT FOR INTEGRITY PACT

SA MONITORING

JV/CONSORTIUM AGREEMENT

BANK GUARANTEE PROFORMA FOR MOBILISATION ADVANCE

(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT)
(TO BE ISSUED BY ANY NATIONALISED/ SCHEDULEDBANK AUTHORISED BY RBI TO ISSUE A BANK GUARANTEE)

To:
Central Coalfields Limited,
Darbhanga House
Dist. : Ranchi(Jharkhand)
Pin-834001

In consideration of the Central Coalfields Limited, having its Registered office at Darbhanga House, Dist. Ranchi(Jharkhand) (hereinafter called to as the "Employer" which expression shall unless repugnant to the context or meaning thereof, include all successors, administrators and assigns) having awarded to _____ *[Name & Address of the Contractor]* (hereinafter called to as "Contractor" which expression shall unless repugnant to the context of meaning thereof include its successors, administrators, executors and assigns) the work _____ *[Name of the Work]*
by issue of Letter of Award No. _____ *[Work Order/Letter on Intent No.]* and the same having
been unequivocally accepted by the Contractor resulting into a Contract Agreement dated _____ valued at _____*[value of Work Order]* (hereinafter called 'the Contract')
and the Employer having agreed to make a Mobilisation Advance payment with interest to the Contractor amounting to _____ *[Amount of guarantee in words and figures)]* for execution of the said Contract as an advance against Bank Guarantee of equivalent amount furnished by the Contractor.

We, _____ *[Name of the Bank]* of _____ *[address of the Bank]* (hereinafter called to as 'the Bank' which expression shall unless repugnant to the context of meaning thereof, include all successors, administrators and assigns) do hereby undertake to pay to the said Employer on demand an amount not exceeding _____ *[amount of guarantee in words and figures]* against any loss or damage caused to or suffered or would be caused to or suffered by the said Employer by reasons of any breach by the said Contractor of any terms and conditions contained in the said Contract without any demure reservation, recourse, contest or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the Bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any court, tribunal, arbitrator or any other authority. We agree that the guarantee herein contained shall be irrevocable and shall continue to be enforceable till the advance amount is liquidated.

The Employer shall have the fullest liberty without affecting in way the liability of the Bank under this Guarantee from time to time to vary the advance or to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty without affecting this Guarantee to postpone from time to time the exercise of any powers vested in them or of any right

which they might have against the Contractor and the exercise the same at any time in any manner and either to enforce or to forebear or to enforce any covenants contained or implied in the Contract, between the Employer and the Contractor or any other course or remedy or security available to the Employer. The Bank shall not be released of its obligations under these presents by an exercise by the Employer of its liberty with reference to matter aforesaid or any of them or by reason of any other act of forbearance or any of them or by reason of any other act of forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving the Bank. The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a Principal debtor in first instance, without proceeding against the Contractor and not withstanding any security or other Guarantee that the Employer may have in relation to the Contractor's liabilities.

Dated this _____ day of _____ at _____
For and on behalf of the Bank.
Signature _____
Name _____
Designation _____
Common Seal of Bank _____

BANK GUARANTEE PROFORMA FOR PERFORMANCE SECURITY/GUARANTEE

(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT)
(TO BE ISSUED BY ANY NATIONALISED/ SCHEDULEDBANK AUTHORISED BY RBI TO ISSUE A BANK GUARANTEE)

To:
Central Coalfields Limited,
Darbhanga House
Dist. : Ranchi(Jharkhand)
Pin-834001

In consideration of the Central Coalfields Limited, having its Registered office at Darbhanga Houe , Dist. Ranchi(Jharkhand) (hereinafter called to as the "Employer" which expression shall unless repugnant to the context or meaning thereof, include all successors, administrators and assigns) having awarded to_____ *[Name & Address of the Contractor]* (hereinafter called to as "Contractor" which expression shall unless repugnant to the context of meaning thereof include its successors, administrators, executors and assigns) the work _____ *[Name of the Work]* by issue of Letter of Award No. _____ *[Work Order/Letter of Intent No.]* and the same having been unequivocally accepted by the Contractor resulting into a Contract Agreement dated _____valued at _____ *[value of Work Order]* (hereinafter called 'the Contract') and the Employer having agreed to accept Performance Bank Guarantee of ___ *[indicate figure]%* of the Contract Sum _____ *[amount in figures and words)* from a Nationalized/Scheduled Bank for due performance of the work executed by the Contractor as per the terms & conditions contained in the said Contract.

We, _____ *[name of the Bank]*, of _____ *[address of the Bank]* (hereinafter called to as "Bank" which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer immediately on demand and or, all money payable by the Contractor tothe extent of _____ *[amount of guarantee in figures and words]*, at any time from_____ to _____ without any demur, reservation, recourse, contest or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the Bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. We agree that the Guarantee herein contained shall be irrecoverable and shall continue to be enforceable as per the terms & conditions contained in the said Contract.

The Employer shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee, from time to time, to extend the validity of time of Performance of the Contract by the Contractor. The Employer shall have the fullest liberty without affecting this Guarantee, to postpone, from time to time, the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forebear or to enforce any covenants contained or implied in the Contract, between the Employer and the Contractor or any other course or remedy or security available to the Employer. The Bank shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to matter aforesaid or any of them or by reason of any other act of forbearance or other acts of omission or commission on the part of the

Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving the Bank. The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a Principal Debtor in first instance, without proceeding against the Contractor and notwithstanding any security or other Guarantee that the Employer may have in relation to the Contractor's liabilities.

Dated this _____day of _____ at _____
For and on behalf of the Bank.
Signature _____
Name _____
Designation _____
Common Seal of Bank _____

FORMAT FOR CONTRACT AGREEMENT

(On Non- Judicial Stamp Paper)
Agreement No.
Dated:
THIS ARTICLE OF AGREEMENT made on this _____day of _____ 20_ between the Central
Coalfields Limited, a Employer registered under the Indian Companies Act. 1956 with its registered office at Ranchi and a Subsidiary of Coal India Limited, Govt. of India Undertaking, P.O. Ranchi(Pin-834001) Dist. :
Ranchi(Jharkhand), (hereinafter referred to as the Employer which expression where the context so admit shall include its successors in interest and assign) of the one Part and _____ (herein after referred to as "the Contractor" which expression where the context so admit shall include its heirs, executors, administrators legal representatives, successors in business and assign) of the other part.

WHEREAS, the Employer invited bid for the Work "_____"and the bid of the
Contractor has been accepted by the Employer vide their Letter No
_____ dt. _____ for a sum of
_____ *[Contract sum in figure & words]*

WHEREAS the Contractor has agreed to execute the works on the terms & conditions as stipulated in the Bid and subsequent amendments thereto for a sum of _____ *[Contract sum infigure & words]* for successful completion of the work.

NOW THIS AGREEMENT WITNESSETH AND IT IS HEREBY AGREED AS FOLLOWS:

1. In pursuance of the Agreement aforesaid and in consideration for the payment of the sum of _____ [*Contract sum in figure & words]* and/or such sum as may be payable to the contractor, the Contractor shall upon and subject to the said terms & conditions execute and complete the work shown upon in the said drawings and described in the said scope of work as provided for in the said conditions.

2. The time shall be considered as one of the essence of the contract and time for completion of the contract shall be 24 (twenty-four) months from the date of commencement of work.
3. The parties hereto shall respectively and faithfully abide by and submit themselves to the terms & conditions and stipulations contained in this agreement and perform and discharge their part of contract accordingly.

4. This final Agreement has been arrived at between the parties after due consideration of the correspondences, documents, meetings and negotiations held from time to time. The following

documents shall constitute the Contract between the Employer and the Contractor. And each shall be read and construed as an integral part of the Contract.

Part Description of Documents:-

01. Article of Agreement.
02. Detailed Bid Notice.
03. Notification of Award
04. The Bid and Prices Schedules submitted by the Contractor
05. Conditions of Contract
06. Financial terms and conditions
07. Billing Schedule
08. Technical Specifications and drawings
09. Any Other Documents

5. The Contract shall be executed within the purview of the Indian Laws. In witness whereof the parties hereto have hereunder affixed their signatures at Ranchi on the day, month and year written as above.

SIGNED, SEALED AND DELIVERED

Signed on behalf of the Contractor	Signed on behalf of the Employer
Designation	Designation Central Coalfields Limited
Darbhanga House, Dist. :	Ranchi(Jharkhand)
WITNESS - 1 (Signature) (Name in Block Letters) Official Address: WITNESS - 2 (Signature) (Name in Block Letters) Official Address:	WITNESS - 1 (Signature) (Name in Block Letters) Official Address: WITNESS - 2 (Signature) (Name in Block Letters) Official Address:

(The latest format may be used during signing in consultation with CCL)
(Refer to Clause 3.3(p) and 3.8 of Section-2)
[Instructions: Bidders are advised to upload/submit the Integrity Pact document duly signed, stamped and accepted on each page mentioning the Tender No. and date.]

INTEGRITY PACT

Between
Central Coalfields Limited (CCL) hereinafter referred to as "The Principal",
And
…… hereinafter referred to as "The Bidder/ Contractor"

Preamble

The principal intends to award, under laid down organizational procedures, contract/s for..... The Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness / transparency in its relations with its Bidder(s) and / or contractor(s).

In order to achieve these goals, the Principal will appoint an Independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 - Commitments of the Principal:-

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

(a) No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

(b) The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

(c) The Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the LPC/ PC Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s) :-

(1) The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

(a) The Bidder(s) / Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

(b) The Bidder(s)/ Contractor(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

(c) The Bidder(s)/ Contractor(s) will not commit any offence under the relevant IPC / PC Act: further the Bidder(s)/Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

(d) The Bidder(s)/ Contractor(s) of foreign origin shall disclose the name and address of the Agents/ representatives in India, if any. Similarly the Bidder(s)/ Contractors (s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/ Contractor(s). Further, as mentioned in the Guidelines all the payments made to the Indian agent/ representative have to be in Indian Rupees only. Copy of the "Guidelines on Indian Agents of Foreign Suppliers" is annexed and marked as Annex. - "A".

(e) The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

(2) The Bidder(s) / Contractor(s) will not instigate third persons to commit offences outlined above or be an necessary to such offences.

Section 3 - Disqualification from tender process and exclusion from future contracts.

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the procedure mentioned in the "Guidelines on Banning of business dealings". Copy of the "Guidelines on Banning of business dealings" is annexed and marked as Annex - "B".

Section 4 - Compensation for Damages:

(1) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit / Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the Contract value or the amount equivalent to Performance Bank Guarantee.

Section 5 - Previous transgression:
(1) The Bidder declares that no previous transgressions occurred in the last 3 years with any other Company in any country conforming to the anti corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or action can be taken as per the procedure mentioned in "Guidelines on Banning of business dealings".

Section 6 - Equal treatment of all Bidders / Contractors / Sub-contractors

(1) The Bidder(s)/ Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

(2) The Principal will enter into agreements with identical conditions as this one with all Bidders, Contractors and Subcontractors.

(3) The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7 - Criminal charges against violating Bidder(s)/Contractor(s)/ Subcontractor(s)

If the principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Section 8 - Independent External Monitor / Monitors

(1) The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

(2) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, CCL.

(3) The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project Monitor is under contractual obligation to treat

the information and documents of the Bidder(s)/ Contractor(s) Subcontractor(s) with confidentiality.

(4) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

(5) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

(6) The Monitor will submit a written report to the CMD, CCL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should be occasion arise; submit proposals for correcting problematic situations.

(7) Monitor shall be entitled to compensation on the same terms as being extended to / provided to Independent Directors on the CCL Board.

(8) If the Monitor has reported to the CMD, CCL a substantiated suspicion of an offence under relevant IPC/ PC Act, and the CMD, CCL has not, with in the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

(9) The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

The Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded.

If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by CMD of CCL.

Section 10 - Other Provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Ranchi

(2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

(3) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

(4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(For & on behalf of the Principal) (For & On behalf of Bidder/Contractor)
(Office Seal) (Office Seal)
Place.....
Date.....
Witness 1:
(Name & Address) .....
.....
.....
.....
Witness 2:
(Name & Address) .....
.....
.....
.....
Names and addresses of the Independent External Monitors for operation of the Integrity Pact with CCL:

1.Sh Chaman Kumar, IAS(Retd.)
Bunglow No.80
New Motibagh, New Delhi-110023

2.Sh. B.P Nilaratna, IAS(Retd,)
D-II/15,Pandara Road, New Delhi-110003

Annex – "A"
"Guidelines on Indian Agents of Foreign Suppliers"

The following documents are required to be submitted along with the quotation in case the offer by foreign principal involving Indian Agent.

i) Foreign Principal's Performa invoice or any other authentic documents indicating the commission payable to the Indian Agent, nature of after Sales Service to be rendered by the Indian Agent & precise relationship between the principal and agent and their mutual interest need to be sated/submitted.

ii) Copy of the agency agreement, if any, with the foreign principal stating the precise relationship between them and their mutual interest in the business need to be submitted.

iii) In case the items to be ordered fall under the restricted list of current Export Import Policy of Govt. of India, the enlistment of the Indian agent with Director General of Supplies & Disposal, New Delhi under Compulsory Registration Scheme of Ministry of Finance, need to be submitted.

Annex – "B"

"Guidelines on Banning of business dealings"

i) If the performance of any supplier is found to be unsatisfactory, or if the conduct of the supplier (firm) is under suspicion, or in the event of any breach of the conditions as stipulated in the general terms and conditions of the supply contract, committed by the supplier or a partner of the supplier, the competent authority (CMD of the Subsidiary Company/D(T), CIL as the case may be) may consider whether such default on the part of the supplier, consequence of breach of allegations are of a serious nature and whether pending full examination /investigation, it would be advisable to continue business dealing with the firm. If the competent authority decides that it would not be in the interest of the Company to continue such business, pending full investigation/examination, it may suspend business dealing with the firm. The order of suspension should specify whether all subsisting contracts/ supplies are suspended or whether the order relates to specific Contracts/supplies. The order of suspension would operate for a period of not more than six months unless withdrawn earlier. The competent authority of the Subsidiary Company/CIL may suspended the entire business dealings covered under the existing contract in whole or any part thereof any time by giving the supplier notice in writing of such effect and the anticipated duration of such suspension, as per the relevant clauses, sub clauses of the general terms & conditions of supply of stores of contract. The concerned department of subsidiary Company/CIL should ensure that the final examination/ investigation of the case is completed well within a period of six months or within the anticipated duration of suspension order notified to the supplier firm whichever is earlier.

ii) After full investigation of the matter is completed, the subsidiary company/CIL will take the following action:

(a) If the facts and evidence justify any penal action against the firm as detailed at point iv) below, such action should be taken.

(b) Otherwise, the suspension order should be revoked forthwith, under intimation to all concerned.

iii) For further actions the relevant stipulations contained in the relevant clauses of the General terms & conditions of supply of stores of the supply order/contract will prevail upon.

i) Banning of Business- Banning of Business shall be considered in the following cases.

a) If the Directors, Proprietors, Employees, Partners of any Representative of the firm is/are found guilty of offences involving any security consideration including loyalty to the State, in connection with business dealings with CIL or its Subsidiaries.

b) If the Director, Proprietor or Partner, Manager or any Representative of the firm is convicted by a court of law for offences in relation to its business dealing with any State Government/ Central Government or any Public Sector Undertaking.

c) If there are strong reasons to believe that the Director, Proprietor or Partner, Manager or any Representative of the firm has/have been guilty of malpractices such as bribery. Corruption, fraud, substitution of tenders, interpolation, etc.

d) Wilful suppression of facts or furnishing or wrong information or manipulated or forged documents by the firm or using any other illegal/unfair means.

e) Drawing double payment or submitting invoice for double payment for the supply of same materials or carrying out the same job/work.

f) Supplying defective materials and failure to replace the defective materials even after reasonable extension is given to the firm for rectification/replacement of the defective materials or carrying out defective/poor quality job, not conforming to specifications of the contract and failure to rectify it within stipulated time.

g) Failure to pay legitimate dues to CIL/Subsidiary companies including dues arising out of Risk Purchase and when CIL and/or its subsidiary companies are satisfied that this is not due to any reasonable dispute which would attract proceedings in arbitration or a Court of Law.

h) Commission of economic offence like evasion of Excise Duty, sales tax, customs Duty, or any other legitimate taxes, levies, duties etc. imposes by the Government or local authorities etc.

i)Continued and repeated failure to meet contractual obligations.

j) Revision of price and terms of offer within the validity period of the tender on a habitual basis, in order to undermine the decision making process.

k) Canvassing and lobbying to get undue favour from the company.

l) Formation of price cartels with other suppliers/contractors with a view to artificially hiking the prices.

m) Any misses, which may cause financial loss or commercial disadvantage to The Company

CENTRAL COALFIELDS LIMITED
RANCHI

SA MONITORING OF SUPPLIERS/SUBCONTRACTORS

Project/Unit/Hq-department……
Name of Supplier/Subcontractor: …… Date of Monitoring……

1: Child Labour & Young Workers.
a. No Child Labour has been engaged.
b. No Young Worker has been engaged which was avoidable.
c. If engaged, there is no violation of NCL's Young Workers policy.
d. No work-activity of own operations is hazardous/unsafe to the health & development of Children & Young persons.

2: Forced Labour.
a. No unwilling person as been engaged through any force.
b. No deposits or personal documents have been kept in lieu of employment.
c. No wage, benefit, or personal documents have been withheld to force an employee to continue his/her employment.
d. Right of employees has not been restricted to leave workplace after duty hours, and to leave employment with due notice.

3: Safe and healthy work environment.
a. Workplaces under own control are safe and healthy as per applicable norms.
b. Required health & safety instructions are regularly given to employees.
c. Suitable systems are in place to detect, avoid, or respond to potential threats to health & safely in workplaces under own control.
d. Written records of all occurred accidents in places under own control is maintained.
e. Contractually required PPE are provided to employees.
f. Contractually required first-aid and follow-up medical treatment provided to injured employees.
g. Female workers are not exposed to risk their childbearing capabilities?
h. Clean toilets, potable water, and hygienic food storage facility are available for employees.
i. Dormitory or equivalent facilities, if provided, are clean, safe, and meet basic needs of occupants.
j. Right of employees is not restricted to leave workplace without seeking permission from anyone if they see imminent serious danger.

4. Freedom of union/association activities.
a. Right of employees to form union/association as per law is honoured, and no one is discriminated or penalized for this.
b. Employees/workers are free to elect their representatives as per law.

c. Right of elected workers representatives is not restricted for free access to their members as per law. And they are not subjected to discrimination, harassment or retaliation for this.

5. Social and personal equality of employees.

a. No one is discriminated for employment, remuneration, and service facilities-based on his/her ethnic/social origin, cast, birth, religion, disability, gender, sexual orientation, family responsibilities, marital status, union/association membership, political opinion, age etc- if otherwise fit and/or suitable.

b. No employee is interfered to observe his/her tenets/practices, or obligations of his/her ethnic/social origin, religion, disability, gender, sexual orientation, family responsibilities, union/association membership, political opinion etc.

c. Employees are not allowed of any behavior (including gestures, language, and physical contact) that is threatening, abusive, exploitative, or sexually coercive-at workplace and at provided residential facility like dormitory etc.

d. Employees are not subjected to pregnancy test or virginity test.

6. Dignity of employees.

a. All employees are treated with due dignity and respect.

b. No employee is subjected to corporal punishment, mental or physical coercion, verbal abuse, or harsh or inhuman treatment.

7. Reasonable working hours.

a. Declared working hours of employees (including weekly-offs and holidays) are in compliance with the applicable rules.

b. All overtime work is either voluntary by the concerned employee, or through an agreement with workers union/association/representative.

8. Proper remuneration.

a. All employees are paid their legal wages/pays as per payment protocol set by CCL.

b. Wage/pay of any employee is not deducted for disciplinary purpose, unless permitted by law and agreed by employee unions/associations.

c. All earnings and deductions of employees are clearly detailed under salary/wage sheets: and payments are made to employees as per scheduled arrangement.

d. All overtime work is paid at a premium rate as per the applicable law.

e. All applicable labour and social security obligations (eg. PF) are fulfilled for all employees.

f. Applicable obligations for labour and social security are not circumvented in any manner.

PROFORMA OF JOINT VENTURE /CONSORTIUM AGREEMENT

(On Non-Judicial Stamp paper of appropriate value as per provision of the Stamp Act applicable in the concerned state)

This Joint Venture /Consortium agreement is made on this ……..day of……..

AMONGST/BETWEEN

M/s……, having its registered Office at ……...

Represented by Shri…….(Name and Designation) of M/s……...Who has power of Attorney to enter into Joint Venture /Consortium with……...and

Sign all documents/ agreements on behalf of M/s…… (hereinafter referred to as"…….")

AND

M/s……, having its registered Office at ……...

Represented by Shri…….(Name and Designation) of M/s……...who has power of Attorney to enter into Joint Venture /Consortium with……...and

Sign all documents/agreements on behalf of M/s…… (hereinafter referred to as"…….").

AND

M/s……, having its registered Office at ……...

Represented by Shri…….(Name and Designation) of M/s……...who has power of Attorney to enter into Joint Venture /Consortium with……...and

Sign all documents/agreements on behalf of M/s…… (hereinafter referred to as"…….").

The expressions M/s ……..and M/s……and M/s……...Shall, wherever the context admits, mean and include their respective legal representatives, successors-in-interest and assigns and shall collectively be referred to as "Joint Venture /Consortium/Parties" and individually as "Joint Venture /Consortium Partner/Party".

WHEREAS M/s…….and M/s……and M/s ……agreed to form a Joint Venture /Consortium in order to join their forces to obtain best results from the combinations of their individual resources of technical and management skill, finance and equipment for the benefit of the project and in order to submit the Bid for the work of "…….....

…… …….. (hereinafter referred to as "Project") under……..(Name of Company(hereinafter referred to as "the principle Employer").

The Parties hereby enter into this Joint Venture /Consortium Agreement (hereinafter referred to as "Joint Venture /Consortium Agreement") to jointly prepare and submit the Bid for the Project and in the event of securing the Project from the Employer, to execute the Project in accordance with the Contract terms and conditions, to the satisfaction of the Principal Employer.

NOW THEREFORE, the parties, in consideration of the mutual premises contained herein, agree as follows:

1) **FORMATION AND TERMINATION OF THE JOINT VENTURE /CONSORTIUM**.

The parties under this Agreement have decided to form a Joint Venture /Consortium to submit the Bid for the above Project and execute the Contract with the Principal Employer for the Project, if qualified and awarded.

a) The name and style of the Joint Venture /Consortium shall be "……..."

(hereinafter called the "Joint Venture /Consortium"

b) The Head Office of the Joint Venture /Consortium shall be located at……. and the site office will be located at the site of the Project. All communication regarding the project will be made to…… Telephone Nos……..

c) None of the parties of the Joint Venture /Consortium shall be allowed to assign, pledge, sell or otherwise dispose all or part of its respective interests in the Joint Venture /Consortium to any party including the existing partner of the Joint Venture /Consortium.

d) The term of the Joint Venture/Consortium shall begin as on the date first set forth above and shall terminate on the earliest of the following dates.

i) The Joint Venture /Consortium fails to obtain qualification from the Employer.
ii) The Contract for the Project is not awarded to the Joint Venture /Consortium.
iii) The Employer cancels the Project
iv) Either Party commits material breach of this Agreement and fails to cure such breach within the period designated by the non-defaulting Party
v) Both parties agree to terminate this Agreement in writing.
vi) The Project is completed including defects liability period to the satisfaction of the Employer and all the parties complete any and all duties, liabilities and responsibilities under or in connection with the Contract and the Joint Venture /Consortium Agreement.

2) LEAD PARTNER.

M/s……. shall be the Lead Partner of the Joint Venture /Consortium and is responsible for performing a key function in contract management. M/s……. shall be attorney of the parties duly authorized to incur liabilities and receive instructions for and on behalf of any and all partners in the Joint Venture /Consortium and also all the partners of the Joint Venture /Consortium shall be jointly and severally liable during the bidding process and for the execution of the contract as per contract terms with the employer in accordance with the power of attorney annexed. All Joint Venture /Consortium partners M/s…….. & M/s…….. nominate and authorize Shri……. (name and designation) of M/s…… to sign all letters, correspondence, papers & certificates

and to submit the Pre-qualification Application / Bid documents for and on behalf of the Joint Venture

/Consortium.

3) REPRESENTATIVE OF THE PARTNERS OF THE JOINT VENTURE /CONSORTIUM.

Each constituent party of the Joint Venture /Consortium appoints the following personnel as the representative of the relevant party with full power of attorney from the Board of Directors of the concerned company.

JV / CONSORTIUM Partner	Name	Position in the respective Company
M/s……	…….	……
M/s…….	……..	……
M/s…….	……..	……

4) PARTICIPATION SHARE & WORK RESPONSIBILITIES.

4.1 The parties agree that their respective participation share (hereinafter called „Participation Share") in the Joint Venture /Consortium shall be as follows:

M/s…….. : ……..…..% (……..per cent)
M/s…….. : ……..…..% (……..per cent)
and M/s…….. : …...% (……..per cent)

4.2 The Parties shall share the rights and obligations, risk, cost and expenses, working capitals, profits or losses or others arising out of or in relation to execution of the Project in proportion to their share of participation in the Joint Venture /Consortium except as otherwise agreed.

4.3 The parties shall jointly execute the works under the Project as an integrated entity and

allocate responsibilities as regards division of work between themselves by organizing the adequate resources for successful completion of the Project. However all parties shall remain jointly and severally responsible for the satisfactory execution of the Project in accordance with the Contract terms and conditions.

5) JOINT AND SEVERAL LIABILITIES.

All partner of Joint Venture /Consortium shall be liable jointly and severally during the Pre-qualification and Bidding process; and in the event the contract is awarded, during the execution of the Contract, in accordance with Contract terms.

6) WORKING CAPITAL

Each party shall contribute working capital for equipment, labour and material or any expenses incurred for execution of the Project or any other investment required in connection with the execution of the project proportionate to the participation ratio.

7) BID SECURITY:

Bid Security, Performance Security and other securities shall be paid by the Joint Venture /Consortium except as otherwise agreed.

8) PERSONNEL & EQUIPMENT

Team of Managers / Engineers of all the partners of the Joint Venture /Consortium will form part of the core management structure and assist in execution of the project. The list of Personnel and equipment proposed to be engaged for the project by each Party will be decided by the management committee.

9) NON PERFORMANCE OF RESPONSIBILITY BY ANY PARTY OF JOINT VENTURE /CONSORTIUM.

a) As between themselves, each Party shall be fully responsible for the fulfillment of all

obligations arising out of its scope of the work for the Project to be clarified subject to the Agreement between the Parties and shall hold harmless and indemnified against any damage arising from its default or non-fulfillment of such obligations.

b) If any Party fails to perform its obligations described in this Agreement during the execution of the Project and to cure such breach within the period designated by the non-defaulting party, then the other party shall have the right to take up work, the interest and responsibilities of the defaulting party at the cost of the defaulting party.

c) Stepping into the shoes of the existing partner of Joint Venture /Consortium with all the liabilities of the existing partner from the beginning of the contract with the prior approval of company.

d) Notwithstanding demarcation or allotment of work of between/amongst Joint Venture /Consortium partners, Joint Venture /Consortium shall be liable for non-performance of the whole contract irrespective of their demarcation or share of work.

e) In case bid being accepted by Company, the payments under the contract shall only be made to the Joint Venture /Consortium and not to the individual partners.

10) BANK A/C.

Separate Bank A/c. shall be opened in the name of the Joint Venture /Consortium in a scheduled or Nationalized Bank in India as per mutual Agreement and all payments due to the Joint Venture /Consortium shall be received only in that account, which shall be operated jointly by the representative of the Parties hereto. The financial obligations of the Joint Venture /Consortium shall be discharged through the said Joint Venture /Consortium Bank Account only and also all the payments received or paid by company to the Joint Venture /Consortium shall be through that account alone.

11) LIMIT OF JOINT VENTURE /CONSORTIUM ACTIVITIES.

The Joint Venture /Consortium activities are limited to the bidding and in case of award, to the performance of the Contract for the Project according to the conditions of the Contract with the Employer.

12) TAXES.

Each Party shall be responsible for its own taxes, duties and other levies to be imposed on each party in connection with the Project. The taxes, duties and other levies imposed on the Joint Venture /Consortium in connection with the P:roject shall be paid from the account of the Joint Venture/Consortium.

13) EXCLUSIVITY

The Parties hereto agree and undertake that they shall not directly or indirectly either individually or with other party or parties take part in the Bid for the said Project. Each Party further guarantee to the other party hereto that this undertaking shall also apply to its subsidiaries and companies under its direct or indirect control.

14) MISCELLANEOUS:

a. Neither party of the Joint Venture /Consortium shall assign, pledge, sell or otherwise dispose all or part of its respective interests in the Joint Venture /Consortium to a third party without the Agreement of the other parties in writing and also without the permission of the Employer.

b. Subject to the above clause, the terms and conditions of this agreement shall be binding upon the parties, the Directors, Officers, Employees, Successors, Assigns and Representatives.

15) APPLICABLE LAW

This agreement shall be interpreted under laws and regulations of India**.**

IN WITNESS Whereof the Parties hereto have hereunder set their respective hands and seals the day, month, year first above written.

For …… For…… For……..

Signature……. Signature…… Signature……

(Name & Address) (Name & Address) (Name & Address)

…… …….. ……

(Official Seal) (Official Seal) (Official Seal)

Place …… Place …… Place ……

Date …… Date …… Date ……

Witness Witness Witness

Signature ……. Signature …… Signature ……

(Name & Address) (Name & Address) (Name & Address)

…….. ……..

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e-TENDER DOCUMENT FOR DESIGN, SUPPLY, RENOVATION, COMMISSIONING AND TESTING OF EXISTING RAPID LOADING SYSTEM ALONGWITH ASSOCIATED CONVEYOR SYSTEM WITH EXTENDED WARRANTY OF THREE YEARS [comprehensive maintenance with Spare Parts and Consumables shall be delivered periodically and not less than twice annually, throughout the balance period of Thirty Six (36) months of the total guaranteed period of Forty Eight (48) months from the date of the Owner's Acceptance Certificate] **AT CHP/CPP, PIPARWAR.**

CONTENTS OF SECTION

TECHNICAL SPECIFICATION

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PREFACE – INSTRUCTIONS

1. **INTRODUCTION:** These Technical Specifications identify the technical requirements of the Goods and Services which are the subject of this Tender.

The Technical Specifications are presented in following parts:

(A)PREAMBLE:-
1) General Mine Information
2) Geography and Climatic Conditions.

(B) SYSTEM DESCRIPTION AND BASIC DATA.

(C) SCOPE OF SUPPLY & WORKS.

(D) GENERAL REQUIREMENTS:-

1) Goods (Equipment and Machinery).
2) Supervision of Erection and Commissioning.
3) Standards.
4) Bidder's/ Supplier's Responsibility.
5) Spare Parts Provisions.
6) Performance Guarantee.
7) Deemed Breakdown.
8) Composite Warranty / Guarantee.
9) Special Condition.
10)Quality Assurance.

(E) EQUIPMENT SPECIFICATIONS.

2. **CONFORMITY WITH SPECIFICATIONS**: The Equipment to be provided shall conform to the requirements defined in these parts (Part A: Preamble, Part B: System Description and Basic Data, Part C: Scope of Supply & Works, Part D: General Requirement and Part E: Equipment Specification).

3. **SITE VISITS: The bidder at his own responsibility, cost and risk, is advised to visit and examine the site and its surroundings and obtain all information that may be necessary for preparing the bid and entering into a contract for Design, Supply, Renovation/Refurbishment, Commissioning & Testing services with extended warranty.**
   Bidder shall be deemed to have visited and inspected the Site(s), made all enquiries and collected all information documentary or otherwise, including climatic conditions, site conditions and other prevalent conditions and fluctuations thereto irrespective of whether

he actually visits the site/area or not and that the bidder has taken all the factors into account while placing the offer as considered necessary for the proper and accurate preparation of its bid.

4. **TECHNICAL RESPONSE:** Bidders shall provide a Clause-by-Clause conformity demonstrating compliance with the Owner's Technical Specifications together with full supporting technical literature, data sheets, Quality Assurance plan, test certificates, certificates from statutory bodies as applicable. The proposal offered by Bidders will be evaluated technically based on the information presented in the bid without reference to extrinsic evidence.

   Failure to provide any information requested in any part of this specification may deem the bid nonresponsive.

   All offers and supporting documents should be in English only. Transcript certified by competent authority of supporting documents to be uploaded if any.

SECTION-A

PREAMBLE

SECTION –A
PREAMBLE

1.0 GENERAL: In case of any clarification required in respect of the NIT, the owner should be contacted through NIC portal only as per specified method of NIT. All the equipment and facilities are to be supplied by the successful bidder within the stipulated time period. All equipments/shall be designed, fabricated and selected as per relevant Indian standards/international standards and up to date engineering practices and necessary inspections/ test certificates shall be submitted along with equipment. Supplier to certify the quality and genuineness of critical components and capacity and other technical parameters of the equipments system.

2.0 LOCATION : Piparwar CHP/CPP is located in the Piparwar Area of Central Coalfields Ltd. in Chatra district of Jharkhand between latitudes 23.68º and longitudes 85.05º. It is an established project since 1992 and having sufficient infra-structural facilities like Banks, Mobile facility, markets, guest house, Bus services from Ranchi etc

3.0 COMMUNICATION : Piparwar project is connected to Ranchi by a metalled road via Khalari and to Hazaribagh via Barkagaon. The distance of the Piparwar project from Ranchi is about 80 Kms. The project is accessible by a pucca road .The nearest railway station is 'Ray' on Gomoh Dehri-on-sone loop line of East Central Railway and is located about 10 Kms away from the project.

4.0 CLIMATE: The climate is tropical with hot summer. The temperature during summer (March to June) goes as high as 50 ºC. The minimum temperature during summer is around 25 ºC. The summer nights are pleasant. The winter (November to February) is cold and minimum temperature is recorded as 5ºC. The rainy season is generally from June to October. The annual average total rainfall is 1350 mm. The average monthly rainfall during monsoon period is 300 mm.

5.0 ABOUT THIS TENDER: This tender document is being issued in 2 (Two) Parts. The Part-I (Volume- I) shall deal with the commercial part and Part –II (Volume-II) Scope of Equipments Supply with Works and Technical Specifications. The proposal is to renovate/refurbishment of existing Rapid Loading System through belt conveyors and SILO for fast evacuation of coal from Piparwar CHP/CPP. At present washed Coal of size (-) 100 mm is being conveyed by belt conveyors and provision of diverting stack coal through belt conveyor to SILO for onward despatch through railway system. The washed coal can be directly sent to SILO. This tender document (in short) is **FOR DESIGN, SUPPLY, RENOVATION, COMMISSIONING AND TESTING OF EXISTING RAPID LOADING SYSTEM ALONGWITH ASSOCIATED CONVEYOR SYSTEM WITH EXTENDED WARRANTY OF THREE YEARS AT CHP/CPP, PIPARWAR. THE TOTAL GUARANTEED PERIOD OF FORTY**

EIGHT (48) MONTHS FROM THE DATE OF THE OWNER'S ACCEPTANCE CERTIFICATE.

6.0 GENERAL: In case of any contradiction amongst these parts/sections of the Bidding documents, the Owner should be contacted for clarification as per specified method of NIT. Also where there are discrepancies in text and drawings, the data given in the text is to be followed. All the equipment and facilities are to be supplied by the successful bidder within the estimated time period. All equipment/systems shall be designed, fabricated and selected as per relevant Indian standard/International standards and up to date engineering practices and necessary inspections/test certificates shall be submitted along with equipment supply to certify the quality and genuineness of critical components and capacity and other technical parameters of the equipment/systems.

SECTION - B

SYSTEM DESCRIPTION AND BASIC DATA

SECTION - B
SYSTEM DESCRIPTION AND BASIC DATA

1.0 SYSTEM DESCRIPTION: After the coal beneficiation process, the washed coal is being carried out by conveyor no -1026 and stacked into stockpile by a slewing conveyor no-1027 and stacker 1702. The washed coal can directly be fed to RLS by diverting the washed coal from conveyor no.1026 to conveyor no 1019 which feeds to SILO. There are two nos. of stockpiles on either side of slewing stacker provided in the system. At one side, one no portable scraper re-claimer is provided for mechanized reclamation of washed coal. The coal thus reclaimed is conveyed by conveyor 1028 to the transfer tower 1107. From the junction house 1107, coal is further conveyed by conveyor 1019 to the top of SILO for discharging into SILO. There is also a provision in the existing junction house wherein the coal can be directly fed to rapid loading system through conveyor 1018 bypassing the coal washery.

2.0 SYSTEM CAPACITY: Input Capacity of raw coal for the Piparwar washery is 6.5 MTY. The wagon (rake) loading facilities have been designed to achieve a nominal loading rate of 5000 TPH. The wagon loading system consists of a 2700 tonnes Silo which is fed by conveyor-1019 at a rate of 2300 TPH.

3.0 BRIEF DESCRIPTION OF WORKS: The tender is for Renovation /Refurbishment of existing Rapid Loading System with associated conveyors at CHP/CPP Piparwar, Piparwar area. The brief description of works is as under:

I. **TOTAL TURNKEY JOB:** Designing, Engineering, Fabrication, Assembly, Supplying, Installation & Commissioning and Testing of each equipment in all possible mode of operation to Renovate/Refurbish the existing RLS system at Piparwar CHP/CPP along with associated conveyors and other equipments. All Civil, Mechanical, Electrical, Instrumentation and automation works required for smooth and uninterrupted operation of Rapid Loading System with extended warranty of three years after initial Guaranteed/warranty of one year alongwith maintenance provision as defined on the NIT.

II. **SILO WITH RAPID LOADING SYSTEM**: A concrete SILO of 2700 Tonnes with self flowing capacity is already installed. The concrete structure of SILO is in good condition. The liners need to be cleaned with thorough scrapping and cleaning of SILO is also required for giving exterior grade paint coating. The priming coat shall be with distemper primer or cement primer, as required in the description of the item. Distemper Coat : For new work, after the primer coat has dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub out the priming coat. All loose particles shall be dusted off after rubbing. One

coat of distemper properly diluted with thinner (water or other liquid as stipulated by the manufacturer) shall be applied with brushes in horizontal strokes followed immediately by vertical ones which together constitutes one coat. The Rapid Loading silo was provided with four outlets to discharge material into one-weigh bin. Each silo outlet was provided with two nos. hydraulically operated rolling slide gates operating from both side of opening. The loading will be done through rapid loading system .The loading shall be controlled from control room located at first floor of the silo. The rate of loading will be around 5000 TPH matching the creep speed of locomotive. The rakes will be hauled by a creep controlled locomotive at 0.6 to 0.8 km/hr. Ultrasonic or Radar level indicators will be provided in the silo to show the coal level position. Air blasters shall be provided to avoid /break the arch formation inside the silo and to ensure smooth coal flow through the silo. The system shall have the switches for emergency stop of feed conveyors in case of overfilling of silo. There shall be temperature sensors to indicate the abnormal temperature inside the silo and provide caution so that fire fighting measures can be taken up. One no of lift has also been envisaged for different level of existing SILO complex which was not previously there. It shall be erected beside the Silo without giving any Load to the existing Silo structure. However, horizontal linking may be done without giving any structural load on the SILO structure.

III. CONVEYOR 1019: The existing conveyor structure of 1019 conveyor is proposed to be reused from discharging end to drive structure (to a length of about 185.73 meter from SILO). This portion of structure is required to be strengthened. The remaining length of belt conveyor from Drive structure to 1106 transfer station (to a length of about 171 meter) is required to be replaced completely. The total length of the Conveyor will be 356.73 meter. The walkway platform from start to end is also required to be replaced completely. There should be replacement of roof covering at places where it is missing. As per previous design 200 KW x 3 tripple tandem drive conveyor was installed there with 1600 mm steel-cord belting. These details are provided as reference to the bidders for designing their indigenous/imported equipment parameters. It is further advised that the existing Australian design of the Belt Conveyor Systems at different places are running without trouble, since 1992. So, existing design parameter maybe used. Bidders has to make structural modification in the reused/old structure portion for adaptability for supplying installation and commissioning of new complete belt conveyor system including supplying and commissioning of 1600 mm steel-cord belts. The bidders to provide and commission proper illumination system throughout the walkways of 1019 conveyor system for round the clock operation of the system. The standard of equipment and its safety appliances required for operation are given separately.

IV. ADDITIONAL SUPPORT FOR 1019 CONVEYOR FROM 4 POLE TO SILO (TO A LENGTH OF ABOUT 190 MTR): From Sampling station to SILO structure, there are 5 spans between existing supports. It is proposed to provide additional supports in the centre of span in all the five spans. The span through which road is

passing shall have specially designed support/guard against accidental spillage of coal. The brief description of the positional supports are as follows: Additional support material as per specification, Quantity : 7 nos. of additional support made from 508 mm OD seamless pipes, Wall thickness of Pipe should be 9.53 mm and all together 411 meters 508 mm diameters seamless pipe will be required for fabrication of 7 sets of additional support as detailed in section-E

V. CONVEYOR 1028: The existing conveyor structure of 1028 conveyor is proposed to be reused from 1107 transfer point to a length of around 82 meter. This portion of structure is required to be strengthened with through scrapping, painting and welding where ever necessary. The remaining length of belt conveyor i.e. 412 meter is to be supplied new and required to be replaced completely. The walkway platform around 82 meter is also required to be replaced completely. There should be provision of roof covering take-up portion of belt conveyor where it is missing. As per previous design 280 KW single drive conveyor was installed there with 1400 mm PN/EP belting. These details are provided as reference to the bidders for designing their indigenous/imported equipment parameters. Bidders to made structural modification in the reused/old structure portion for adaptability for supplying installation and commissioning of new complete belt conveyor system including supplying and commissioning of 1400 mm PN/EP belts. The bidders to provide and commission proper illumination system throughout the walkways of 1028 conveyor system for round the clock operation of the system. The standard of equipment and its safety appliances required for operation are given separately.

VI. TRANSFER STATIONS: The following jobs are required at 1106 & 1107 transfer point. Through scrapping and painting with primer and antirust painting inside and outside of transfer point of 1028 conveyor system. The roof cover of 1107 transfer is to be provided new along with proper illumination system, dust suppression system fire fighting arrangement and there should be a ten line Tele-communication system for the proposed RLS system. Further the discharge chute towards 1019 conveyor at 1106 transfer station shall be reinforced with thorough scrapping, cleaning , inside and outside painting with proper illumination ,dust suppression etc as mentioned above for 1107 transfer station. One 5 Te EOT crane shall be installed at 1107 transfer station.

VII. DUST SUPPRESSION PUMP INSTALLATION ALONGWITH PIPE LINE LAYING THROUGH-OUT THE CONVEYORS AND SILO: Around 50mts away from the tail end of 1028 conveyor there is a source of clear water where a pump house is already existing for firefighting arrangement of coal stocks. There is space for construction of another pump house for dust suppression system for transfer station 1106 & 1107 and at suitable places of SILO. Construction of Intake Well shall be done in such a way that constant flow of water from the existing water pond shall be received through pipe with suitable strainer arrangement and construction of pump house and intake well, supply and installation of submersible/non priming pump-set complete with electrical with standby arrangement shall be in the scope of bidder.

Power supply shall be taken from existing power system lying installed there and sequential operation of Dust suppression pump from existing control room etc will be within the scope of bidder. Provision of water jets for cleaning of dust at each transfer points shall be provided along with provision of water jets at 50 meter interval of conveyors 1019 and 1028.

VIII. **SUB-STATION 4214**: The existing Sub-station was designed with two nos. of 1.5 MVA, 11 KV/3.3KV power transformer along with one no 0.75 MVA, 11 KV/415V transformer to feed power to conveyors 1016, 1017, 1018, 1019, 1027, 1028 and associated equipments. Presently only one 1.5 MVA transformer is existing and the **2nd transformer will be within the scope of bidder.** Only supplying and commissioning of one 1.5 MVA, 11 KV/3.3 KV power transformer will be within the scope of bidder. All primary & secondary control of the power supply arrangements at sub-station is lying installed (Toshiba make). But three nos. of 3.3 KV, VCB complete new draw-out unit only (Toshiba make) VCB Panel type UV3GAM insulation voltage: 3.6 KV, Operating voltage : 3.3 KV, Current : 200 A, PT Ratio: 3.3 KV / 110 V, Fuse : PFC3., Control Voltage: AC 110 V, costing US $ 7385 per unit as per offer received from TOSHIBA, Japan will be required for repairing of the starting units of proposed Belt Conveyors and other minor repairing is required along with sequential control of conveyor 1019 and 1028. The details of supply & repairing are explained in section E.

IX. **SUB-STATION 4215:** The location of this sub-station is within SILO complex. The source of power to this sub-station will be fed through 11 KV over headline from 4211 substation, which is not within the scope of the bidder. The bidder has to draw 11 KV power from the pole itself with provision of 100 meters, 70 sq. mm, 11kV grade XLP cable (Al) with outdoor and indoor pole mounting kit jointing etc. Presently 4215 substation is vacant. Bidder has to install two no. of outdoor type 750 KVA, 11 KV/415V trans-switch unit with all Primary and secondary control at 4215 substation with secondary NGR protection as per CEAR-2010. The outgoing of trans-switch unit will feed power to Motor Control centre at 4215 substation. The motor control centre will feed power to SILO equipments, Lift at SILO, Sampling Station, Lift at sampling station and 100 KVA 415/240V lighting transformer. The cabling from the outgoing of the TSU/Transformer to all load points will be within the scope of bidder which will include control cable, cable terminal boxes etc.

X. **RENOVATION/REFURBISHMENT OF AUTOMATIC SAMPLING SYSTEM**: There was a provision of Ramsey make automatic sampling system at conveyor 1019. The existing sampling system is required to be replaced with new one. One no goods cum passenger lift is required in the existing structure for comfortable access to different levels of sampling station. The mechanical structure of the sampling station will be reused for the commissioning of automatic sampling station with suitable structural modification for adaptability of the sampling system. Thorough scrapping along with anti-corrosive painting to be done throughout the structure. It is to be noted

that the structural support for the lift shall be constructed separately without giving any extra load to the existing structure.

XI. ILLUMINATION SYSTEM IN SILO COMPLEX & CONVEYOR GALLERIES: The conveyor galleries of 1019 and 1028 and SILO complex are required to be illuminated with energy efficient luminaries as per the standard illumination level.

XII. Dust suppression system at transfer points.

XIII. Ventilation system as required at SILO complex and 4215 substation.

XIV. Plant cleaning & drainage.

XV. Fire fighting system along with **water supply arrangement including receiving, storage and distribution of water for fire fighting**.

XVI. Necessary lifting tools and tackles and spot repair facilities at desired location.

XVII. Any extra equipment in addition to above if required.

4.0 SUPPLEMENTARY ITEMS:-

(I) The Equipment package shall be provided with a comprehensive tool kit, which shall include any special tools required for erection, commissioning and for the maintenance and repair of all the Equipment. The following special tools generally required for repair, maintenance & troubleshooting / testing of major subassemblies shall be provided in addition to any other special tools required for the offered equipment.

(a) Hydraulic pressure checking gauges of suitable range.
(b) Socket set with torque wrench of reputed make covering all sizes of high torque bolts.
(c) Dial Indicator Gauge with Magnetic base.
(d) Cartridge filter opening tool, if required.
(e) Digital multi-meter.

The bidder has to certify that any other tool if required over and above the list of comprehensive tool kit shall be provided by the bidder at no cost to owner/owner during the contract period.

(II) First fill of all Oils, Grease and Lubricants needed for test and commissioning of each equipment.

(III)(a) All Filters & O-rings, Seal Kits pertaining to all systems of equipment (as deliberated at **Section-B (3)(II) to (XVI)** is required for first 6000 working hours.

(b) All filter elements along with O-rings/Gaskets/Seal Kits and fast moving spare pertaining to all the systems of equipment are as follows there should be extended warranty of three years of the following equipment after initial Guaranteed/warranty of one year :

(i) Rapid Loading System with one Loading System and PLC.
(ii) Conveyor System with accessories 1019.
(iii) Conveyor system with accessories 1028.

(iv) Newly incorporated Dust Suppression System with Pumps etc.
(v) Automatic Sampling System.
(vi) 2 nos. of Lift with accessories (one 408 kg and one 1500 kg).

The comprehensive maintenance alongwith with Spare Parts and Consumables shall be delivered periodically and not less than twice annually, throughout the balance period of Thirty Six (36) months of the total guaranteed period of Forty Eight (48) months from the date of the Owner's Acceptance Certificate.

5.0 SAMPLE DATA:-

Sl. No.	**No. of SILO**	**One (01)**
(i)	SILO Capacity	2700 Tonnes
(ii)	Material to be handled	Washed Coal
(iii)	No of Loading Point	One
(iv)	Moisture Content	Inherent moisture 7 to 10 % Surface moisture up to 20%
(v)	Bulk Density	0.8 t/m^3 for volume calculation & 1.15 t/m^3 for load calculation
(vi)	Loading capacity	5000 T/H
(vii)	Conveyor Capacity (Rated)	2300 TPH
(viii)	Rake Movement Speed	0.6 to 0.8 Km/h
(ix)	Type of Wagon	Box 'N' type 58.8T,Box'C'56.28T, Bottom discharge type 60 T
(x)	Rake Size	58-60 boxes
(xi)	Loading Schedule	3 shifts 7 days/week
(xii)	Maximum Temperature	48^0C (50^0C for equipment design)
(xiii)	Minimum Temperature	4^0C
(xiv)	Power Supply	415 ±10 % V AC, 3ø,50 Hz
(xv)	Mode of Loading	Pre Weigh Batch

SECTION-C

SCOPE OF WORKS & SUPPLY

(MECHANICAL, ELECTRICAL, ELECTRONICS AND CIVIL)

SECTION-C
SCOPE OF SUPPLY & WORKS
(MECHANICAL, ELECTRICAL, ELECTRONICS AND CIVIL)

1.0 GENERAL:-

1.1 The tender document is for Renovation/Refurbishment of SILO and RLS of Piparwar CHP/CPP including planning, design, engineering, manufacture, fabrication, assembly, testing, packing, transportation to site, insurance, spares for warranty period ,Tools and Instrument Kit, delivery to site, installation ,erection, commissioning and testing including associated civil, electrical, mechanical, electronics ,instrumentation and control works and other allied auxiliary facilities such as ventilation(at desired place) , dust suppression, fire fighting etc required for smooth operation of system. All the components of the RLS shall be designed for operation round the clock, at rated capacity & other duty parameters specified in NIT.

1.2 The Scope of Work also includes Renovation/Refurbishment, Design, Engineering, Fabrication, Supply of Mechanical & Electrical equipment, Tools and Instrument Kit, spares for warranty period and extended warranty period, Civil & Structural work, Erection, Testing & Commissioning of Belt Conveyor 1019 and 1028 for transport of (-) 100 mm coal. The Conveyor shall be so designed to achieve required lift within specified motor capacity, considering all the physical parameters required to design the conveyor and safety factors. The conveyor should be suitable to operate in a humid, dusty and wet environmental condition at the ambient temperature may vary upto 50°C and Relative Humidity is about 98%. All the components of the conveyor shall be designed for operation round the clock, at rated capacity & other duty parameters specified in NIT.

1.3 The contract for the work will be split into three parts **(01) One covering the Supply part, (02) The other covering the Works and Services part, (03) Spares & Consumables for extended warranty period.** All the parts will contain a cross fall breach clause specifying that any breach of any one part will also constitute breach of the other contract and the whole contract combined.

1.4 The equipments and works mentioned hereinafter are to be read in conjunction with preamble (Part-A), System Description and Basic Data (Part-B), the Technical Specification (Section E) are indicative and not limited to the description and/or list given.

1.5 All Mechanical, Electrical & Electronic equipments and Systems and Civil works required for renovation/refurbishment of RLS system and associated conveyors are within the scope of supply and works of contractor.

1.6 All mechanical, electrical & electronic equipments and systems and civil works required for supply, installation, testing & commissioning of sampler and two no. of passenger cum goods lift at silo and automatic sampling station.

2.0 SCOPE OF SUPPLY:-

2.1 The Supplier is required to provide all necessary components to renovate/refurbish the existing rapid loading system Accessories, Spare Parts, at Piparwar CHP/CPP. The owner will make available to the Supplier necessary area /areas within the site(s) boundaries as may reasonably be required by the Supplier for the purposes of erecting the equipment and for storage of Goods and tools etc. Security, protection, lighting and any other facilities required by the supplier in such areas shall be the responsibilities of the Supplier. The detailed list of spares is provided in technical specification Section E.

2.2 The supplier is required to provide all the electrical equipments like drive units, control panels, switchgears, cables etc, mechanical items like, pulleys, idlers, rollers, chutes, belts, gear boxes etc and electronic items with all safety installation along with audio visual alarms required for revival of associated conveyors 1019 & 1028. As explained earlier the bidder shall not to provide 3.3 KV starters for the Belt Conveyors 1019 & 1028 which is available at 4214 Sub-station and needs some repairing as explained earlier, instead they have to provide LCS (Local Control Switch) beside the motor of Belt Conveyor, the LCS unit should have 200 Amps forward reverse Isolator with provision of centre off, as per prevailing system of other units. The detailed list is provided in technical specification Section E.

2.3 The suppliers is required all the electrical, mechanical and electronics equipments with all safety installation along with alarms for commissioning of and two no. of passenger cum goods lift at Silo and automatic sampling station.

2.4 The suppliers is required all the electrical, mechanical and electronics equipments with all safety installation along with alarms for commissioning of automatic sampler.

2.5 However, any other item(s) which are not specified herein but may be required for completing of the renovation of RLS and associated conveyors and its safe & efficient operation is/are also included in the Scope of Supply. In case any of the parts specified above is (are) redundant /not applicable for the system offered due to variation in design, the same shall be indicated by you which will be acceptable only if the absence of the part(s) do not adversely affect the functioning, performance and safety of the system.

2.6 SUPPLEMENTARY ITEMS:-

(i) The Equipment shall be provided with one set of comprehensive tool kit, which shall include any special tools required for erection, commissioning and for the maintenance and repair of all the Equipment. The special tools provided in Annexure-A generally required for repair, maintenance & troubleshooting / testing of major subassemblies shall be provided in addition to any other special tools required for the offered equipment. The bidder has to certify that any other tool if required the list of comprehensive tool kit shall be provided by the bidder at no cost to owner during the contract period.

(ii) First fill of all Oils, Grease and Lubricants needed for test and commissioning of each equipment.

(iii) All Filters & O-rings pertaining to all systems of equipment is required for first 6000 working hours.

ANNEXURE: "A"

Sl. No.	SPECIAL TOOLS
1	Hydraulic pressure checking gauges of suitable range.
2	Socket set with torque wrench of reputed make covering all sizes of high torque bolts.
3	Dial Indicator Gauge with Magnetic base.
4	Cartridge filter opening tool, if required.
5	Digital multi-meter.
6	Dial Indicator Gauge with Magnetic base.
7	Clamp type tong tester.
8	Electrical kits for opening and maintenance of electrical equipments.
9	Ball type hammer two (02) nos.
10	Hydraulic jack – 100 Te
11	Drill Electric (1-1/2")
12	Hydraulic cable jointing kit suitable up to 240 sq. mm cable size.
13	Feeler gauges
14	Dial gauges (alignment)
15	Vernier caliper (Internal and External)
16	Hack saw frame with blade
17	Tri square
18	Plumb bobs
19	Bucket volume grease gun
20	Files 10", flat rounded half rounded bastered fine files etc.
21	Torque wrenches (2", 4", 8") of suitable torque capacity
22	Standard ring spanners (up to 30 mm)
23	Standard DE spanners (up to 30 mm)
24	Tubular box spanners
25	Socket box spanners
26	Belt puller (Motorized winch type with 200 mm rope capacity 1.5 Te)
27	Circlip extractors, bearing extractors and oil seal extractors
28	Four inch diameter wheel, AC motor driven portable grinding machine and flexible grinder.

29	Engineers level gauge
30	Cabinet 2’ x 4’ with 2 Nos. carrying trays
31	Bearing puller for up to 250 mm diameter bearing
32	Sound level meter
33	Vibration meter
34	Adjustable wrench 10” & 12’
35	Slip joint pliers 6” & 8”
36	Rib glove pliers 10”
37	Diagonal pliers 6”
38	Long nose pliers 6”
39	Chain nose pliers 8”
40	Side cutting pliers 8”
41	Speeder handle
42	Ratchet spanner
43	Universal joint
44	5 pcs screw drive set (-)
45	5 pcs screw drive set (+)
46	Wire tripper 4”
47	Pass meter
48	Sledge hammers
49	Pneumatic wrench
50	Deep socket

2.7 INFORMATION AND DRAWINGS: At least two (02) month before scheduled installation date, the Supplier shall provide following for each equipment.

2.7.1 Suitably illustrated Printed/Legible Xerox copies of

(i) Service/Shop Manual (ii) Parts Book and (iii) Operation & Maintenance Manuals for each type / model of equipment covering all Assemblies & Accessories, written in English language bound in book form. One set of Manuals & Part Books to be submitted to GM (E&M)/HOD office CCL Ranchi should be **Printed only.**

(ii) One Printed set to project.

(iii) One soft copy of above preferably in CD / Pen drive, to GM (E&M)/HOD office CCL, Darbhanga House, Ranchi.

2.7.2 PERT chart for erection & commissioning indicating erection site requirements and

the capacity of Cranes or any other handling equipment(s) during the course of erection, commissioning & final testing. The Supplier shall also submit the data identified in the specifications for major assemblies/items of Equipment proposed. The Supplier shall supply detailed Equipment's drawings illustrating major assemblies locations, foundation and placement for items such as RLS, Conveyors, Lift, Fire fighting system, Safety Devices etc. as per the details required in Part IV. In addition, the Hydraulic, Electrical & Pneumatic circuit drawings (not the block diagram) as applicable should be given after becoming the successful bidder. All the installation & circuit drawings should be legible preferably printed on adequate size drawing sheet for easy reference, interpretation & evaluation. The successful bidder has to submit at least six(6) sets of the drawings is to be provided/ All drawings should be prepared in AutoCAD in standard format and CD/Pendrive containing such drawings shall also be supplied along with hard prints. The successful bidder shall have to submit monthly progress report of the various works being carried out.

3.0 SCOPE OF WORKS & SERVICES:-

3.1 The scope of work covers all the related civil and structural works, transportation, insurance, storage at site, erection and commissioning, performance tests, detailed engineering, PAT & FAT, trial run and handing over of plant including but not limited to the following:

(i) Design & engineering of all mechanical, electrical, civil and structural works Required for renovation of rapid loading system & SILO.

(ii) Erection, testing and commissioning of all the equipments required for renovation of rapid loading system.

(iii) The civil works required for strengthening of existing structures and for new structures/foundation required for completeness of system is within the scope.

(iv) Performance guarantee test.

(v) Design & engineering of all mechanical, electrical, civil and structural works required for renovation of conveyor 1019 &1028.

(vi) Erection, testing and commissioning of all the equipments required for renovation of conveyor 1019 &1028.

(vii) Erection, testing & commissioning of all electrical, civil and structural works required for renovation of SILO substation 4215.

(viii) Installation /Refurbishment of electrical control of two conveyors in the existing substation 4214.

(ix) Erection, testing and commissioning of all the equipments required for new installation of automatic sampler in existing place.

(x) Design & engineering of all mechanical, electrical, civil and structural works required for incorporation of two no. of passenger cum goods lift at Silo and automatic sampling station.

(xi) Erection, testing and commissioning of all the equipments required for incorporation of two no. of passenger cum goods lift at Silo and automatic sampling station.

(xii) Any other works/services not mentioned but required for the completeness and commissioning of the Rapid system

(xiii) In addition the mentioned system of equipments as per clause of Section B- (4.0) (III)(b), will be covered by an extended warranty of three years having total warranty period of four years, for which CCL is ready to purchase consumables and spares for the extended period and total bid value will be decided on 4 years basis along with provision of maintenance personnel and inspection as defined on the NIT.

3.2 All the items and works specified in this document and any other equipment and work found necessary but omitted is deemed to have been covered in the scope of supply and works in the tender without any increase in the contract price.

3.3 The bidder is responsible for obtaining approvals from Weights and Measure Department.

3.4 Air, water and noise levels shall be within the permissive limits as specified in the bid document. Additional requirement and stipulation by State/ Central Pollution Control Board, if any, on the subject shall also be applicable.

3.5 ADHERENCE TO INDIAN STANDARDS: All the works including designs, drawings, construction, fabrication, testing, erection etc. shall be done strictly as per Indian standards. In absence of Indian standards, International standards like British, American, German or Russian may be used. A copy of the standard used shall be furnished along with the concerned drawing/document during approval.

3.6 The equipment list indicates only broad parameters and the accessories required for successful commissioning/operation of RLS shall be considered to be part of the total works. The other terms and conditions of the works including technical, commercial etc. shall be governed by the clauses of the bid and contract.

3.7 The technical parameters to be furnished are subject to scrutiny/approval at the detailed design stage which may undergo minor changes keeping in view the system requirement and various codes of practices/regulation by the statutory bodies. The parameters not specifically mentioned in the bid document shall be decided at the time of detailed engineering subject to owner's approval.

4.0 DETAILS OF WORKS & SERVICES:-

4.1 DESIGN ENGINEERING:-

(i) Elaboration and furnishing of system design/drawing, based on actual parameters of equipment to be supplied. The system design as proposed in the system description shall form the basis of this elaboration.

(ii) Preparation and furnishing of all relevant detailed engineering drawings based on elaborated system design drawing duly approved by owner (CCL) in writing. This includes fabrication, assembly, installation and erection drawings.

(iii) Furnishing of detail design calculations in support of different design and equipment parameters.

(iv) Furnishing of equipment specification supported by manufacturer's illustrative pamphlets and literature.

(v) We have considered design engineering cost @5% of corresponding equipment value of the following equipments and devices:

a. Belt conveyor system
b. Rapid loading system

c. Additional support for conveyor 1019
d. Dust suppression system.
e. Fire fighting system
f. Illumination system
g. PLC system
h. Automatic sampler
i. Lifts
j. Motor control system
k. Communication from RLS to different key locations.
l. Welding system, cable laying, control transformer
m. Lightning protection system of SILO
n. EOT crane at 1107 transfer station.
o. CIM rail Scale
p. Belt weigher
q. Civil Design

Any item not considered on the above list but required for design purpose shall be deemed to be included in the above list

(vi) All drawings and documents to be submitted for Approval shall be supplied in six copies along with one soft copy of Auto-CAD drawing /Excel worksheet on CD/Pendrive. All approved drawings and documents shall be supplied in six copies in addition to one copy in ink on polyester tracing paper of approved quality and one copy on CD/Pendrive. Final drawing/literature shall be presented in the form of document.

(vii) All drawings shall comply with current Indian Standard specifications and shall be sufficiently detailed with dimensions and shall be clear and legible.

(viii) The bidder shall submit detailed time schedule in the form of PERT NETWORK for complete Job and subsequently for each major activity for monitoring purpose. The same should be updated from time to time. This is essential in view of maintaining time schedule. The successful bidder shall have to submit monthly/quarterly progress report of the various works being carried out.

4.2 ERECTION AND COMMISSIONING:-

4.2.1 Erection & commissioning of tail end frame with drum, external cleaner, skirt board, intermediate structures, take-up, drive head including motor, gear box & couplings discharge drum, conveyor rollers, single / two way discharge chute for conveyors, safety switches and laying of belting as specified further in NIT and vulcanizing of conveyors 1019 and 1028 including components detailed in technical specifications.

4.2.2 The renovation of transfer points of conveyor 1019 and 1028 is in contractors' scope.

4.2.3 Erection and commissioning of All new receiving chutes with liners to conveyors at material receiving points and all new discharge chutes with liners from conveyors to material discharge points.

4.2.4 Civil and structural works as required for renovation of system. Renovation of existing foundation/structure and new foundation/structure as required for the completeness of the system. Further the erection and commissioning of additional supports will require

grouting, concreting the base of additional supports as per specific design suggested on the NIT including supplying and fitting of holding-down bolts base plate of thickness 30 mm as detailed separately.

4.2.5 Installation and commissioning of load cell based weighing system.

4.2.6 The erection, commissioning and testing of all equipments required for renovation of SILO substation (4215) is to be done by contractor. The erection, commissioning & testing of required equipments related to conveyors 1019 & 1028 at substation 4214 are to be done by contractor. The renovation of 4214 is partial with provision of spares as required as detailed separately.

4.3 SAMPLING SYSTEM: For determining the quality of coal dispatched by each rake there shall be provision of automatic sampling of coal from the feed conveyor to the silo. The sampling system shall conform to BIS /ISO/ASTM specifications and shall consist of a primary sampler fitted to feed conveyor i.e. 1019 and to convey the primary sampled coal to the sample preparation system.

4.4 SAFETY DEVICES: All the equipment and conveyors in the circuit shall be provided with necessary safety devices such as emergency stop switches, overload protection, wire-netting, railing type or guards, pull chords switches, belt sway switches, zero speed switches, brakes, holdback devices, etc wherever applicable. All equipment will be started and stopped from the central control room in a pre-determined sequence consecutively i.e. one by one with a definite time lag. The sequence of starting of drive will be in the reverse direction of coal flow, while stopping of the drives will be in the direction of coal flow. In case of stop of any equipment in the circuit for any reason, all the preceding equipment/conveyors shall be stopped automatically. Pre-start hooters shall be blown to alarm the operating and maintenance personnel. All the floors and distant transfer houses shall be provided with audio-visual signals to alarm the working personnel locally. Necessary walkways and crossovers shall be provided along the conveyors (Detailed separately). Under-netting shall be provided wherever conveyors cross any roads or working areas as elaborated elsewhere. Interlocking of CHP/CPP main control room and SILO control room is also required for proper sequential control of the plant and SILO.

4.5 DUST SUPPRESSION: Proper water supply arrangement for dust suppression will be made at dust generating points so that all working space remains free of dust. For dust suppression water jets will have to be provided in silo loading point & transfer houses. All civil works pertaining to dust suppression shall be as per system requirement. Dust suppression system should be suitable for water which is available at Project. The pumping sets for the dust suppression/ control should have 100% stand-by at separate location near tail-end of conveyor no.1028. The dust-suppression system is applicable for all the transfer points of conveyors 1019 and1028 and discharge point at SILO top. Necessary measures shall also be taken for noise and vibration control.

4.6 REPAIR FACILITIES: Provision for site storage of spares and tools shall also be made at SILO. All lubrication charging points shall be dust free. There shall be provision for

welding-outlets connected to welding circuits for connecting welding leads for welding works at all transfer points of conveyors 1019 and 1028 and along conveyors at 50 meter interval and SILO top. The welding outlets shall be provided with enclosed type industrial sockets of suitable rating.

4.7 PLANT CLEANING AND DRAINAGE: Suitable arrangements shall be made for cleaning of plant especially at the spillage point with the help of water jets by providing valve points at 50 meter interval at all along the Conveyor 1028 & 1019, Transfer Station 1106 and at SILO complex. Water pipe line network along with connection/tapping points with control valves at suitable intervals shall be provided in the transfer and drive houses, conveyor galleries for pressure cleaning of floor chutes, walkways etc. Proper drainage arrangement will have to be made all along conveyors 1019 and 1028 with transfer points and SILO as explained separately. At every probable spillage point suitable arrangement will have to be made for mechanized or manual cleaning.

4.8 FIRE FIGHTING: Fire fighting system shall comprise of

(i) Hydrant system.
(ii) Mobile fire extinguishers.
(iii)Fire detection : Substation and control room

Fire fighting system shall be designed to meet the various requirements laid down in the fire protection manual by the Tariff Advisory Committee (TAC), India and National Fire Alarm Code by NFPA (USA).

- **Hydrant system**: The fire hydrant system shall be designed for the SILO complex generally as ordinary hazard as per TAC manual and shall consists of a network of over ground piping feeding pressurized water to a number of double headed hydrant valves located at key points. Water tank and pump house for fire fighting at SILO complex will be within the scope of work.

- **Portable & Mobile Extinguishers**: Portable extinguishers of carbon dioxide type, dry powder type & soda acid/ DCP type shall be installed at suitable locations of SILO as per TAC manual. Mobile extinguishers of required number shall be provided. Different types, as described above, shall conform to the latest BIS standards.
- **Fire Detection and Alarm Annunciation System**
  The Fire detection system shall be "Conventional wired type". A microprocessor based addressable automatic fire alarm control panel (Loop Controller) with necessary controls and signal indications has been envisaged to annunciate a fire alarm. This panel shall receive the electric signal from the fire / heat / smoke detectors, Manual Call Points (MCP), hooters, Response indicators (group flashers), isolator and control modules etc. and convert it into visual and audible alarm and also incorporate a facility to provide an alarm at a remote location. Area under protection shall be divided into loops depending upon the number of detectors, Manual Call Points, different type of interfacing modules etc. and each detector shall be addressable type having unique address to pinpoint the exact location of fire. The

detectors for each loop shall be connected to the control panel by a separate pair of 2-core cable, thus separating the visual indication for each loop.
The fire alarm panel / loop controller shall be located at a place where attendant shall be available round the clock.

VENTILATION: Proper exhaust arrangement at operator's cabin of SILO shall be provided.

4.9 ILLUMINATION SYSTEM: The design of illumination system including fittings and installation will be aimed at providing proper level of illumination in both inside and outside of RLS Complex and conveyor galleries with safety and decorative features. LED Lamps shall be used for outdoor lighting & indoor lighting according to the nature and requirement of the place. The light fittings should be as per standard practice applicable for CHP/Mines etc. The illumination shall be carried out with help of 4 Sqmm 3 core armoured Copper Cable with proper fixing.

The required lux level shall be as per **DGMS (Tech.) (S&T) Circular No. 0*6* of** 2016 **Dhanbad, dated** 08.04.2016.

Two Nos. 100 kVA 415V / 230 V (L-L) lighting transformers shall be installed at 4215 sub-station for the purpose of illumination . The distribution of power for illumination system shall be made through Lighting Distribution Boards located at strategic places as required . The two transformers shall remain so connected as to ensure reliability of lighting system and uninterrupted power supply to lighting load during outage of one transformer.

4.10 EARTHING SYSTEM: The earthing system shall strictly conform to the CEAR (Measures relating to safety and electric supply) regulation, 2010 as amended up-to-date and IS-3043 current. Main earthing grid shall be provided around the periphery of Substations and Silo Loading system and along the conveyors for interconnection of grids of the buildings as well as to earth the electrical equipment on the conveyors like pull cord switches, belt sway switch, receptacles etc.

Each motor, transformer, 3.3 kV switchboard panel, 415 V MCC, control and relay panels, lighting panels, receptacles, push button stations, junction boxes and other electrical equipment should be earthed by two separate earthing strips. In addition all the motors will be earthed through the armoring of the connecting cable. Size of earthing strip and electrodes shall be as per requirement of relevant IS.

However, the size of main earth bus strip shall not be less than 65 mm x 5 mm whereas that of the connecting earthing strip shall not be less than 25 mm x 5 mm.

Conveyor structure, cable tray supports, cable trays etc. shall not be considered as earthing conductors. Metallic sheath, screens/shields and armour of all cables shall be earthed at both the ends at the equipment where the cables are terminated. Suitable earthing clips shall be provided as required.

Cable trays shall be earthed at every 10 meter intervals. Adequate care shall be taken towards earthing of light-fittings, welding sockets etc.

Separate earth pits for earthing of neutral of transformers and lightning arrestors shall be provided. All joints and connections of earth lead shall be welded/bolted securely.

The resistance to earth as measured shall not exceed 1 ohm. Test pits shall be provided at all interconnecting grid connections. Interconnection with employer's earth grid if any shall be made at least at two points.

4.11 LIGHTNING PROTECTION: Lightning protection against direct stroke shall be provided for SILO buildings, conveyor gantries of 1019, having a height of 10 m or more. The lighting protection shall conform to IS 2309. Earthing system for lightning protection shall be independent of the earthing system for electrical equipment.

4.12 PLANT MONITORING AND CONTROL SYSTEM: The existing PLC plant monitoring system is having latest technology and sufficient spare modules are available for interfacing. The new incorporation of two nos. belt conveyor, auto sampler and RLS etc are to be interfaced with the existing PLC system.

4.13 COMMUNICATION SYSTEM: Suitable communication system to be provided in RLS operator's cabin to communicate with different key locations as explained separately.

5.0 AIR CONDITIONING: Panel room of substations shall be provided with conditioning of inlet air and control of humidity for proper operation of equipment and comfortable working of personnel inside the room. Split type air conditioners of 1.5/2 Te capacity as per requirement should be provided at Control rooms. The design and modification of all rooms shall be such that it shall be possible to prevent entry of dust and at the same time maintaining the proper temperature inside for proper working of the equipment and the personnel. Control Rooms shall be provided with double doors. Sufficient numbers of ceiling fan and exhaust fan shall be provided wherever required. This is applicable for SILO control room and 4215 sub-stations.

SECTION-D

GENERAL REQUIREMENTS

SECTION-D
GENERAL REQUIREMENTS

1.0 GOODS (EQUIPMENT AND MACHINERY): Detailed specifications of the Equipment to be supplied are given in Section-E. In general, all items shall be: New, unused and of the current design (incorporating latest proven features) and not likely to be discontinued or become obsolete in near future. Designed and constructed to handle without overload and for the transportation capacity stated, Designed to facilitate ready access, cleaning, inspection, maintenance and repair of component parts, designed to facilitate rapid changeover of consumable items. The component parts of all items shall, wherever possible, be selected from the standard ranges of reputed manufacturers. The Equipment and accessories shall be robust and where necessary capable of dismantling for transportation and ready re-assembly using simple tools. All Equipment items provided shall be designed to be compatible within the proposed overall Scope of Supply & Works. Electrical Equipment shall provide all protection devices, controls and interfaces for the Equipment to operate safely and efficiently. All workmanship and materials shall be of first class quality in every respect. All parts and surfaces, which are exposed to corrosive environments, shall be suitably protected to prevent any effects of corrosion or erosion.

1.2 SUPERVISION OF ERECTION AND COMMISSIONING: The supplier shall be responsible for the erection and commissioning of the equipment at site. All civil work will be performed in accordance with scope of Works. The supplier shall depute qualified and competent Engineer(s) to supervise the entire assembly, erection and commissioning of equipment free of cost for suitable man days including Sundays & Holidays if worked for erection, commissioning and test running, as well as training in operation and maintenance of the equipment at site. Commissioning shall include testing of the equipment at maximum rating undermine operating conditions as specified to the satisfaction of the user. The general tools & tackles as well as special tools supplied with the equipment for commissioning, maintenance & repair of machine shall also be available to the supplier. The technicians/ expert shall remain at site following commissioning until all necessary personnel of owner are fully conversant with the maintenance and operation of the equipment.

1.3 STANDARDS: The design, supply, erection, commissioning and testing of all equipment shall in all respects comply with the requirements of this specification and with appropriate current International & Indian standards indicated in Equipment Specification or as

applicable. The system of units for all measurements shall be the Système International d'Unités (S.I.).

1.4 BIDDER/SUPPLIERS RESPONSIBILITY: The Owner requires that the Supplier shall accept responsibility for the provision of complete operable and compatible Equipment and systems within the Scope of Supply & Works. This document identifies only the major items required for the installation and the Supplier shall ensure that the total supply includes all necessary Equipment for it to function effectively, safely and efficiently. Any additional items the Supplier considers necessary to ensure compliance with such a requirement shall be identified and included. If the Bidder observes that this Specification document contains any anomalies, ambiguities, flaws, errors or omissions, the Bidder shall immediately bring these to the attention of the Owner. The Supplier shall be responsible for the testing and commissioning of the Equipment and ensure that it meets the requirements as specified. The commissioning and setting to work of the whole Equipment Supply package shall be carried out under the supervision of the Supplier in conjunction with the Owner's nominated personnel. In addition of above the supplier shall be responsible for following:

2.0 SPARE PARTS PROVISIONS:-

2.1.1 AVAILABILITY OF SPARE PARTS: All items and Equipment proposed shall be of current design and manufacture. The Supplier shall warrant that sufficient spares and servicing facilities will be available to maintain the Equipment in use throughout its life. The Bidder shall stock sufficient fast moving & maintenance spares as well as critical assemblies and their repair parts in their Local Depots to ensure maximum availability of their equipment during its life time. The bidders are required to give details of their existing local depots. Such bidders having no local depots presently shall furnish an undertaking that they shall immediately open a Local depot and shall stock aforesaid essential items for their offered equipment model in event of placement of order on them. In case of noncompliance, CCL shall be at liberty to de-bar them from any future tenders.

2.1.2 BOUGHT OUT ASSEMBLIES AND SUB-ASSEMBLIES : The supplier is required to furnish details such as make, model code and vital technical parameters of all major bought out assemblies/items as indicated in the technical specification against "Information to be provided by the bidder." The bidder has to furnish a certificate indicating therein that "All other components not identified/ mentioned herein are manufactured by the bidder at their works exclusively i.e. the components are proprietary of the bidder's firm.

2.2 PROVISION OF SPARE PARTS: Within the Contract Price, the Owner shall agree to purchase all operational, maintenance and standby/contingency spare parts, consumable items, wear materials (hereinafter collectively referred to as "Spare Parts and Consumables" unless the context requires otherwise) and maintenance tools & special tools, in accordance with the Supplier's recommendations for Forty Eight (48) months from the date of issue of the Acceptance Certificate. Consumables shall not include oils & lubricants for the purpose of the guarantee but the supplier shall provide all necessary oils & lubricant for the purpose of

commissioning the equipment and undertaking tests on completion of commissioning in accordance with the contract. The bidders have to upload the list of (i) Spare parts & Consumables for warrantee period per equipment wise and (ii) Spare Parts and Consumables for balance 3 years beyond the warranty period of the equipment per year per equipment wise (i.e. extended warranty) for full tendered quantity with techno-commercial bid.

2.2.1 In the event that the Spare Parts and Consumables, as recommended by the Supplier, in any way fall short of actual requirements during the period for which they are said to be adequate, the supplier shall provide such additional Spare Parts and Consumables as are necessary at the final destination. Such additional Spare Parts and Consumables shall be provided by the Supplier to the Owner free of all cost and shall be transported to Site by air freight internationally and by air, rail or fast road transport within India.
2.2.2 In the event that the operation of the plant is inhibited or frustrated as a direct result of lack of Spare parts and Consumables pursuant to clause 2.2.1 hereof, then the period referred to in clause 2.2 hereof shall be extended by a period of not less than the period during which operation as aforesaid was inhibited or frustrated.

2.2.3 The supplier shall not be liable for the supply of additional Spare parts and Consumable, if these are required by reasons of unforeseen accidents, negligence or misuse on the part of the owner.

2.2.4 The assessment of the bidder of the Spare parts & Consumable requirements shall be based upon the expected working hours 6000 (Six thousand) per year as defined in the Performance Guarantee Clause of Section-D(2.6), included as the attachment to the technical specification. However, Any shortfall in quantity of these spares and any other spares over and above the list submitted with offer during the period of 48 months or up to 24000 working hrs, shall have to be supplied by the supplier at free of cost. **Any shortfall in quantity of above items, if required beyond 24000 working hrs,** shall have to be supplied by the supplier at extra cost.

2.2.5 In the event that the spare parts and consumables, as recommended by the supplier are in excess of the actual requirements. The owner at its option:

(i) Retain such excess spares and consumables as, in discretion, it may elect to do so.
(ii) Require the supplier to reprocess or repatriate or otherwise dispose-off such excess spare parts in exchange for payment to the owner of the contract Price of the spare parts and consumables concerned.

The owner shall notify the supplier, in writing of its requirement under the clause within thirty (30) day after completion of the contact period of 48 months.

2.3 EMERGENCY SPARE PARTS:-

2.3.1 Emergency spare parts required by the owner to repair breakdowns shall be dispatched to the site by the supplier by the fastest, practicable means as directed from time to time by the owner.

2.3.2 FOR THE PURPOSE OF THE CLAUSE-2.3.1: Emergency spare parts" shall mean those spare parts or components required by the owner to repair any item of plant supplied pursuant to the contract in the event of a breakdown not attributable to a failure covered by the guarantee or a failure of the supplier to provide adequate warranty "spare parts or consumables".

2.3.3 LIFETIME SPARES: The supplier has to undertake and guarantee to produce and maintain stocks to be available for purchase by the owner under separate agreement of all spare parts and consumables as may be required for maintenance and repair of the plant throughout its working life. In the event that the supplier wishes to terminate production of such spare parts the supplier shall:

2.4.1 Give not less than 6 months notice in writing of its intention to terminate production in order to permit the owner reasonable time in which to procure needed requirements; and

2.4.2 Immediately following termination, provide to the owner at no cost manufacturing drawings, material specification and necessary permission to manufacture of the spare parts elsewhere.

2.4.3 Any change in part number or supersede part number should be informed to the CCL headquarter – E&M Department and the Incharge at project/site wherever the equipment is operating. In any event the supplier shall not seek to terminate manufacturer of spare parts for a period of not less than 10 years from taking over.

2.5 OILS, LUBRICANTS AND FLUIDS: Not less than one month before the scheduled date for acceptance, the supplier shall provide to the owner a detail schedule of all necessary oils, lubricants, fluids for the operation and maintenance of the equipment. The schedule shall indicate estimated annual consumption and specify the appropriate international standard number or the name and reference number of an equivalent available in India considered being acceptable by the supplier. As far as possible lubricants marketed by the Indian Oil Corporation shall be used. The variety of lubricants shall be kept to a minimum possible. Detailed specifications for the lubricating oil, grease, gases, servo fluids, control fluids, chemicals etc. required for the complete plant covered herein shall be furnished. On completion of erection, a complete list of bearings/ equipment giving their location and identification marks shall be furnished to the Employer along with lubrication requirements. Equipment shall be lubricated by systems designed for continuous operation. Lubricant level indicators shall be furnished and marked to indicate proper levels under both stand still and operating conditions.

Consumption of all these consumables during the initial operation and final filling after the initial operation shall also be included in the scope of the Vendor. Vendor shall also supply a quantity not less than 10% of the full charge of each variety of lubricants, servo fluids, gases, chemicals etc. used which is expected to be utilized during the first year of operation. This additional quantity shall be supplied in separate Containers.

2.6 PERFORMANCE GUARANTEE:-

2.6.1 The Supplier shall guarantee that the Equipment supplied pursuant to the Contract shall be available to the Owner at the level hereinafter defined to perform to criteria of not less than that defined in the Technical Specifications incorporated in the Contract.

2.6.2 The Supplier shall guarantee that the Equipment shall be available to perform its duty to minimum criteria and to the minimum availability percentage level. The method of assessment applied shall be as follows:

Method of Assessment: The following calculation shall determine the availability of the Equipment:

The RLS shall have guaranteed availability of 85% availability will be calculated over 365 days of operation and following formula shall apply. The Supplier shall guarantee that the availability of the equipment shall not be less than **85% (Eighty five percent) for a period of 48 months from the accepted date of commissioning measured over each twelve (12) month period**.

$$\% \text{ Availability} = \frac{\text{Production shift Hrs - Down time Hrs.}}{\text{Production shift Hrs - Maintenance hours.}} \times 100$$

WHERE
Production shift Hours = 24 Hours per day
Maintenance Hours = 4 Hours per day
Breakdown Hours = Actual number of hours and will include time spend on waiting for spares, service experts etc.
Down time = Maintenance Hours + Breakdown Hours

Down time shall not include:

(I) Damage due to abusive use or incorrect operation methods by the Owner,
(II) Accidents,
(III) Strikes or stoppage of work by the Owner’s personnel,
(IV) Natural disaster,
(V) Lack of Spare Parts not attributable to a failure of the Supplier, it's Agents or Representatives. Downtime shall also specifically include all hours lost due to failures determined to be guarantee failures. The supplier shall upload a schedule of maintenance required to carry out preventive maintenance and shall state the number of manpower and hours per day required to carry out each maintenance task. The time stated shall, with the agreement of the Owner, form the basis of the assessment of the availability. The average

maintenance hours shall not be more than 4 hours per day. In case the site personnel of CCL are unable to carry out the daily maintenance in four hours, the supplier will train the project personnel to enable them carry out the normal routine maintenance within four hours every day.

The Owner will assist the Supplier, without relieving the Supplier of any other obligations under the Contract, to achieve the guaranteed availability by:-

(1) Providing normal and proper maintenance, including preventive maintenance in accordance with the Supplier's furnished standard/published recommendations, and making all necessary repairs using only genuine manufacturer's spares.
(2) Providing co-operation to all Supplier's authorized representatives.
(3) Where appropriate, providing and maintaining such conditions as:

- Proper electrical Supply.
- Consistent supply of sized Coal.

(4) Providing all Supplier's authorized representatives access at all reasonable times to the machine service and repair facilities. Maintaining a logbook for each shift wherein the working hours, breakdown times, maintenance hours, idle time, etc. shall be recorded. This record will be available for examination and signature by the Supplier's representative.

2.7 EFFECT AND DURATION OF PERFORMANCE GUARANTEE:-

2.7.1 This Performance Guarantee shall become effective on the day on which the Equipment is commissioned at the Site. Commissioning shall be evidenced by the issue of the Owner's Acceptance Certificate.

2.7.2 This Performance Guarantee shall remain effective for Forty eight (48) months from the date of commissioning, irrespective of the hours operated by the Equipment during the period of the guarantee.

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2.7.3 COMPENSATION FOR NOT ACHIEVING GUARANTEED AVAILABILITY: In the event that the Equipment fails to achieve the Guaranteed Availability herein provided during this Forty eight (48) months period, the Supplier shall be liable to pay to the Owner, as Penalty, a sum equal to, as indicated hereunder for each equipment :

(i) 1% of the delivered price of the equipment for every percentage reduction and part thereof from the Guaranteed Availability for the first 5%.

(ii) 10% of the delivered price of the equipment for reduction beyond 5% from the Guaranteed Availability. If the availability of the Equipment falls by more than 10% of the guaranteed availability during the Warranty period, the owner will have the option to reject the equipment after levying 10% penalty and the manufacturer will have to replace the complete/part of equipment as applicable at their cost to meet the guaranteed %age availability".

If the availability of the Equipment falls by more than 10% of the guaranteed availability during the Warranty period, the owner will have the option to reject the equipment after levying 10% penalty and the manufacturer will have to replace the complete/part of equipment as applicable at their cost to meet the guaranteed %age availability".

2.8 DEEMED BREAKDOWN: When the supplier is unable to supply the replacement of a failed part under warranty within 21 days of giving intimation by the consignee and if the machine is commissioned by using the spare from the stock of the project the period (after 21 days) till the supplier replaces the part under warranty shall be treated as **"Deemed Breakdown"** (the credit for keeping machine available shall not be given to the supplier).

2.9 COMPOSITE WARRANTY / GUARANTEE : The Supplier shall warrant that the equipment supplied under this contract is :

(i) In accordance with the contract specifications.

(ii) The equipment shall have no defects arising out of design, material or workmanship & the complete equipment shall be warranted for 12 months from the accepted date of commissioning. Any defect arising observed on this account will have to be attended immediately. Any failed assembly/ sub assembly/ parts due to design, manufacturing or workmanship defect during this warranty period of 12 months shall be supplied by the supplier free of cost.

After completion of 12 months initial guarantee period there will be 36 months extended guarantee period for which CCL will purchase spares parts and consumable as explained at Section : B (4.0)(III)(a) & (b) within the contract price and the bid will be decided on the cost of 48 months basis inclusive of spares cost and consumables.

(iii) The supplier must ensure that there is no major breakdown due to manufacturing / design defects during the warranty period. In case such breakdown occurs the owner reserves the right to extend the warranty period suitably. The warranty shall cover for total equipment so that ultimate/ comprehensive responsibility lies only with the Equipment Supplier although components may be supplied by different suppliers to the Bidder.

2.10 INITIAL OPERATION:-

2.10.1 On completion of all pre-commissioning activities / tests and as a part of commissioning the complete facilities shall be put on 'Initial Operation' during which period all necessary adjustments shall be made while operating over the full load range enabling the facilities to be made ready for the hand over.

2.10.2 The duration of 'Initial Operation" of the complete equipment shall be fourteen(14) days out of which at least seventy two (72) hours shall be continuous operation on full load

or any other duration as may be agreed to between the Engineer and the Vendor. This clause is also subject to availability of Railway Rakes.

2.10.3 The 'Initial Operation" shall be considered successful provided that each item of the equipment can operate continuously at the specified operating characteristics, for the period of 'Initial Operation". For the period of 'Initial Operation", the time of operation with any load shall be counted. Minor interruptions not exceeding four (4) hours at a time caused during the continuous operation shall not affect the total duration of trial Operation. However if in the opinion of the Engineer the interruption is long, the initial operation shall be prolonged for the period of interruption.

2.10.4 A 'Initial Operation" report comprising observations and recordings of various parameters to be measured in respect of the above initial operation shall be prepared by the Vendor. This report, besides recording the details of the various observations during initial run shall also include the dates of start and finish of the 'Initial Operation" and shall be signed by the representatives of both the parties. The report shall have sheets, recording all the details of interruptions occurred, adjustments made and any minor repair done during the 'Initial Operation". Based on the observations, necessary modifications/ repair to the plant shall be carried out by the Vendor to the full satisfaction of the Engineer to enable to the latter to accord permission to carry out Performance and Guarantee Tests on the Plant.

However, minor defects, which do not endanger the safe operation of the equipment, shall not be considered as reasons for withholding the aforesaid permission.

2.11 EQUIPMENT ACCEPTANCE: The equipment ordered will be finally accepted subject to the supplier demonstrating to the owner or its authorized representative (may be third party) that the equipment when tested as indicated below meets the performance data provided by the supplier. A detrimental deviation of up to 2.5% will be accepted.

(i) **HOURLY RATED OUTPUT OF SPECIFIED CAPACITY:** To be tested at site on 30 (thirty) operating days average immediately after commissioning under operating conditions as stated in the ITB (Information to be provided by the Bidder). The equipment may be operated at the supplier's discretion either by the supplier's personnel or by the Owner's personnel who are to be authorized by the supplier.

SECTION-E

EQUIPMENT SPECIFICATIONS

SECTION-E
EQUIPMENT SPECIFICATIONS

1.0 SCOPE OF SPECIFICATION: This specification is intended to cover the technical requirements for the Design, Engineering, Manufacturing, Fabrication, Supply of Mechanical & Electrical equipment, Tools and Instrument Kit, spares for warranty period, Civil & Structural work, Erection & Commissioning of one Rapid loading system and associated conveyors in CHP/CPP of Piparwar, CCL.

2.0 REFERENCES: All equipment and spares of equipment / plant / system, all equipment parts, systems and works covered under this specification shall comply with all currently applicable statutory regulations and safety codes of the Republic of India as well as of the locality where they will be installed, including the following:

2.1 ELECTRICAL: Indian Standards / Central Electricity Authority Regulations, 2010 for Measures Relating to Safety and Electric Supply.

2.2 MECHANICAL: Indian Standards/ Bureau of Indian Standards (BIS) / Indian Factories Act and State Factories Act

Regulations of the Central Pollution Control Board, India
Pollution Control Regulations of Department of Environment, Government of India State Pollution Control Board.

Rules for Electrical installation by Tariff Advisory Committee (TAC).
Standards currently in force in the country of manufacturer of the equipment and spares shall be applied, provided that they are similar or superior to the standards mentioned above.
All measurements, dimensions, weights, etc. of equipment and spares shall be indicated in SI units.
In case of non-availability of relevant IS, then equivalent International Standard will be applicable.

2.3 CIVIL: All workmanship, material and work items shall confirm to relevant IS/BIS/MORTH/IRC/NBC standards. In case of items not adequately covered by above mentioned standards, the CPWD/NBO practices shall be followed.

2.4 The codes, and/or standards referred to in these specifications shall govern, in all the cases wherever such references are made for design of various equipments/system etc. Latest edition shall be followed by the Vendor for all the codes and /or Standards. In case of a conflict between such codes and/or standards and the specifications, the latter shall govern such codes and/or standard referred to shall mean the latest revision, amendments/changes adopted and published by the relevant agencies. In case of any further conflict in this matter the same shall be referred to the Employer whose decision shall be final and binding.

2.5 Other internationally acceptable standards which ensure equal or higher performance than those specified shall also be accepted subject to the Owner's approval, for which the Vendor shall furnish, adequate information to justify that these standards are equivalent or superior to the standards referred. In all such cases the Vendor shall furnish specifically the variations and deviations from the standards mentioned elsewhere in the specification together with the complete word to word translation of the standard that is normally not published in English.

2.6 In case of any change in codes, standards & regulations between the date of bid opening and the date when vendors proceed with fabrication, the Owner's shall have the option to incorporate the changed requirements or to retain the original standard. It shall be the responsibility of the Vendor to bring to the notice of the Owner such changes and advise owner of the resulting effect.

3.0 RAPID LOADING SYSTEM:-

Sl. No.	**No. of SILO**	**One (01)**
(i)	SILO Capacity	2700 Tonne
(ii)	Material to be handled	Washed Coal
(iii)	No of Loading Point	One
(iv)	Moisture Content	Inherent moisture 7 to 10 % Surface moisture up to 20%
(v)	Bulk Density	0.8 t/m^3 for volume calculation & 1.15 t/m^3 for load calculation
(vi)	Loading capacity	5000 T/H
(vii)	Conveyor Capacity (Rated)	2300 TPH, Designed-2500 TPH
(viii)	Rake Movement Speed	0.6 to 0.8 Km/h
(ix)	Type of Wagon	Box 'N' type 58.8T,Box'C'56.28T, Bottom discharge type 60T
(x)	Rake Size	58-60 boxes
(xi)	Loading Schedule	3 shifts 7 days/week
(xii)	Maximum Temperature	48^0C (50^0C for equipment design)
(xiii)	Minimum Temperature	4^0C
(xiv)	Power Supply	415 ±10 % V AC,3ø,50 Hz

(xv)	Mode of Loading	Pre Weigh Batch

3.1 DESIGN CRETERIA: The Rake Load out System is a computer controlled, operator attended, automatic, semi-automatic weighing and loading system capable of static weighing accuracies of plus or minus 0.05%. The system should be capable of loading a minimum of 98 percent of the wagons of each rake to plus or minus 250 KGs of the desired weight of each wagon, at loading rates up to 5000 TPH load out rate (assuming a consistent delivery rate of material to the weigh bins). The loading station shall be located over rail track for loading of coal in rakes. The train/ rake consists of 58 wagons (maximum) of 70 t capacity each and will be loaded at the rate of approximately 5000 TPH. The train will be hauled by diesel locomotive/ electric locomotive and will run under the loading point at a creep speed. Each wagon will take one minute to pass under the loading point. The system envisages loading of 70 t capacity wagon in about one minute. System consists of a 2700 ton capacity silo having four openings for loading. The openings are provided with four gates below the silo over one weigh bin. Hydraulic system is envisaged for the operation of loading and discharge gates and telescopic chutes. The entire telescopic chute arrangement shall be made compatible for the handling of rake by electric engine, if required in future. The telescopic chute will be capable of handling semi solid / slurry material in rainy season. The equipment will be required to operate 18 hours a day and 330 days a year, but the design will be such that it can be operated 24 hours a day and 365 days a year. The surrounding may be quite dusty and surface temperature may vary from 40^{o}C to 50^{0}C and relative humidity up to 98%. The rapid load out system as envisaged in this proposal shall have arrangement such that pre-weighed quantity of coal is discharged into each wagon and the individual weighment is recorded automatically when the weigh system is put in auto mode. Air vents shall be provided between the pre-weigh hopper and 2700 T silo to allow displaced air from the weigh bin to be captured and prevent dust escaping from the system. Adequate no. of heat sensors shall be provided.

3.2 The system should meet following standard as applicable:

(i) National Conference of Weights & Measures in the U.S.

(ii) Pattern Approval from Australia's National Measurement Institute (NMI).

(iii) China's National Measurement Institute.

(iv) Indian Weights and Measures Department.

Serial no. (i) to (iii) is applicable for global bidders with a condition that necessary permission from the metrological department is the responsibility of the bidder and Sl.no.4 is for Indian bidder the same clause is applicable here also.

The system should provide a complete record (which can be viewed, stored and/or printed) of the following data:

(i) Rake origination.

(ii) Rake destination.

(iii) Rake identification code.

(iv) Wagon position number.

(v) Individual wagon identification numbers.
(vi) Individual wagon tare weight
(vii) Individual wagon gross weight.
(viii) Individual wagon target weight.
(ix) Percentage (%) of deviation from desired target weight (measure of repeatability about individual wagon target loads).
(x) Loading completion time and date of each wagon batch.
(xi) Gross, tare and net weight of each batch.
(xii) Total gross weight of Rake in kg and tonne.

To facilitate calibration and testing, certified test weights are located symmetrically on a spreader bar on either side of each weigh bin. The calibration verification or certification tests can be manually performed from the control room. The test weights are attached to each weigh bin by means of hydraulic cylinders. In the normal run mode, the test weights are disengaged from the weigh bin. When calibration tests are performed, the certified test weights are raised and lowered remotely from the control room. This feature allows testing the static weighing accuracy of the weigh bin from the control room from zero to full capacity in 30 – 45 minutes time. This expedites the time required for certification and provides the ability to quickly perform weigh bin accuracy checks.

The rapid loading system should have capability to interface to a coupled-in-motion (CIM) rail scale, which can be utilized to record the tare weights of the wagons coming into the load out area. With the CIM input, the load out system will automatically adjust the desired target weight of the wagon to be filled to compensate for any "wag on carry back" material left in the rail wagon from its previous unloading cycle. The design work includes air transfer duct ports. These ports shall be fabricated and painted on the outside only. One no. CIM Rail scale have to be provided to measure Tare weight of wagon.

3.3 OPERATION: When the presence of rake is detected near silo, the mode selector is in automatic position, gate to be used for loading is selected, the telescopic chute is in position from parking position and permissive signal is given to the system for loading, the corresponding silo outlet gate shall open and then weigh bin will start filling. As the weight in the pre weigh hopper shall reach in the neighborhood of designated load, the gate blades sequentially closed to obtain the desired target wagon weight. When set point is reached the partially opened silo out let gates shall close and weigh hopper ready light will come on. As soon as the first wagon comes under weigh bin discharge gate, the telescopic chute shall be lowered automatically and the flood loading gate shall open. The material is loaded into the wagon. When the weigh-bin is empty the weigh bin discharge gate will automatically closed. Now the silo outlet gates will open suitably for filling the weigh hopper for the next wagon. In this manner the weigh cycle continues automatically until the full train is loaded.

After the loading operation is completed the operator will raise and traverse telescopic chute to the parked position. The weighing system shall also incorporate digital display system with suitable printer for printing of date, time weight of each weighment and net weight of coal

weighment per operation of rake loading.

The existing pre-weigh hopper is of capacity 71 Te which is filled through guillotine gates provided above the hopper and below the silo discharge pockets. The weigh bin are provided with load cells to weigh the material loaded in the hopper while gate is opened and the guillotine gates are closed immediately after filling of desired quantity in the weigh-bin. This is done automatically.

3.4 OPERATION OF TRAVERSING/TELESCOPIC CHUTE: Weigh bin along with telescopic chute is provided with high speed load out to load wagons. The chute shall be traversing/telescoping load out chute. The traversing capability of the entire load out chute shall allow the chute to be positioned out of the railroad envelope and then traversed to a position over the centre line of the railroad tracks once the train engine has passed the discharge area of the loadout. The facility has following functions:

(i) The traversing / telescoping loadout chute traverses from the parking position to the loading position under the weigh bin discharge gate.
(ii) The chute shall move up or down to the proper position in order to profile the loading of coal into wagon.
(iii) The vertical position of the telescopic chute shall be controlled by the operator based on the wagon height that is being loaded.
(iv) There shall be a discharge gate. The material is loaded into the wagon and the discharge closes automatically as soon as weigh bin is empty.

3.5 TECHNICAL REQUIREMENTS: The operator control room shall be refurbished & equipped with control panel, computers, PLC etc

3.6 WEIGHING SYSTEM:-

3.6.1 LOAD CELLS: One (1) set of four dual ended shear beam load cells and load cell mounting assemblies shall be supplied for mounting of the weigh bin in a compression mode (total of four assemblies). Each assembly includes hermetically sealed super precision dual ended shear beam load cell and mounting assembly, which provides self-checking hardware, eliminating external check rods which tend to induce weighing inaccuracies into the system. Each load cell is to be rated at one hundred fifty percent (150%) safe overload, with an ultimate overload rating of three hundred Percent (300%) of rated capacity. In addition, the load cells are temperature compensated to enable stable scale performance over a broad temperature range (0-150°F / - 18 °C to 65°C).

3.6.2 DIGITAL WEIGHT INDICATORS: The digital weight indicator should be designed to display weight measurements with accuracy, speed and resolution. This instrument shall be able to:

(i) Automatic zero maintenance.

(ii) Motion detection.
(iii) Centre of zero indication.
(iv) Approval as per Indian legal Metrological Act/Standard

3.6.2.1 LOAD OUT OPERATOR'S COMMAND CHAIR: The operator's command chair shall be configured with the necessary controls required for loading wagons which will provide the operator the ability to load wagons while providing maximum operator ergonomics and visual contact with the loading operation. Some of the features for the load out operator's command chair are:

(i) Joystick for the vertical control for the loadout chute.
(ii) Manual controls for the charging gates (jog control).
(iii) Low weight override/manual print.
(iv) Emergency stop.
(v) Control for raising and lowering test weight.
(vi) Panel View colour touch type HMI monitor for status of charging gates, discharge gate, traversing/ telescoping discharge chute, test weights, hydraulic power unit, etc.
(vii) Manual dump control for weigh bin discharge.

3.6.2.2 MAIN LOAD OUT PLC CONTROL CABINET: The PLC with Ethernet/IP communication capability for communications to remote PLC and associated I/O modules shall be provided to operate all loadout I/O, including loadout gates, hydraulic power unit, and loadout chute and others. The PLC will be mounted on a floor standing enclosure with door window. All field Inputs/Outputs are rated at 110 V, AC.

3.6.2.3 COMPUTER SYSTEM:-

(i) **Computer:** (1) 2.6 GHz processor, mini-tower computer systems with 4 GB RAM and dual 320 GB hard drives for data recovery, keyboard and mouse for each loadout point.
(ii) **Laser Printers:** One (1) laser printers (one for each loading point) to print the train manifest upon completion of loading. A telephone line or network connection in the control room is required for remote support access. It also included with each Loadout System PC: Windows 7/8 Professional operating system Data recovery services Team Viewer remote connection software

3.6.2.4 SEQUENCE OF OPERATION: The load out control system should have the following Operator Attended Operation Modes (Automatic, semi-automatic, and manual):

(i) **OPERATOR ATTENDED AUTOMATIC (COMPUTER CONTROLLED BATCHING):-**

(a) The operator powers the system up, automatically loading the program.
(b) The mode select switch is placed in the automatic mode.
(c) Train ID's and target weights are then entered by the operator or via In-motion rail scale for the entire train on the system keyboard.

(d) Operator should verify that surge bin is full and reclaim system is operating properly before commencing loading of train.
(e) Operator signals the train to enter the loadout by switching the entrance traffic light signal to green, and then positions the first wagon under the loadout chute.
(f) Operator then moves the discharge chute into the loading position over the first wagon and adjusts the telescoping chute to the proper position for loading.
(g) When the start button is depressed, all weigh-bin charging gates open fully and the weigh bin begins to fill.
(h) The set points established by the computer for that particular batch then sequentially shut the gates.

(ii) **ATTENDED SEMI-AUTOMATIC**: The semi-automatic mode is identical in operation to the fully automatic mode, with the following exceptions.

(a) The computer, along with its related interlocks, is isolated from the system.

(b) No report generation. The purpose of the semi-automatic mode is to allow semi-automatic batching and loading in the event of computer failure.

(iii) **Attended Manual:** This mode of operation is used for testing and calibration, but also allows manual loading in the event of catastrophic damage to the system. Semi-automatic modes, the operator must manually record all in the manual an weights wagon ID numbers. The only exception to this is in the testing and corresponding wagon mode, the printer will automatically records the results of the calibration test.

3.7 SILO OUTLET GATES (4 Nos.): The gates should be heavy duty coal design, double-blade, bi-parting, hydraulically operated, horizontal slide gates, with a required nominal opening. Each gate shall be operated with two (2) heavy-duty hydraulic cylinders, one for each gate blade. Each cylinder shall have cushioning sections on each end to avoid shock loads. Each cylinder shall be Class III, JIC type. These cylinders shall have oversized ports to maintain fluid velocities that are consistent good hydraulic design practice of 4.5 meters per second. Four (4) non-contacting proximity switches are provided for each gate to indicate blade positions and provide interlocking. These sensors will provide full open and full close indication. Typical gate opening time (fully closed to fully open) is 1.5 – 2.0 seconds and closing time (fully open to fully closed) is 1.5 – 2.0 seconds. Sufficient hydraulic accumulation is provided to automatically close each gate should an electrical interruption occur:

(i) These gates will control the flow of coal to pre weigh bin. . Actuation would be by heavy-duty hydraulic cylinder, cushioned at both ends and suitable mounted on the frame of the gate. Four limit switches will provide position indication.

(ii) The slide gate framework will be manufactured from structural channel of suitable design/size.

(iii) The slide gates will be made from minimum 32 mm thick mild steel plates with throat liner of 8 mm abrasion resistance steel liner (minimum 360 BHN) plug welded and will be flat.

(iv) The leading edges of the slide gate will be chamfered.

(v) The gate operation shall be by a hydraulic system.

(vi) The gate blade will be mounted on antifriction rollers for easy movement.

(vii) The painting/finish will be in accordance with IS:1477 (Current). Three coats of approved paint would be applied.

3.8 WEIGH BIN or PRE-WEIGH HOPPER: The nominal capacity of weigh bin is 71 tonnes, based on 800 kg/m³ material (1150 kg/m³ for strength).This is located below the silo and shall be supported on high quality strain gauge dual bridge load cell assemblies. Controlled filling of the weigh bin will be by means of four hydraulically operated horizontal slide gates positioned immediately above. The emptying shall be by means of a gate at the bottom of the weigh bin. Flexible seals are to be' provided between the silo discharge gates and top of the weigh bin to prevent any interference with the weighing. **The weigh bin is**

existing and need proper cleaning and painting with exterior grade paint.

3.9 DISCHARGE GATE: The gates should be heavy-duty, double bladed, bi-parting, hydraulically operated, horizontal slide gate, with suitable opening. The gate shall be operated with two (2) heavy duty hydraulic cylinders, one for each gate blade. Each cylinder shall have cushioning sections on each end to avoid shock loads. Each cylinder shall be Class III, JIC type. These cylinders shall have oversized ports to maintain fluid velocities that are consistent with good hydraulic design practices of 5 meters per second. Four (4) non-contacting proximity switches are provided for the gate to indicate blade positions and provide interlocking. These sensors will provide full open and full close indication. Enough hydraulic accumulation to automatically close the gate should an electrical interruption occur will be provided:

(i) The slide gates will be made from minimum 32 mm thick mild steel plates with throat liner of 8 mm abrasion resistance steel liner (minimum 360 BHN) plug welded and will be flat.

(ii) Each gate shall be operated by two heavy duty hydraulic cylinders.

3.10 TELESCOPIC CHUTE: One standard traversing and telescoping load out chute. The chute shall be designed for heavy-duty coal applications. The inner liner of the load out chute shall be 10 mm thick Chromium Carbide abrasion resistant wear liner plate. A high wagon/collision sensor should also be attached to the load out chute. The bottom of the load out chute shall consist of a breakaway section that will separate from the main chute in the event of a wagon/chute collision, protecting the upper portion of the load out chute, cylinders, and supporting structural members. This breakaway portion shall be connected to the bottom of the discharge chute via small bolts. The chute shall be fabricated from a 10 mm steel plate and appropriate stiffeners. The exterior of the chute finish should be epoxy painted. The chute shall be supported from a steel trolley frame attached to the bottom floor steel of the load out structure. Upon completion of loading, the load out chute would be raised and traversed out of the rail envelope for storage by load out operator. Traversing and telescopic functions of the chute would be accomplished utilizing heavy duty hydraulic cylinders.

In the event of power loss, a failsafe hydraulic valve shall raise the chute to the fully raised position, but will not traverse chute to the parked position.

The telescopic chute with gate would have suitable nominal opening and have the following specific features:

(i) Chutes wall shall be of 10 mm mild steel plate with abrasion resistant liner plates plug welded.

(ii) Shuts and discharge gates shall be electrically or hydraulically interlocked.

(iii) Necessary arrangement shall be provided to give automatic retraction of chute if contact with forward moving wagon or locomotive is made.

(iv) The chute will have shear section such that in the event of a roll back by the locomotive or a wagon and the chute not retracting in time, the shear bolts would be

cut and the lower gate section will merely drop into the wagon safely without any damage to other parts of the chute gate system.

(v) A crushable section will be provided at the lower most section of the chute so that any wagon hitting this section will crush it without causing any other damage to the chute. This crushable section shall be replaceable.

(vi) The chute shall be actuated by heavy-duty hydraulic cylinder cushioned at both ends.

3.11 CALIBRATION SYSTEM: Testing/calibration of the weighing system should be accomplished by doing a substitution or strain test. The test weight desired should as per the relevant Indian standard /international standard. The weigh bins are designed to accommodate the certified calibration weights suspended by hydraulic cylinders. The weights provided shall be symmetrically located on either side of the weigh bin and permanently attached by means of hydraulic cylinders and shackle assemblies. The design is such that with the weights in the lowered position the shackles disengage the weights so as not to interfere with the normal weighing operation. Raising and lowering of the test weights is done at the control console so that calibration can be performed from the control room. In addition, status lights should be provided on the HMI panel to indicate the position of the weights. Limit switches should be provided at each cluster of test weights to give the position indication signal (up/down) to the control system. Weight calibration is to be carried out on a regular weekly basis immediately before train loading. The frequency of calibration may require to be varied by circumstances and by experience build up, once system is in operation.

3.12 AIR CANNON SYSTEM/ARCH BREAKER: To ensure trouble free material flow, air canons have been provided in the system. The present air canons need to be replaced with new ones. The Air Cannon would be complete with air vessel, dryer, mountings, accessory package and inter connecting piping etc. The Air Cannons would be of tried and proven design and would have discharge valve assembly suitably mounted to the Vessel with metallic piston and high temperature resistant soft seat. The entire Air Cannon would be suitable for sustained temperature of minimum 150 degree C that may be encountered if hot coal is contained in the silo, which may raise the temperature in areas adjacent to the Air Cannon. Air Cannons are to be provided as follows:

(i) Location will be as per original design and firing sequence, however, is to be decided during detail design stage.

Each Air Cannon would consist of a reservoir tank to store air under pressure with suitable discharge valve assembly. On command through a programmable electronic controller energizing solenoid valve, a given quantity of air would suddenly be injected into the stuck up material, to help flow of material. The air Canon Vessel should be fabricated from boiler quality plates to IS:2002 and will be designed as per IS:2825 code for unfired pressure vessels. The vessel shall be painted with corrosion resistant, epoxy paint on inside surfaces over one coat of epoxy primer and one coat of red oxide primer followed by two coats of synthetic enamel over external surfaces. The discharge valve Assembly shall be of carbon steel with chrome plating on inner surface and must be mounted suitably to the Air Cannon

Vessel for ease of maintenance and cleaning of piston without dismantling the Air Cannon. Size of Air Cannon discharge should be minimum 100 mm NB with free flow area at all points corresponding to 100 mm diameter. Each Air Cannon should be provided with safety valve, drain plugs, quick exhaust valve. The quick exhaust valve would be connected to the Air Cannon by means of suitable flexible hose with stainless steel wire braiding. The Accessory Package for each Air Cannon shall consist of 3-way solenoid valve. Ball Valve, Check Valve, Air Filter, Air lubricator and connecting Hose. Each Air Cannon would have a suitable designed mounting package for mounting on the silo with minimum 100 mm FB pipe complete with mounting plant, a pair of forged flanges, nuts, bolts and gaskets. Operation of the Air Cannon system will be automatic by means of a programmable electronic controller with an adjustable firing time of 0-99 seconds, between firings, and 0 to 24 hours adjustable cycle time. The timer would be fitted with manual bypass arrangement for individual circuits. The controller would have LED display to indicate individual circuit fired condition. Compressed air will be supplied at pressure of approximate 7 kg/sq.cm. However, air cannons would be desired for maximum working pressure of 9 kg/sq.cm and hydraulically tested at 13.25 kg/sq.cm.

3.13 AIR COMPRESSOR: Two (2) nos. 100% capacity (one working & one standby) screw compressor having capacity of 100 cum per hour at a discharge pressure of 8.5 kg / cubic meter. The compressor shall be complete with 5 cubic meter minimum capacity of air receiver, inter cooler, after cooler and all inter connecting pipe work. The compressor shall be driven by suitable totally enclosed fan cooled squirrel cage induction motor to suit 3- phase 50-cycle 415 V supply. All necessary air filters, pressure gauges, safety valves, non-return valve, low oil and water pressure switches, pressure reducing valve, etc. shall be provided. The compressor shall be capable for working at an altitude of 100 meter and above sea level at maximum ambient temperature of 50 degree and 100% humidity. Air supply is not required to be oil free as some lubrication is desirable for operation of the air blaster.

3.14 HIGH TEMPERATURE DETECTION: For heat detection, minimum (30) thirty temperature sensors are to be embedded in the silo inside walls at three levels to detect any local heating and to give a warning in the loading control room and at the main control room. In the event of overheating being detected, the system will provide audible and visual warning to enable the loading supervisor to take preventive action before a major fire occurs. The system must have battery back up to operate even in the event of power shut down or failure and be of proven type for similar duty application. The complete system shall be provided with cables from sensors to control room, required conduit and indication unit in control room.

3.15 HYDRAULIC SYSTEM:-

3.15.1 HYDRAULIC POWER PACK: Two hydraulic systems shall be supplied for operation of each of the silo outlet gates, the flood loading gates and the telescopic chute system. The system shall be identical to maximize reliability and inter-changeability. The rating of all hydraulic equipment /component shall be well above the duty for which it is

required and shall be suitable for operation in tropical climate and dusty atmosphere. Each of the hydraulic system shall have its own power pack and each power pack shall incorporate dual hydraulic pump (which will provide immediate back up in the event of pump failure) with electric motor, fluid supply tank fitted with necessary pressure and control equipment, filters, gauges, pipe/ high pressure hose work etc. Each of the fluid supply tank shall have ample capacity appropriate to its duty. It shall be fabricated in mild steel and provided with flanged connections for the supply and return pipes. Provision for complete drainage shall be made and flanged apertures for sludge removal shall be incorporated. All pipes returning fluid to the tank shall terminate at a level sufficiently below the fluid surface to prevent aeration. Each suction pipe shall be fitted with a high efficiency filter positioned well below the fluid surface to prevent vortex formation. Preferably the pump may be provided with positive suction head by elevating the tanks above the pumps. The tank shall be equipped with the following gauges etc:-

a. Sight glass giving clear visual indication of fluid level.
b. Low fluid level device with visual and audible alarms.
c. Temperature sensing device with visual and audible alarms.
d. Pressure gauges.

All hydraulic pipe/hose work shall follow the shortest practicable route in neat, straight runs, readily accessible for maintenance yet sited in a position which presents least risk of mechanical damage. Pipe work in unavoidable exposed position shall be effectively protected and all pipe work shall be adequately supported. Electric motor shall be squirrel cage induction motor suitable for 415UU±UU 10%.

3.15.2 HYDRAULIC ACCUMULATOR: Each of the hydraulic system shall also incorporate back up protection in the form of hydraulic accumulator, so that in the event of power failure or pressure failure closing of the gates can be achieved. The accumulator shall have sufficient capacity for a normal open /close of silo outlet emergency or flood loading gate. The accumulator system shall also include necessary hydraulic/ electric control with audio visual alarms. Hydraulic accumulator control should have pressure release valve to be controlled from console.

3.15.3 HYDRAULIC CYLINDER: These shall be of suitable bore and stroke double acting cylinders with cushioned ends. Hydraulic seals shall be suitably selected to prevent ingress of dust and moisture and to provide for longer life.

3.16 LEVEL INDICATION INSIDE SILO: The level indicators provided shall monitor the following:

(i) Continuous level of coal in the silo.
(ii) Pre-determined high coal level in the silo, which will automatically stop the silo feed conveyor. This will also ensure that coal in the highest position will not touch structures on top of the silo.
(iii) Pre determined intermediate level. Pre determined low level in the silo, which will

automatically close the silo outlet gates. It may be just above the RCC cross mounts inside the silo. This is to prevent damage to any RCC work and the silo outlet gates. The gates will remain closed and inoperative until pre determined intermediate level of coal is reached. The equipment will be ultra sonic type or radar type complete with sensors, transmitter and limit controllers together with audio-visual signalling system for different levels. In addition to the direct reading device, comparator shall also be incorporated to detect excessive differential levels across the silo which may occur in the event of certain adverse flow conditions. This will initiate an audio-visual signal to alarm the supervisor and enable him to initiate necessary measures. Continuous silo level/high/low level indication and alarm/annunciation shall be available both in the silo control room. All required cables from sensors/transmitters to control room indicators & conduits as required shall be provided. Silo control room shall be provided for fast loading silo. The silo control room shall be located to give the operator full view of the loading operation. The silo operation shall be controlled through control desk provided in the silo control room. The silo control room shall be air-conditioned. Vendor to indicate size and control room. Facility for printout of silo pre-weigh system as well as in motion weigh bridges shall be available in the silo control room. This data shall also be available in the main CHP control room.

3.17 CONTROL DESK: Mosaic based control desk type for mounting push buttons/meters etc. with doors at the rear. The mosaic grid tiles shall be of 24 mm x 48 mm (or 25 mm x 50 mm) size, made of heat and flame retardant, self-extinguishing and non-hygroscopic material with flat-matt finish without glare and non-reflecting type. PC based OWS (Operator Work Station) of PLC shall be mounted on control desk to house PC/ keyboards/ mouse etc. The profile and dimension shall be decided during detailed engineering and shall be subject to Employer's approval. Necessary controls, indications and annunciations for all the above equipment shall also be provided in main control desk as described elsewhere.

3.18 TRAIN TRAFFIC LIGHT SIGNAL: One (1) train traffic light signal load out system shall be provided, each consisting of one red and one green light with sun visors. The train traffic light signals would be mounted prior to the entrance of each load out facility. This light provides a signal between loadout operator and train engineer. Upon approach of a train, this signal will be set to red, signaling the train to stop prior to the load out station. When the system is ready to load, the control room operator will notify the train engineer by switching the entrance traffic signal to green, which signals the train engineer to spot the first wagon into loading position. Radio communication device shall also be provided.

4.0 DRIVE EQUIPMENT:-

4.1 GENERAL: Suitable Drive Chain Equipment like electric motors, gearboxes (where applicable), fluid couplings (where applicable), flexible couplings and other accessories shall be provided for all the belt conveyors, various pumps of dust suppression system, fans for ventilation system, electrical hoists and other equipment's specified in this specifications. Various requirements as spelt out in the Technical Specifications for individual equipment

shall be taken into consideration while designing the associated drive chain equipment.

4.2 CODES AND STANDARDS: The design, manufacture, inspection and testing of Drive Equipment shall comply with all the currently applicable statutes, regulations and safety codes in the locality where the equipment in to be installed. The Drive Equipment's shall conform to the latest edition of the following standards and codes. Other internationally acceptable standards/codes, which ensure equal or higher performance than those, specified, shall also be accepted. Nothing in this specification shall be construed to relieve the vendor of the required statutory responsibility. In case of any conflict in the standard and this specification, the decision of the Engineer shall be final and binding.

IS:3688 : Dimensions for shaft ends.
IS:3681: General plan for spur & helical gears.
IS:7403 : Code of practice for selection of standard worm and helical gear boxes

4.3 DESIGN AND CONSTRUCTION REQUIREMENTS:-

4.3.1 GEAR BOXES: Gear Boxes shall be of sealed type and mounted on machined or ground surfaces. The gearboxes shall be designed for 24 hours continuous duty in very dusty conditions. For thermal and mechanical rating of the gearbox the data sheet shall be referred to. Gearboxes with cooling coils are not acceptable.

4.3.2 COUPLINGS:-

4.3.2.1 FLEXIBLE / RIGID COUPLINGS: Approved type of couplings shall be used for power transmission depending upon duty requirements. The design of the coupling shall be such that it can take shock and misalignment without sacrificing its efficiency. Geared type flexible coupling shall be used on low speed side for all conveyors and other drive chains where gear box is provided. Other couplings in the drive chains shall be either rigid or flexible type, depending upon the requirement of equipment design and shall be finalized during detailed engineering.

Sl. No.	**DATA SHEET**	**DRIVE EQUIPMENT**
(i)	**GENERAL:** Continuous Motor Rating (Name Plate Rating) at 50˚ Centigrade Ambient temperature for Electric motor.	
(a)	For conveyors of belt conveyor systems	*****120% of actual power at drive motor output shaft at specified design capacity.

(b)	Mono-rail hoists (travel and hoisting), elevators, all the drives in coal sampling units, various pumps of DS systems, service water systems, cooling water system, potable & Fire water system.	*110% of actual power requirement at drive motor output shaft at guaranteed (rated) capacity.
(c)	Ventilation Fans	*110% of actual power requirement at drive motor output shaft at guaranteed (rated) capacity. In case of belt drive, the efficiency of transmission shall be considered as 95%.
(d)	*****The actual power at drive motor output shaft shall be calculated after considering all the losses of down the line equipment's of the drive train.	
(ii)	**Drive Equipment Rating**	
(a)	For Conveyors	120% of actual design requirement
(b)	Other Equipment 1 x 100 % duty	120% of actual design requirement.
(c)	Other Equipment 2 x 50 % duty	110 % of actual design requirement.
(iii)	**DESIGN & CONSTRUCTION REQUIREMENT:-**	
	Gear Box:-	
	Type	
(a)	Below 30 HP	Helical, worm, bevel as per requirement without cooling coil.
(b)	Above 30 HP	Helical / bevel helical without cooling coil.
(c)	Service Factor minimum	Service factor of gear box shall be as per accepted engineering practice / manufacturer's recommendations.
(d)	Ambient temperature for Thermal rating	50ºC Minimum
(e)	Mounting	On Machined/Ground Surfaces.
(f)	Output Rating	(a) For belt conveyor systems Service factor of gear box shall be as per accepted engineering practice / manufacturer's recommendations. (b) For other equipment Service factor of gear box shall be as per accepted engineering practice / manufacturer's recommendations.
(g)	Duty	24 Hrs. Continuous

	Flexible Couplings	
(a)	Type	Geared coupling
(b)	Rating	Not less than Motor rating.

5.0 BELT CONVEYORS: The elevating gradient of belt conveyors shall be as per the layout of the existing arrangement. The conveyors at the Piparwar CHP-CPP are Conveyor no. 1019 and Conv. no. 1028. The above two Conveyors for washed coal transportation shall be as per IS:4776 Part I & II, IS: 8598 and IS 8531.

5.6.1 CONVEYOR FRAME: All technological structures for conveyor frames consisting of intermediate frames (stringers and short post) supporting the idlers, deck plates, bracing members, discharge and tail end structures are in the scope of work where ever desired for completeness of the conveyor gantries. All pulley frames like drive pulley frame, tail pulley frame, bend pulley frame and GTU pulley frame are also included in the scope of Work. All new installations, where ever required, shall be as per the existing conveyor frames as far as possible.

5.6.2 IDLERS:-

(i) Diameter, thickness of roller tubes and bearing bores for carrying idlers, return idlers, impact idlers shall be mentioned clearly for different widths to suit the duty condition. However, in no case, it shall be lower than the following :

(For 1019):-

(a) 45°, 3 Roll Troughing Idlers : 152 mm dia x 569 mm length.
(b) 45°, 3 Roll Weigh Idlers : 152 mm dia x 569 mm length**.**
(c) 45°, 3 Roll Impact Idlers: 159 mm dia x 569 mm length.
(d) 45°/22.5°, 5 Roll Impact Idlers: 159 mm dia x 339 mm length.
(e) 30°/60°, 5 Roll Impact Idlers: 159 mm dia x 339 mm length.

(For 1028):-

(a) 45°, 3 Roll Troughing Idlers: 127 mm, dia.x 496 mm length.
(b) 45°, 3 Roll Impact Idlers: 135 mm dia x 300 mm length.
(c) Impact Idlers: 135 mm dia x 496 mm length.
(d) 30°/60°, 5 Roll Impact Idlers: 135 mm dia x 300 mm length.

(ii) **IDLERS SPACING IN MM (MAXIMUM) (as per existing design):-** Troughing idler 1.2 meter, Return roller: 2.0 meter, Impact roller : 0.4 meter.

(iii) **BEARING FOR IDLER ROLLERS:** Carrying idlers (except the impact idlers) and their return idler shall be provided with suitable size single row deep groove ball bearing with C3 clearance and heavy duty type and the impact idlers with sealed heavy duty deep groove ball bearing shall be used. The life of the bearings shall be guaranteed for a minimum period of 30,000 working hours.

(iv) **IDLER SHAFT:** Idler shaft shall be made of EN-8 of BS:970 or C-35 of IS: 1570 or equivalent quality steel and suitable size for the duty requirement.

(v) **IDLER ARRANGEMENT**: The carrying idler set shall be supplied & installed as per the existing arrangements in both the conveyors no. 1019 & 1028 which generally consist of three rollers of equal lengths. The angle of inclination of side rollers to horizontal shall be 45^0.

(vi) **RETURN IDLERS**: The return idlers shall be supplied & installed as per the existing arrangements in both the conveyors no. 1019 & 1028 which are of following two types:

(a) 10°, 2 Roll V-Return Idlers.
(b) 1 Roll Flat Return Idlers.

(vii) **IMPACT PADS:** The impact Idlers shall be supplied & installed as per the existing arrangements in both the conveyors no. 1019 & 1028 which are of following three types:

(a) 45°, 3 Roll Impact Idlers,
(b) 30° / 60°, 5 Roll Impact Idlers,
(c) 45° / 22.5°, 5 Roll Impact Idlers.

(viii) **TRANSITION IDLERS**: The Transition Idlers shall be supplied & installed as per the existing arrangements in both the conveyors no. 1019 & 1028 which are of following type:

(a)Adjustable 3 Roll Transition Idlers(5° - 20°; 15° - 30°; 30° - 45°).

(ix) **WEIGH IDLERS:** The Weigh Idlers shall be supplied & installed as per the existing arrangements in conveyor no. 1019 which is of following type:

(a) 45°, 3 Roll Weigh Idlers.

(x) Clearance, gaps etc. for the carrying and return idlers shall conform to the IS: 8593-1977 to the extent possible. Length of individual rolls shall conform to IS: 1570 (Current).

(xi) The idlers shall be sealed and greased for life. Idler bearings shall be provided with suitable labyrinth seal on outer side and felt seal on inner side.

(xii) The bearing housing of idler shall be made of processed steel and shall be press fitted and shall preferably be completely welded with idler tube.

(xiii) Eccentricity/ Ovality of the idler shall be minimum and shall be mentioned specifically for various sizes and in no case it should exceed 0.8 mm at any point along the shell. Idler shall be made of ERW seamless tubes. The space for greasing shall be clearly indicated on the drawing and quantity should also be indicated. It should not be less than 16 cc approx. on either side of each idler. The friction factor of idlers shall not be more than 0.02.

(xiv) **IDLER BRACKETS:** The brackets for the carrying idlers shall be of rigid frame construction to withstand shock loads resulting from large lumps. It shall be made of formed sections. The brackets shall be identical with existing one.

(xv) The fixing arrangement of carrying and return idlers shall be such as to permit adjustment of the idler sets for purposes of belt training. Allowance for such adjustments should be provided on both side of the conveyor and the play shall not be less than 10mm on either side. All idlers shall be drop-in slot type. However, the existing system has to be considered.

5.6.3 REDUCTION GEARS: The gear box of both the Belt conveyor should be as per existing design and preferably same make gear box. The rating of the existing gear box used in 1019 and 1028 conveyor will be as under:

	1019	1028
No of Gear Box	3	1
Gear box Type	KZA	KZA
Gear Box Size	360	400
Power	176 kW	-
Input Speed	1430 RPM	-
Output speed	72.8 RPM	-

5.6.4 COUPLINGS: Suitable couplings, shall be used for power transmission depending upon the duty requirement. Type and size shall be decided by bidder appropriately, but it is advisable to use existing type of fluid couplings used in other conveyors. The existing model of the fluid coupling is voith562TVVS/562TVVSC-X. for both the Conveyors.

5.6.5 DRUMS:-

(i) **DIAMETERS:** All the drums shall be of welded steel constructions and statically balanced. Solid and discs shall be designed to give maximum strength. The diameters of the drums shall be as per IS: 8531 -1977. The machining tolerance of individual parts of the drum assembly should comply with IS:919 (Current). The diameter of the drum shall be maintained within the tolerance given in IS: 8531-1977. The out of roundness shall not exceed + 0.5% of the drum diameter.

(ii) Face widths of the drums shall be as per IS: 8531-1977.

(iii) Shell thickness of the drums shall be suitable for taking bending loads on the drums. The drive drum should be crowned and the shell thickness shall not be less than 12 mm. This shall not be less than 10mm for tail pulley & other drums.

(iv) **BEARINGS & PLUMMER BLOCKS:** All drums shall be provided with taper self-aligning ball bearings with taper sleeve for the shaft dia less than 70mm to suit loading conditions. For heavy duty conditions, where shaft diameter exceeds 70mm, spherical roller bearing shall be provided. Plummer blocks shall be of cast steel and provided with grease nipples for lubrication purposes. All heavy duty plummer blocks

shall be provided with four holding down bolts especially at drive and tail drums. All lubricating nipples shall be readily accessible without removing the guards. Bearings shall be protected against ingress of dust and moisture by providing suitable labyrinth/rubber seals on both sides. Life of the bearings shall not be less than 30,000 hours and the bearings shall be guaranteed for the same. The drums of same diameter shall have similar size and type of bearings.

e. **DRUM SHAFTS:** All drum shafts shall be of EN-8 steel as per BS-970 (Current) /C-40 steel as per IS:1570 (Current).

f. All drive drums shall be lagged. The lagging shall be done by vulcanized natural rubber. The thickness of the lagging shall be 12mm. The rubber lagging shall have V-type herring bone pattern grooves (6 mm wide x 6 mm deep.) The apex of the grooves shall be in the belt travel direction. Alternatively, herring bone profiled wear resistant rubber bars moulded with aluminium reinforcement shall be preferred for easy replacement. The rubber lagging shall have a minimum durometer hardness of 55 Deg. Shore A – scale. Counter sunk, copper rivets and vulcanization will be used to fix the lagging on the pulley.

g. All drums of conveyors shall have stiffeners except the tail drum and bend drums on lesser tension side.

(5.6.6) BED FRAME & FOUNDATION ARRANGEMENTS:-

(i) The drive unit consisting of motor, reduction gear shall have a common bed frame. The motor, reduction gear and the drive drums shall be properly aligned in the works of the manufacturer before the supply is affected. Suitable bracings, wherever necessary should be provided on the drive unit bed frame and super-structure.

(ii) The head drum unit, the take-up unit and the tail unit shall have suitable foundation arrangement. Suitable bracings shall be provided on the structures of these units wherever necessary.

(5.6.7) DECKING PLATE: Formed steel sheet decking plates to protect the bottom belt against spillage should be provided on the entire length of the conveyor. The thickness of decking plate shall not be less than 3.15 mm. The decking plate shall be provided throughout the length for full length of belt conveyor. The deck plate in existing installation should be provided wherever required in the existing installation.

(5.6.8) SKIRT PLATE: Centrally located skirt plates shall be provided at every loading point for a distance of 10 meters to prevent spillage. At their commencement, these plates shall be placed about two thirds of the belt width apart and they shall widen out in the direction of the belt travel. These plates shall be mounted to give clearance of at least 50mm from the belt surface and this gap shall be closed by a soft rubber strip fixed to the skirt plates by means of slotted holes to permit adjustment necessitated by wear. The rubber strips shall be approx. 12mm thick and 150mm wide. Pieces of conveyor belting shall not be used for this purpose. The skirts should flare slightly upwards from the chute to prevent the material from wedging.

(5.6.9) BELT CLEANERS:-

(i) Primary and secondary belt cleaners shall be provided suitable for mounting on the Head Pulley of the conveyor to remove heavy residual layers of sticky material. Primary belt cleaners shall be provided with polyurethane blade (having hardness of 90 + 50 shore A) mounted on a carrier assembly with 'elasto-mount' or similar system to facilitate automatic blade adjustment. The blades of secondary belt cleaners shall be made of special tungsten carbide tip with SS-304 base.

(ii) Belt cleaners shall have multi sprung blades with suitable inclinations to clean dirt layers efficiently and suitable sprung deflection on contact with an uneven surface on the belt. Each individual blade should have spring action so that constant contact with the belt is maintained while in operation. For automatic adjustment and to compensate the blade wear, the belt cleaner assembly should be mounted on 'elasto-mount' or similar suitable arrangement to ensure that constant contact between belt and blades is maintained.

(iii) The unit shall be supplied with a locking system to prevent cleaning component from touching the blade and damaging the same. The complete system shall be such that it can be installed on the conveyor's sub- frame by means of modular support mounts.

(5.6.10) HOLD BACK DEVICE: Integral hold back devices alongwith gear box shall be provided for preventing running back of the conveyor belt in loaded conditions due to power failure or otherwise.

(5.6.11) ACCESSORIES:-

(i) **PULL CHORD SWITCH**: For stopping the conveyor from any point along the conveyor length, pull chord switches shall be provided on one side of the whole conveyor length. This shall be totally enclosed, dust and vermin proof, cast metal unit with trip and reset levels mounted along the main walkway side at regular interval of 20 meters. The pull chord rope shall be of PVC sheathed GI wires.

(ii) **BELT SWAY SWITCH:** Totally enclosed dust & vermin proof belt sway switch shall be provided on both sides along the conveyor length at a regular interval of 50 meters. Belt sway switches shall also be provided near head drum, tail drum, drive drums. These switches shall be auto reset double contact type. One for advance indication on excessive belt sway and the other for tripping of the conveyor.

(iii) **ZERO SPEED SWITCH/BELT SEQUENCE SWITCH:** One number belt speed monitoring switch per conveyor shall be provided which will stop the conveyor in case of slipping or snapping of the belt or in case belt speed falling below 80% of the rated speed. These switches shall also serve as belt sequence switch for the preceding conveyor.

(5.6.12) GUARDING:-

(i) Guarding on the conveyor drive shall comply with the relevant latest Indian Standards. The guards shall be of expanded metal conforming to IS:412 (Current). The minimum clearance between the guard & moving parts & the size of opening in guarding shall be as follows:

Sl. No.	Size of Opening (In mm)	Minimum Clearance (In mm)
(i)	Not Exceeding 10	25
(ii)	Over 10 upto & including 15	65
(iii)	Over 15 upto & including 30	100
(iv)	Over 30 upto & including 40	125

Slots 30 mm wide suitably reinforced may be provided in guards for insertion of bars for cleaning. The minimum distance between any moving part of the conveyor and any part of the slot shall be 300 mm. Guards shall totally enclose all parts as far as practicable, prevent access to the part e.g. for in running belt, the guard around which an operator can put his arm shall extend at least 900mm from the belt. All surface and overhead conveyors will have a walkway of 1.2 m on both sides.

(5.6.13) COMPLIANCE WITH STANDARDS: The troughed belt conveyors shall comply with the relevant latest Indian Standard specifications. All components, materials and equipment used shall also comply with the relevant latest Indian Standards specifications and code of practices or in their absence, the BS/ DIN/ USA or equivalent International Standards, unless otherwise mentioned.

(5.6.14) CONVEYOR BELTING: The belting shall be suitable for operation under the duty conditions and comply with all relevant Indian Standards/Codes. For Belt Conveyor No.1019: 1600mm width , FR Grade, Steel Cord Beltings, 1120 kN/m, 8/5 mm, conforming to latest revision of IS 1891(part 5) 1993. For Belt Conveyor No. 1028: 1400 mm width, Rubber Belting, Strength (kN) should be greater than 1050 kN, 5/3mm, PN/EP construction, pre stretched, straight ply, skim quoted ,open ended, molded edge, M-24 Grade Rubber conforming to IS:1891(Part-I)-1994.

Detailed specification of belting is further available in NIT.

(5.6.15) CHUTES AND LINERS:-

(i) The chutes, will be fabricated from 10 mm thick MS Plates by electric welding as per relevant IS Codes of practices. These shall be provided with necessary stiffeners and brackets for supporting from the adjacent structures. The chutes will be provided with wear resistant synthetic/rubber liner on their wearing and impact bearing

surfaces. The minimum thickness of the synthetic/rubber liner shall be 40 mm and it shall have the shore hardness of 68 degree + 5 degree A. The liner plate shall be high pressure moulded to ensure uniform curing of thick sections. For all impact areas, the liner plates shall be of standard size and replaceable plate wise for ease of maintenance. For non-impact areas, where only fine particles of coal are supposed to fall should be lined with polymer liner plates of suitable thickness.

(ii) The liners shall be fastened with a flexible system to minimize instantaneous impact and hence reduce the wear rate. The fastening system will be either through bolting or stud welded belting for quick installation. For all impact areas the bolt heads will be protected by a rubber plug. The working atmosphere will be dusty temperature will range between 4 deg. C and 50 deg. C and relative humidity up to 100%.

(5.6.16) PAINTING: All mechanical parts shall be coated with antirust varnish. On completion of erection, the exposed steel and iron parts shall be given two coats of approved synthetic painting after primer coating. The paint for M.S. plates shall consist of one primer coat after perfect brushing and two finish coats. Normally, only the outside surface shall be finish painted. The surface to receive painting shall be scrapped and then thoroughly wire brushed to remove loose rust, mill scale, oil, grease etc., so that the painting may be performed uniformly and homogeneously. Care is to be taken to obtain minimum requisite film thickness.

(5.6.17) LUBRICATION: Pressure lubricating fittings and/or flat industrial button head type grease nipples of adequate size will be provided on all bearings and machinery parts requiring lubrication. Automatic feed lubricators may also be provided wherever needed. Extension tubing shall be provided for all points otherwise inaccessible from normal working floors to facilitate lubrication. The machinery parts requiring lubrication shall be adequately and properly lubricated at the time of installation of the equipment. Lubricants used shall conform to relevant BIS or equivalent acceptable standards.

(5.6.18) INSTALLATION & ERECTION:-

(i) All the mechanical and electrical equipment installation along with structural erection will be under the supervision of experienced, competent and qualified engineers in the respective field.

(ii) All installations of mechanical and electrical equipment along with structural & its accessories and materials shall conform to the Indian Electricity Rules, Factory Rules & relevant current Indian Standard specifications and code of practice. Where no Indian specifications are available, the same shall conform to BSS/DIN/ US/ any equivalent International Standards or generally accepted sound engineering practices.

(iii) All the mechanical & electrical equipment along with structurals & their accessories will be properly secured with proper locking and other means to avoid noise and vibration of the equipment and its different components.

(iv) All the equipment shall be given proper safety enclosures with sufficient moving space and all the rotating parts will be covered by suitable enclosures/ safety guards.

(v) Initial filling of oil and lubricant shall be done by the contractor as per the requirement of individual machine.

(5.6.19) EQUIPMENT COMPONENT DETAILS: In respect of all the mechanical/ electrical/ electronic equipment/ component, the bidder shall have to furnish their full technical details covering capacity, make, type, size, weight, quantity, performance parameters, specific technical features, descriptive pamphlets, past performance certificate, operational manuals, detailed circuit diagrams with components specifications., installation and maintenance manuals etc. as far as possible and as applicable. Drawings, pamphlets and literature of the main equipment shall be furnished along with the offer.

(5.6.20) DESIGN DATA:-

Sl. No.	**Particulars**	**Units**	**Conveyors**	
			1019	**1028**
1	Quantity	Nos.	One	One
2	Width (approx.)	mm	1600	1400
3	Troughing angle	Deg	45	45
4	Length (approx.)	m	356.73	494
5	Speed (approx.)	m/sec	3.5	3.2
6	Normal capacity	TPH	2500	2500
7	Lift (approx.)	m	53	5
8	Type of drive		Induction Motor	
9	Motor power	KW	200 (3 nos.)	280 (1 no.)
10	Synchronous speed	RPM	1500	1500
11	Anti roll back device (mechanical type)		YES	YES
12	Material to be conveyed		Coal	Coal
13	Bulk density of the material	t/m^3	1.1(for design purpose)	1.1(for design purpose)
14	Nominal lump size	mm	100	100
15	Anti roll back device (mechanical type)		YES	YES
16	Condition of material	Dry/ wet	Wet	Wet
17	Belt selected (i) Type of carcass. (ii) Belt Joint		ST1120 Steel cord	PN/EP

ANNEXURE -I

Following list of mechanical equipment are based on the drawings and initial installation of the two conveyors which were put on trial run during commissioning of the CHP-CPP. The list is only indicative of the overall requirement of the plant for the bidder to make a correct assessment of the work involved. However, the bidder should visit the site for an assessment of the quantum of work involved before bidding. The various items/components or equipment of the existing conveyors may still be of use which the bidder has to take into account before bidding. The bidder shall also include items which do not find mention in the annexure but is still required for revival of the two conveyors and its successful operation. The bidder shall supply equipment as per the model and Make given in the annexure below which is based on the initial installation of the plant. For dimensions and any other details, the bidder is advised to contact the Project officer, Piparwar CHP/CPP, Piparwar Area of CCL.

LIST OF MECHANICAL EQUIPMENT

Sl. No.	**Name & Specification of Equipment**
Main Technological Equipment & Conveyors Renovation and Complete Revival of Belt Conveyor 1019 receiving washed power coal from transfer station 1107.	
	Length : 356.73 m, Width : 1600 mm, Speed : 3.5 m/s, Capacity: 2500 TPH, Lift: 52.3 m (approx), Elevation : 14.32° approx.
1	Adjustable 3 Roll Transition Idlers(5 -20°; 15°-30°; 30°-45°), 152mm dia x 569mm length.
2	45°, 3 Roll Troughing Idlers : 152 mm dia x 569 mm length
3	45°, 3 Roll Weigh Idlers : 152 mm dia x 569 mm length**.**
4	45°, 3 Roll Impact Idlers: 159 mm dia x 569 mm length.
5	30°/60°, 5 Roll Impact Idlers: 159 mm dia x 339 mm length.
6	45°/22.5°, 5 Roll Impact Idlers: 159 mm dia x 339 mm length.
7	01 Roll Flat Return Idlers: 152 mm dia x 1850 mm length.
8	10°, 02 Roll V-Return Idlers: 127 mm dia x 840 mm length.
9	Dimensional Drawing of Idlers and Rollers uploaded separately.
10	Troughing Idler Bracket
11	45° / 22.5° 05 Roll Impact Idler Bracket
12	1 Roll Flat Return Bracket
13	V-Return Idler Bracket
14	Return Idler Bracket
15	Drive Pulley:800 mm dia x 1800mm F/W(Dual Drive type-002F), With Bearing & Plummer Blocks etc.Bearing No 23144 K. Drawing Uploaded.
16	Non-Drive Pulley:800 mm dia x 1800mm F/W, With Bearing & Plummer Blocks etc or Compatible. Bearing No 2223K..Drawing Uploaded
17	Bend Pulley:630 mm dia x 1800mm F/W, With Bearing & Plummer Blocks etc or

	Compatible.
18	Take up Pulley:630 mm dia x 1800mm F/W, With Bearing & Plummer Blocks etc or Compatible.
19	Tail Pulley Assembly: 650 mm dia x 1800mm F/W, With Bearing & Plummer Blocks etc or Compatible.
20	Base Frame & Other Accessories Compatible to above.
21	Steel Cord Beltings: ST 1120, 8mm/5mm, FR Grade Conforming to latest Revision of IS1891(Part 5) /1993.
22	Spraying pump, Complete with 440V, NFLP Electricals & Accessories. Discharge: 38 LPS, Head: 100 m, **Qty: 2 nos.**
23	Hot vulcanizing for jointing of 1600mm steel Cord belting with all accessories, 440 volt, Qty: one no.
24	Steel Rope for tensioning, diversion Pulleys, HT Bolts & Nuts and other materials which found inadvertently not accounted as per requirement.
25	Conveyor Trestles(Stringers) from tail Drum to drive structures. Total length of structure to be changed with new structure-171 m approx and 185.73 mtr of old structures to be reused for a total length of 356.73 mtr. consisting of Head Chute, Tail Structure, Belt Scrapers, Loop Take-up Trollies, Side Channel ISMC 150, Legs-ISMC 150 / ISA 110x110x10, ISMC 125, ISA65x65x8, ISA30x30x5 and other gantry support structural steel required etc including roofing sheets.. Structural Steel Work riveted, bolted or welded in built up sections, trusses and frame work including cutting, hoisting, fixing in position and applying one coat of Self priming surface tolerant Epoxy high build coating with Polyamido amine catalyst primer of approved make of 100 microns DFT and two coats of first quality Acrylic Polyurethane of total of 80 microns DFT (2 x 40 microns) paint.
Renovation and Complete Revival of Belt Conveyor 1028. The belt receives reclaimed coal from the Reclaimers and discharges onto Transfer Station 1107. Length : 494.0 m(Head to Tail), Width : 1400 mm, Speed : 3.2 m/s, Capacity: 2500 TPH, Lift: 11.3m(Approx),	
1	45°, 3 Roll Troughing Idlers: 127 mm, dia.x 496 mm length.
2	45°, 3 Roll Impact Idlers: 135 mm dia x 300 mm length.
3	Impact Idlers: 135 mm dia x 496 mm length.
4	30°/60°, 5 Roll Impact Idlers: 135 mm dia x 300mm length.
	Tube thickness (in mm): As per respective IS.127mm
5	01 Roll Flat Return Idlers: 127 mm dia x 1545 mm length.
6	10°, 02 Roll V-Return Idlers: 127 mm dia x 765 mm length
7	Carrying/Troughing Idler Bracket.
8	01 Roll Flat Return Bracket.
9	V-Return Idler Bracket
10	Return Idler Bracket
11	45°/22.5°, 5 Roll Impact Idler Bracket:
12	Drive Pulley: 800 mm dia x 1600mm F/W(Dual Drive type-004F), With Bearing & Plummer Blocks etc.
13	Non-Drive Pulley(Type-TCR):650 mm dia x 1600 mm F/W, With Bearing & Plummer Blocks etc or Compatible.
14	Bend Pulley(Type-026F):650 mm dia x 1600 mm F/W, With Bearing & Plummer

	Blocks etc or Compatible.
15	Take up Pulley(Type-TCR):650 mm dia x 1600 mm F/W, With Bearing & Plummer Blocks etc or Compatible.
16	Tail end Pulley (Type-TCR): 650 mm dia x 1600 mm F/W, With Bearing & Plummer Blocks etc or Compatible.
17	Base Frame & Other Accessories Compatible to above.
18	Rubber Beltings: 1400 mm Width, 1000kN/m, 5Ply, 5mm/3mm top/bottom Cover thickness.
19	PN/EP Construction, pre-stretched, straight ply, skim coated, open ended, moulded edge, M-24 Grade Rubber Conforming to latest Revision of IS:1891(Part 5) / 1993.
20	EOT Crane Capacity: 05 MT Complete with Electricals, **Qty: One no.**
21	Electromagnet complete to be fitted in the discharge with electrical with movable hoist. **Qty: One no.**
22	Steel Rope for tensioning, diversion Pulleys, HT Bolts & Nuts and other materials which found inadvertently not accounted as per requirement.
23	Conveyor Trestles (Stringers) from tail Drum to drive structures. Total length of structure to be changed with new structure-412 m approx. and 82 mtr of old structures to be reused for a total length of 494 mtr. consisting of Head Chute ,Tail Structure, Belt Scrapers, Loop Take-up Trollies, Side Channel ISMC 150, Legs-ISMC 150 / ISA 110x110x10, ISMC125, ISA65x65x8, ISA30x30x5 and other structural steel required etc including roofing sheets. Structural Steel Work riveted, bolted or welded in built up sections, trusses and frame work including cutting, hoisting, fixing in position and applying one coat of Self priming surface tolerant Epoxy high build coating with Polyamido amine catalyst primer of approved make of 100 microns DFT and two coats of first quality Acrylic Polyurethane of total of 80 microns DFT (2 x 40 microns) paint.

Skim coated plies are recommended for conveyor No.1028 having high material impact at loading points on the belts. The belting of the conveyors under the scope of the tender, should meet the following technical specifications:

Sl. No.		
(i)	Fabric Type	Polyester / Nylon
(ii)	Minimum factor of safety	10 for arriving at allowable Working tension
(iii)	Tension Utilization factor	80%
(iv)	Cover grade	M-24
(v)	Approx. thickness (Ply)	1.5-1.85 mm
(vi)	Approx. weight	32.00 to 34.00 kg/ linear meter

(vii)	Cover thickness	5 mm top/ 3 mm bottom, or as per specific design requirement whichever is more.

Belt shall have sufficient lateral flexibility so that it will suit the troughing angle requirement even when it is empty and also shall have sufficient lateral stiffness. Belt shall have sufficient longitudinal flexibility so that it can easily flex around different pulleys of the conveyor system. Belt shall have sufficient impact resistance to withstand impact at loading points and shall be mildew inhibited, edge protected, open end skim coated plies. The conveyor frame shall be complete with stools for supporting stringers. Holes for fixing the supporting stools shall be drilled on stringer channel for intermediate structures. Stools for support of conveyor frames shall consist of vertical supports with base plate to enable fixing of stools on foundation. The height of the stools shall be such as to give clearance between return roller and ground of at least 500mm. The base plates of the stools shall be suitably drilled for grouting. However, Conveyor frame etc. shall be completely revived as per original arrangement.

(5.7) BELTING:-

(5.7.1) STEEL CORD BELT - 1600 MM:-

(5.7.1.1) APPLICABLE STANDARD AND CODES: The belting shall be designed and manufactured unless otherwise specified in accordance with the latest revision of IS:1891 (Part-5)/1993, IS 15143:2002, DIN 22131, ISO-340. The belting shall also conform to DGMS Technical circular no: DGMS/Mech./Tech.Cir.(Approval) No. 03 Dhanbad, 13.02.2015, to supply all test reports with each consignment.

(5.7.1.2) DUTY CONDITION: The belting shall be heavy duty and shall be suitable for 24 effective working hours Operation per working day and 365 working days per year in coal mining environment laden with dust. It shall be suitable for installation over conveyor system having 45 degree freighting angle. It shall be suitable for operation at an ambient temperature from 5° C to 50° C and RH up to 100%. The belting shall have sufficient resistance against exposure to open sun, rain etc.

(5.7.1.3) CONSTRUCTIONAL FEATURE: The rubber cover belting of steel cord shall be with skim coated, open end molded edge construction. The belting shall primarily consist of one layer of longitudinal steel cord embedded in the resistant compounds. Additional tolerance reinforcement may be included. The steel cord have characteristics of high tensile strength in the longitudinal direction, high flexibility for increased fudge resistance and galvanized for better adhesion of cords to rubber and toughness and protection against corrosion. The steel cord shall be made of high quality carbon steel specially developed for use of belt and shall be of repute make. Cord manufactures certificate may be asked at the time of inspection. No cord joint shall be allowed in any reel of the belting. Cords will be

carried out before using the cords and the test certificate shall be submitted with the supply of the belting. The belt shall have sufficient longitudinal flexibility, so that can easily flex around different pulleys of conveyor. The belt shall have sufficient impact resistance to withstand impact at the loading points. The whole belt shall be cured or vulcanized together in accordance with the best manufacturing practices. The belt edges shall completely sealed against ingress of moisture.

(i) **PROTECTION AGAINST LONGITUDINAL CUTS (RIP):** To protect the belting against through cuts/ longitudinal cuts, continuous Nylon cords of suitable design & strength in transverse direction shall be provided on top of longitudinal steel cords. The cross cords shall be of sufficient strengths so as to protect the belt against any longitudinal cut. When a foreign material tries to longitudinally cut the belt, cross cords should offer sufficient resistance so as to protect the belt from ripping by tripping the drive system against preset overloads provided in the electrical system of conveyor.

(ii) **BELT COVER:** The belt cover shall be made of natural/ synthetic rubber as main material so that it is excellent in abrasion, impact and flexing and working suitable for surface operation. The rubber cover shall be extruded homogeneously in one sheet and should be made of multiple sheets. The tensile strength shall not be less than 17 Mpa as per IS: 1891 (Part-I) 1993, para-7 (amended upto date). The grade of cover shall be fire resistance type. The abrasion loss of the cover shall be as per DIN 53516 (amended upto date). The surface and edge of the finished belting shall be free from blisters, pattering and other defects and will be completely sealed against ingress of moisture. The belt shall be suitable for vulcanized joints.

(iii) **BELT LENGTH:** The total length of belting shall not be less than the specified length. The permissible tolerance on belt length shall be as per IS: 1891 (Part-I): 1994.

(iv) **BELT WIDTH:** The width of the belting shall be within (+) 1.5% and (-) 0% of the specified nominal belt width.

(v) **BELT THICKNESS:** The mean overall belt thickness shall be within (+) 1.5 mm and (-) 0.5 mm of the specified nominal belt thickness. The difference between any two measurements taken shall not exceed 10% of the mean Belt thickness.

(5.7.1.4)TECHNICAL PARAMETERS OF STEEL CORD BELTING (1600 mm, ST – 1120):-

Sl. No.	Description	Technical parameters
(i)	Width	1600 mm
(ii)	Type (Tensile Strength)	ST-1120
(iii)	Duty Condition	Heavy Duty
(iv)	Cover Thickness Top/Bottom	8 mm / 5 mm

(v)	Rubber Cover Grade, Fire resistance	To confirm ISO-340
(vi)	General Cover Standard to be followed	FR Grade as per ISO-340
(vii)	Cord diameter (mm)	3.7 mm
(viii)	Cord Pitch (mm)	12 mm
(ix)	No. of Cords	130
(x)	Cord Construction	7×7
(xi)	Abrasion loss of Rubber cover as per DIN 53516 (latest)	As per DGMS Circular No. 6 dtd. 6.9.01
(xii)	Adhesion Strength (cover to core)	As per DINS/IS International Standard (Latest Revision)
(xiii)	Elongation at Break - %	As per DINS/IS International Standard (Latest Revision)
(xiv)	Elongation at Break (%) of Rubber Cover	As per IS:15143-2002
(xv)	Surface Electrical Resistance (Max)	As per IS:15143-2002.
(xvi)	Drum Friction	As per IS:15143-2002.
(xvii)	Total Thickness in (mm)	16.7 (approx.)
(xviii)	Thickness of the bonding cover over the cord (mm)	0.5 mm
(xix)	Weight of belt per meter (nominal) kg/m	38.00 (approx)
(xx)	Tensile strength of cover compound (Mpa) min	17.0 Mpa
(xxi)	Hardness of cover compound	70 $\pm$ 5 IRHD (or equivalent)
(xxii)	Tolerance of cord pitch (mm)	As per DIN 22131
(xxiii)	Manufacturer of cord	Reputed make like Usha Martin/Fasten/GW(I)
(xxiv)	Reel length	200 M per reel.

(5.7.1.5) MARKING: The belting shall be permanently marked on the carrying side. The character height shall be 20 to 50 mm height. Each group of marking shall be parallel to the belt edge. The distance between marks will be not more than 5 meter and approx. 100 mm from the parallel to the belt edge. The marking shall be sufficiently durable.

Each marking shall include the following information:

(i) Designation of belting.
(ii) Grade of belting.
(iii) Thickness of top cover followed by bottom cover expressed in mm.
(iv) Manufacturer's serial number.
(v) Year of manufacturing.
(vi) Manufacturer's identifications or Trade mark.

(5.7.2) RUBBER BELTING:-

(5.7.2.1) APPLICABLE STANDARD & CODES: The belting shall be designed and manufactured, unless otherwise specified, in accordance with the latest revision of IS-1891 (PART-I & V): 1993 DIN – 53516 standard and other associated Indian, BS and relevant ISO - 340 standards.

(5.7.2.2.) DUTY REQUIREMENT: The belting shall be of extra heavy-duty type, capable of handling lumpy coal containing shale and sand stone and suitable for the round the clock operation in coal mining environment laden with surface run at high speed. The belting shall, therefore, be suitable for extra environment condition i.e. exposure to open sun and rain, temperature variation from 5 degree to 50 degree Celsius and relative humidity upto 95%. The basic parameter are given in the Technical Data Sheet.

(5.7.2.3) CONSTRUCTIONAL FEATURES: The belting shall consist of carcass having covers of fire resistant rubber. The carcass shall consist of either of one or more plies of woven fabric or of solid woven fabric and shall be impregnated with fire resistant rubber or plastic mix. The whole shall either be fused or vulcanized together in a uniform manner.

(i) **FABRIC:** The fabric used shall be made of Polyamide / EP or any other suitable synthetic material or combination thereof evenly and firmly woven and free from manufacturing faults as is normal in the best manufacturing practice. The fabric used shall be evenly and firmly woven and shall be free from foreign matter and such defects as knots, lumps and irregularities. The carcass used should be from reputed manufacturers like Madura coats, Sri Ram Fabrics etc.
(ii) **ELONGATION:** Nominal elongation should be 0.5%.
(iii) **BELT LENGTH:** The total length of belting shall be not less than the specified length. The tolerance on length on individual rolls shall be within (+) 2% and (-) 0.5%.
(iv) **BELT WIDTH:** The width of the belting shall be within (+) 1.0% and (-)

0% of the specified nominal belt width.

(v) **BELT EDGES**: The belting shall be with moulded edge construction.

(vi) **BELT THICKNESS MEASUREMENT: -** The difference between any two measurement taken shall not exceed 1 mm for a belt of which the mean belt thickness does not exceed 10 mm or 10% of the mean belt over 10mm thickness. The tolerance average carcass thickness, specified by the bidder, shall be (+/-) 0.5 mm for specified thickness upto and including 5mm and shall be (+/-) 10% for specified thickness over 5 mm.

(vii) **COVER THICKNESS:-** The average value of the cover thickness shall not fall below by more than 0.2 mm for Specified thickness up to including 4mm and shall not fall below by more than 5% for Specified thickness over 4 mm.

(viii) **FREE FROM DEFECTS:** The belting shall be straight when rolled out flat. The surface and edges of finished belting shall be free from blisters, pitting and other surface defects.

(ix) **ADHESION: -**

(a) **ADHESION BETWEEN COVER AND PLIES: -** The mean adhesion between cover and plies shall not be less than 4.50 KN/m width. The lower of the two minimum values of force from the two tests shall not be less than 3.70 KN/m.

(b) **ADHESION BETWEEN INDIVISUAL PLIES: -** The adhesion between the cover and the carcass and between adjacent plies (except in case of solid woven) shall be such that when tested in the manner described in the Annexure – G of IS 1891 (Part – I: 1993, the force required to cause the separation shall be as given in table 2 pertaining to "Force for adhesion Testing".

(x) **COVER RUBBER:** The rubber used in the top and bottom cover should be less abrasive and hardness should be 70 ± 5 on shore scale. It should be antistatic (FRAS) grade. The value of the tensile strength and elongation of Rubber cover when removed from the belt and tested as per method described in Annexure – B of IS 1891 (Part-I) 1993, shall not be less than the values as given below :-
Grade shall be "Fire Resistant Antistatic" (FRAS), Minimum Tensile strength shall be 17 Mpa, and Minimum elongation at Break shall be 350%.

(xi) **MARKING:** The belting shall be clearly marked on the carrying side. The character height shall be not less than 20 mm. The marking shall be repeated at a longitudinal spacing of 10 meters, at approximately 100 mm from the left and right edges of the belting alternatively.

The following identification mark shall be applied on the carrying side / thicker cover side of the belting:

(a) Manufacturer's identification.
(b) Belt type (Fabric Designation):
(c) Cover thickness of carrying and running side Cover Grade.
(d) Mark/batch number.
(e) Indian Standard Number.
(f) Month and year of manufacture.

(5.7.2.4) SAMPLING AND TESTING: -

(i) **SAMPLING:** Depending upon the length of conveyor belting of the same characteristics (i.e. type, width etc.) the sample shall be drawn in accordance with Table-I.

TABLE-I

Length	No. of Samples
Up to 500 m	1
501 m to 1000 m	2
1001 m to 2000 m	3
2001 m to 3500 m	4
3501 m to 5000 m	5
5001 m to 7000 m	6
7001 m to 10000 m	7

(ii) **RE-TEST AND REJECTION:-** In case the sample fails to comply with the specific test requirements, two additional samples shall be drawn and tested to check compliance with the specified requirements. In the event, any samples fails to comply with the specified requirements, the supply shall be rejected. If both the samples pass the tests, the supply shall be accepted. All cost for sampling and retesting shall be borne by the manufacturer.

(iii) **TESTING:-** Following tests shall be performed in the presence of owner/owner or his authorized representative:

(a) Fire resistant properties of the cover as per ISO-340.
(b) Drum friction test as IS 1891 (Part-V) of 1993.
(c) Maximum surface electrical, resistance as per IS 1891 (Part-V) of 1993.
(d) Cover abrasion loss (when tested as per DIN-53516) – 175 cu mm (Maximum).
(e) Belt width.
(f) Belt thickness.
(g) Cover thickness.

(h) Full thickness tensile strength (for manufactured as well as ageing).
(i) Percentage elongation at reference and breaking load.
(j) Cover adhesion.
(k) Cover adhesion loss.

In case the owner/owner is not in a position to witness the test, the supplier shall maintain adequate records of having carried out the tests and forward the test report to the owner/owner or inspecting agency/authority at the time of pre-dispatch inspection.

TECHNICAL SPECIFICATIONS FOR CHP/ PN/ EP BELTINGS:-

(i)	Belt width	1400 mm
(ii)	Carcass/construction	PN/EP
(iii)	WARP Material	Polyester
(iv)	WEFT Material	Nylon
(v)	No. of Plies	5
(vi)	Skim Gauge Between Plies (mm)	0.5
(vii)	Top Cover (mm)	6
(viii)	Bottom Cover (mm)	3
(ix)	Rubber Grade	FRAS
(x)	Belt Mass (kg/ linear meter)	32.00 to 34.00
(xi)	Approx. Elastic Modulus	11200 ± 5%
(xii)	Maximum Rise/ Lift	5 meter
(xiii)	Maximum Take-up/ Count. Weight (Te)	11
(xiv)	Bulk Density (Kg/m^3)	1100(For Design Purpose)
(xv)	Belt Speed (m/sec)	3.2 to 3.5
(xvi)	Edge	Moulded

5.8 SUPPORT SYSTEM FOR CONVEYOR 1019: Total conveyor length of 1019 SILO conveyor is 356.73 meter. In the existing system, there is a provision of 5 Nos steel seamless pipe supports from drive station to SILO loading to a approx length of 191 mtr. It is proposed to extend support of steel seamless pipe in the shape of "A" at the position mentioned as below:

Sl. No.	Support Name	Position	Total length of Pipe in Mtr	Spacing between two legs in mtr	Diameter of Pipe	Thickness of pipe
1	RT 1	In between PT1 and sampling Station.	27	6	508 mm	9.53 mm
2	RT2	In between sampling station and PT2.	42	9	508 mm	9.53 mm
3	RT3	In between PT2 and PT3.	52	11	508 mm	9.53 mm
4	RT4	In between PT3 and PT4.	66	13.5	508 mm	9.53 mm
5	RT5	In between PT4 and PT5	74	15.5	508 mm	9.53 mm
6	RT6	In between PT4 and PT5	76	16	508 mm	9.53 mm
7	RT7	In between PT5 and SILO	74	15.5	508 mm	9.53 mm

The foundation plate should not be less than 30 mm MS plate.

RCC Foundation for extra supports of conveyor 1019

Support name	Spacing between two pipes(in m)	Volume of RCC (in cum)	Wt. of Bars (in kg)
RT1	6	13.84	1384
RT2	9	14.92	1492
RT3	11	15.64	1564
RT4	13.5	16.54	1654
RT5	15.5	17.26	1726
RT6	16	17.44	1744
RT7	15.5	17.26	1726

The scope of work related to support system includes civil works for RCC foundation, supply & erection of steel seamless pipe and bottom cover at road cross-over with all fabrication works. In the Civil work, The RCC materials of 1:2:4 i.e., 1 cement:2 coarse sand : 4 graded stone aggregate 20mm nominal size, are to be used and the reinforcement for R.C.C work including straightening, cutting, bending, placing in position and binding all complete is to be done by hot rolled deformed bars. Deformed bars should not be less than 100 kg per cubic

meter. The two foundation of each support should be interconnected to each other by RCC casting of size 0.6 mtr X 0.6 mtr.

In addition to above, It is proposed to cover bottom of 1019 conveyor, between PT4 to PT5 through which road is passing to avoid spill over of materials from Top. This can be done by 50 mm X 50 mm X 6 mm MS angle and 3.15mm MS plate.

The foundation plate thickness should not be less than 30mm.

The plate of top fabricated rectangular support should be of thickness not less than 8 mm and fabricated to interconnect conveyor bottom structure and top of the pipe support.

However, during design &engineering, there may be slight variation in length of pipe, spacing between two legs and quantity of RCC works.

5.9 BELT WEIGHER: It is proposed to incorporate Belt Weigher beneath SILO loading conveyor 1019 at a suitable place and should be interfaced with the main control room for recording weighted result.

5.9.1 BASIC PARAMETERS:-

(i)	Capacity of weigher in tonnes/hr		:	2500 TPH.
(ii)	Max. lump size (mm)		:	100 mm.
(iii)	Bulk density (t/m^3)		:	0.8 to 1.15.
(iv)	Specific gravity		:	1.6. To 1.65.
(v)	Percentage moisture		:	20%.
(vi)	Angle of repose		:	35º.
(vii)	Ambient temp. (º C):-			
	(a)	Maximum	:	50ºC.
	(b)	Minimum	:	4ºC.
(viii)	Conveyor data:-			
	(a)	Conveyor description	:Nominal for 2700 TPH & Peak for 2900 TPH.	
	(b)	Belt width	:	1600 mm.
	(c)	Conveyor length(m)	:	As per system layout.
	(d)	Belt speed (m/sec)	:	4.8.
	(e)	Inclination of Belt	:	Horizontal/ Inclined.
	(f)	Troughing angle	:	45°.
	(g)	Carrying idler spacing	:	As per requirement.
	(h)	Location/type of weigher	:	Outdoor/ multi idler.
	(i)	Working condition	:	Dusty and Moist.
	(j)	Voltage available	:	As per requirement.

5.9.2 DUTY CONDITION: Belt weigher shall be of outdoor type. The equipment is to be installed on a horizontal portion of a belt conveyor and it will record the weight of coal moved through the conveyor system within permissible accuracy of ± 0.5%. The weight measured will be displayed and also printed on cards. The equipment should have inherent design features to work in dusty condition and fluctuating quantity of material coming through the belt conveyor system. The belt weigher should have facilities of digital display board, daily chart recorder for rate of flow, feed rate indicator, TPH and totalize for automatic recording and displaying of total material handled. The reading of the belt weigher should be displayed clearly in the main control room. The total quantity dispatched & the balance quantity available in ground bunker should be clearly displayed in the main control room. The overall unit should be robust, compact, simple and easily installable. It should be locally controlled as well as remotely controlled from the control room. The unit should not require constant attention, regular maintenance, or frequent calibration, and it should have a voltage stabilizer to take care of any voltage fluctuations. The sensor will be of suitable type and design to guarantee the desired weighing accuracy. A speed-sensing device will be provided with the systems as required. The display of quantities should be available locally as well as in the control room. Signals from the belt weighers installed within-feed conveyors to the bunker and loading conveyor to the silo will be fed to PLC to compare the in-coming quantity and out-going quantity and thereby getting the information regarding balance quantity available in the bunker.

5.9.3 CONSTRUCTIONAL FEATURES: In general, the equipment should be robust in nature and have inherent design features so as to give satisfactory performance in adverse loading conditions also. The belt weigher will be microprocessor based electronic type. It will be complete with all accessories required for its successful operation in the stipulated duty condition. It will inter-alia have the following specific features.

5.9.4 WEIGHING FRAME & SENSORS: Sufficient care should be taken in the fabrication and alignment of the weighing frame, which is to be supported using anti-friction ball bearing linkages, leverages etc. so as to facilitate a smooth movement of the weighing frame in vertical plane. It will have strain gauge type load cell/pendulum resistance type load sensing and speed sensing device of proper design to ensure satisfactory result.

5.9.5 SIGNAL CONDITIONER/INTEGRATOR: This forms the interface between the sensors and the control console. It incorporates the necessary multiplier integrator for the generation of speed signal and conversion of load signal into weight signal. The information about the speed of the conveyor is obtained from the speed-sensing device which is directly proportional to the belt travel. Since the control console in the case of electronic weighers is usually located at a place far away from the conveyor belt, it is desirable to transmit the load cell outputs after processing as a current signal rather than as a voltage signal. This is however, not applicable in the case of mechanical weighers.

5.9.6 RATE INDICATOR: The rate indicator is an automatic null balance potentiometer type servo indicator capable of accepting DC signals. The signal is further processed by necessary accessories and finally indicated by the position of the pointer of the potentiometer.

This gives a measure of voltage produced by transducer and is indicated as rate of flow in the case of electronic weighers. It is however, not applicable for mechanical or other type of weigher.

5.9.7 TOTALIZER: This is a real time integrator. Sufficient care should be taken in designing of integrating element and the time function generator since the long term accuracy of the equipment depends upon the quality of the integrating element and the stability of the time function generator. This performs the function of totalizing the quantity of material passed through it during a particular period of time, and the same can be recorded and numerically displayed.

5.9.8 CALIBRATION SET UP: This is a set up for checking the operational accuracy of the system which incorporates all the functional blocks, in terms of a 'Number' usually known as the ‘cal-figure'. Initially, immediately after commissioning the system, the cal-figure could be evaluated and recorded, so, the cal-figures displayed at later date could be compared with initial figures and the necessary adjustment effected to bring back the system to the original condition. The provision of this system should be elaborated in detail. The weigher shall be provided with a test chain for calibration. The range of weighment should be from 50% to 120% of rated capacity of respective conveyor belt.

5.9.9 DISPLAY AND OPERATOR CONTROL CONSOLES: The control console and display unit will be housed in a control room provided near the loading point. The weight indicator will be visual digital/analogue type and should be fully self-indicating. The indicator will be enclosed in dust and moisture proof housing and it should show at a glance the weight of material conveyed and also the rate at which material is being conveyed. The latter height should be such that it could be easily read from a distance. All the electronic circuitry of the weigher, as far as possible, should have printed card modular feature for easy replacement of defective control parts ensuring minimum down time of the equipment.

5.10 FREIGHT CUM PASSENGER LIFT:-

5.10.1 GENERAL REQUIREMENT: The industrial duty lift will serve the various levels at ground, different working floor levels of the receiving pit complex & at silo and any other levels as may be felt necessarily during detail engineering stage for efficient plant maintenance and operation. The lift will have the following operating parameters as per IS.

The lift shall have following operating parameters:

(i)	Type	-	Freight-cum-passenger lift.
(ii)	Capacity	-	408 Kg/1500 kg.
(iii)	Speed	-	As per requirement.
(iv)	Lift size	-	As per relevant IS.
(v)	No. of steps	-	As required.
(vi)	Quantity	-	02 nos. (01 no at Silo & 01 no at sampling station).

The lift shall be of sheet steel (16 SWG MS Sheet) construction with 5 mm thick heavy duty chequered floor and automatic stainless steel doors and shall be complete with UP/DOWN

ARROWS at all landings and with semi-dual (with/ without attendant) operation position indicator and battery operated alarm belt, necessary switches, brakes, push button, limit switches, safety gears etc . The design, supply and installation shall conform to the relevant Indian Standards and Codes of Practices. The machine room shall be located at the top of the lift shaft and the lift shall travel from ground to Silo top/ rec.pit floor with steps at intermediate floors as required and designed, constructed and installed in accordance with the latest version of the following standards:

(i) IS: 14665 (Part-1):2000 : Guidelines for Outline Dimensions.
(ii) IS: 14665 (Part-2,Sec-1&2) : Code of Practice for Installation, Operation & Maintenance.
(iii) IS: 14665 (Part-3,Sec1&2):2000 : Safety Rules.
(iv) IS: 14665 (Part-4,Sec-1to9):2001 : Components.
(v) IS: 14665 (Part-5:1999 : Specification, Inspection Manual.
(vi) IS: 732(Current) : Code of practice for electrical wiring installations.
(vii) IS: 2365(Current) : Steel wire suspension ropes for lifts, elevator & hoists.
(viii) IS: 8216(Current) : Guide for inspection of lift wire ropes

Besides the above, other internationally acceptable Standards, which ensure equal and higher performance & safety than those specified above, shall also be acceptable. Indian Electricity Act 2003, Indian Electricity Rules 1956. For lift, installation, operation and maintenance should be carried out in conformity with lift acts and rules in force. Conformity with Fire/Indian standard Specifications/ Regulations. The installations shall be carried out in conformity with local fire regulations and rules in force. All materials, fittings, appliances etc. used in electrical installations shall conform to Indian Standard Specifications.

5.10.2 TECHNICAL PARTICULARS OF PASSENGERS LIFT:-

SL. NO.	PARTICULARS	
(i)	Type	Freight-cum-passenger lift
(ii)	Number of lift(s) required	2
(iii)	Load –Kgs.	1500 Kg & 408 Kg
(iv)	Speed – m/sec	As per IS.
(v)	Travel – mtrs	From GL of Silo to Silo Top and from ground level of sampling station to upper plateform.

(vi)	Stops & Openings	As per requirement of design (All openings on the same side)
(vii)	Power Supply	415 Volts 3 phase, 50 Hz. Alternating Current
(viii)	Control	PLC Control
(ix)	Operation	Simplex. Full collective (with/ without Attendant)
(x)	Machine	Geared traction machine placed directly above hoist way in machine room
(xi)	Car Size (W X D) – mm	As per Requirement
(xii)	Hoist way required	As per Requirement
(xiii)	Car Panels	All plain powder painted panels
(xiv)	Handrails on 3 sides	M. S. Powder Painted – Black Matt
(xv)	False Ceiling	To be provided
(xvi)	Flooring	As per requirement
(xvii)	Car Entrance	Protected by centre opening sliding steel door in plain powder painted finish
(xviii)	Hoistway Entrances	Protected by centre opening sliding steel doors in plain powder painted finish
(xix)	Door operation	Automatic
(xx)	Signal details	(a) Combined luminous hall button and digital hall position indicator. (b) Integral full height car operating panel with luminous buttons digital car position indicator combined with direction arrows overload warning indicator and service cabinet. (c) Battery Operated Alarm Bell & Emergency Light. (d) Fireman's switch at main lobby. (e) Automatic Rescue Device

5.10.3 AUTOMATIC RESCUE DEVICE:-

(i) ARD is to be provided with battery back-up. The Automatic Rescue Device should operate automatically without any human intervention within a period of one minute, when the running lift suddenly stops due to power failure or system failure of the lift.

(ii) It should move the halted lift slowly and safely in upward or downward direction to reach the nearest floor/landing door and then to open the door automatically as well as to park the lift there with door open enabling the trapped passengers to exit.

(iii) Whenever the Power supply resumes during the running of the lift in ARD mode operation the lift should continue to run in the ARD mode until it reaches the nearest landing and the door are fully opened.

(iv) If the normal power supply resumes when the lift is at the landing, it should automatically be switched over to the normal power operation mode.

(v) All the safety devices of the lift should remain active during the ARD mode operation.

(vi) The device should have batteries for power back-up during the period of power failures. The back-up time should be enough to provide at least 6 (six) rescue operations within a period of 1(one) hour. Sealed maintenance free batteries should be used.

5.10.4 SAFETY: Full-length multi-ray (infra light curtain) Electronic door detector system. The car shall be equipped with an electronic door sensor which can detect an obstruction at the car entrances and control the closing of the doors. This prevents the passenger, wheeled stretcher and wheeled chair from getting bumped by the closing doors and relieves the user from holding down the OPEN button. The sensor shall scan for any object across the full height of the car entrance. The doors shall reverse immediately if the sensor detects any obstruction at the car entrances.

5.10.5 CAR: The car shall be enclosed on all sides by means of car body with centre opening sliding type door sliding horizontally and consisting of two panels with vision panel opening from the centre and so inter connected that they move simultaneously with provision of power operated device for opening and closing of doors. The enclosure shall be of sufficient strength to withstand thrust forces. The sides of car shall be lined with heavy gauge sheet panels properly braced and reinforced. The enclosure shall be flushed on the inside and securely fastened to the platform. The roof shall be covered with sheet metal. The construction of roof should be strong enough to be capable of supporting at least two persons. The car shall be equipped with fan with grills and suitable lighting complete with fittings and shall be provided with separate switches for fan and light. Provision shall be made for car door electrical contact, electrical and mechanical interlock, electro mechanical lock, emergency stop push button, floor selector and floor stopping switch.

5.10.5 HOIST WAY DOORS: The hoist way doors shall be horizontally centre opening steel sliding door with wide vision panel at each landing of dimension matching with car door.

5.10.6 DOOR HANGERS AND TRACK: Hangers and tracks for car door and each hoist way door shall be furnished. Suitable material shall be used to minimize noise. Rollers or equal arrangement shall be provided to take upward thrust of the doors. All required materials for landing entrance shall be provided.

5.10.7 OPERATION FOR CAR DOOR AND HOIST DOOR: The car door and the hoist way door shall open automatically when the car stops at landing. In case of power failure, the door operations shall be so designed that it can be opened manually from inside the car. The hoist way door shall not open automatically before the car reaches at landing level.

5.10.8 CONTROL, OPERATION AND INTERLOCK: The control system governing, starting, stopping, direction of motion, acceleration, speed and retardation and accessories required for satisfactory and trouble free operation, protection and control of the lift shall be provided. The lift shall be suitable for automatic operation by a momentary pressure of a button such that the lift car is set in motion and caused to stop automatically at any required landing.

The lift operation shall conform to the following requirements:

(i) The operation of the lift shall be through a push button station located inside the car.

(ii) The lift shall not move unless the car door, landing door and all other protected openings connected with control circuit are closed.

(iii) The push buttons, one for upward movement and the other for downward movement, at each terminal landing shall be provided in order to call the car.

(iv) The landing doors shall be inter-locked so that the landing door of any floor shall not open when the lift is not on that floor.

(v) Push button shall be fixed in the car for holding the doors open for any length of time. Provision shall be made for safety gear, terminal slow down switch, terminal stopping switch-normal, terminal stopping device-final.

5.10.9 CAR OPERATING PANEL: In the car, there shall be an operating panel containing push buttons, elevations of the landings served, two-position key-operated switch, marked to indicate “with attendant” and “without attendant”, an emergency stop switch, a buzzer, an emergency call button connected to a bell to serve as an emergency signal, push button or switches for lighting and fan, other push buttons, switches, etc. as required.

5.10.10 INDICATOR: The lift shall be provided with position indicator and call indicators inside the lift car to show the position of the lift car with reference to the floor numbers and the landing from which the call is being received. Up and down travel direction and position indicating signals shall be provided on each landing for the lift. Various indicators shall be of standard construction.

5.10.11 TERMINAL BUFFERS: The terminal buffers shall be provided for stopping the car and the counter-weight at the extreme ends of travel. Buffer support channels required to install the buffers shall be supplied.

5.10.12 LOAD PLATE: A load plate giving rated payload of the lift shall be fitted in the car in a conspicuous position. The rated load shall be given in kilograms and also in number of persons.

5.10.13 COUNTER WEIGHT AND COUNTER WEIGHT FRAMES: Counter-weight sections shall be mounted on structural metal frames so designed to retain the weight securely in its place. Counter-weight frames shall be guided on each rail guide by upper and lower guiding members attached to the frame. A substantial metal counter-weight guard of required length shall be provided at the bottom of the hoist way.

5.10.14 GUIDES FOR CAR AND COUNTER WEIGHT: Car and counter-weight guides shall be of rigid steel and shall be continuous throughout the entire lengths and shall be provided with adequate steel bracings and stiffeners. Guides for both car and counter-weight shall meet with the requirements of IS:14665 (current) Necessary lubrication device for guide rail shall be provided. Normal Terminal Limit Switch shall be provided to slowdown and stop the car automatically at terminal landings and final limit switches shall be provided to automatically cut-off the power and apply the brake, to stop the car travel beyond the terminal landings.

5.10.15 DRIVE MOTORS: The design ambient temperature for the equipment shall be taken as 50 deg. C. The insulation shall be Class E'. Necessary brakes shall be provided in the traction machine. Protective devices shall be provided on the controller to protect against phase reversal, low voltage and phase failure. Overload and other protective relays shall also be provided. Drive shall be AC Variable voltage, variable frequency (VVVF) with closed loop**.** The lift shall be driven by a squirrel cage TEFC induction motor to IP 55 protection and suitable for 120 Starts/hr. Motor and all electricals should have a dust proof sealing arrangement. The kW rating of main drive motor shall be selected keeping a minimum margin of 15% over maximum power requirement. The operation shall be Simplex Full collective control with/without attendant.

5.10.16 OTHER ACCESSORIES: All other accessories like switches, fuses, contactors, cables, etc. shall be provided as per requirement.

5.10.17 FIRE FIGHTING SYSTEM: Various fire fighting system shall be provided to protect plant from fire hazards. The design and installation of the system shall comply with the regulations of the Tariff Advisory Committee (TAC) of India/ National Fire Protection Association (NFPA), USA, Codes. The various fire fighting systems, facilities and the areas protected there by shall be as under:

(i) High pressure hydrant system : SILO complex,
(ii) Mobile/portable fire extinguishers : As explained at **(5.11.2) .**

5.11 SYSTEM DESCRIPTION:-

5.11.1 HIGH PRESSURE HYDRANT SYSTEM: Water from the reservoir shall be

pumped by adequate number of electric motor driven centrifugal pumps for the hydrant system. One diesel engine driven pump each shall be provided as a standby for the hydrant. The fire pumps shall be of the same capacity and suitable for parallel operation.

(i) The hydrant system shall consist of a large network of pipes which feed pressurized water obtained from fire water pumps to a number of indoor and outdoor hydrant valves.

The hydrant main remains pressurized at a pressure not less than 7 kg/cm2. In the event of a fire, the hydrants close to the seat of fire open, causing a drop in water pressure in the hydrant main which brings the hydrant pump into operation automatically, ensuring steady supply of water to the system. If the main pump fails to start initially, the standby pump comes into operation automatically. However, the pumps can only be stopped manually after ascertaining that the fire is extinguished. The fire pumps shall be of the same capacity and suitable for parallel operation.

(i) Total hydrants required shall be estimated as per TAC recommendations. Proposed locations of hydrants shall be shown in table and drawing.

(ii) The total water requirement of the hydrant system shall be met by suitable capacity pumps in accordance with the stipulations of the Fire Protection Manual of TAC considering the coal handling plant as ordinary hazard occupancy. The pump head shall be so selected that a minimum running pressure of 3.5 kg/cm² at a discharge head equivalent to half the aggregate pumping capacity is available at the hydraulically remotest hydrant point and a running pressure of 3.5 kg/cm² shall be available at a remote hydrant point.

(iii) Water for the hydrant system shall be handled by two pumps, one driven by an electric motor and the other driven by diesel engine. The pumps shall be horizontal centrifugal type drawing water from nearby sump.

(iv) The hydrant pump and sprinkler pump headers shall be connected through a stop valve and a non-return valve so that the hydrant pumps can supply water to the sprinkler circuit. However, the reverse shall not be possible.

(v) The number of hydrants shall be in accordance with TAC/NFPA regulations. A set of two lengths of 15 m hoses, a nozzle and a branch pipe shall be kept in hose boxes adjacent to each hydrant.

(vi) Hose houses shall be located at strategic places, each covering group of external hydrants. Each hose house shall have sufficient number of 15 m hoses, a branch pipe and nozzles in accordance with TAC/NFPA regulations.

(vii) Fog nozzles shall be used for spraying atomized hydrant water on electrical fires in a discontinuous fog jet to avoid electrical shocks.

(viii) The hydrant system shall be kept pressurized by jockey pump of suitable capacity to make up small system leakage and maintain pressure in hydrant and sprinkler system. Jockey pump shall cut in approximately at 0.35 kg/cm² drop and cut out at normal system pressure. Fire pumps shall be arranged to cut in approximately at 1 kg/cm² drop and cut out manually at churn pressure.

(5.11.2) PORTABLE/MOBILE FIRE EXTINGUISHERS: Various types of portable and mobile fire extinguishers shall be provided at strategic locations in the Plant for fire

protection. Location for portable/mobile fire extinguishers to be provided are as follows 1) Two Electrical Substations 2) Two Transfer points 3) One sampling station 4) one Silo station.
Two numbers of Portable fire extinguisher 4kg each, suitable for each application are to be installed in each station as mentioned above with provision of suitable hanging mechanism(all together 12 nos portable/mobile fire extinguishers of 4 kg each are to be provided).

(5.12) SAMPLING SYSTEM:-

(5.12.1) SCOPE: For determining the quality of coal dispatched by each rake there shall be provision of automatic sampling of coal from the coal streams of in feed conveyors to the silo. The sampling system shall conform to BIS / ISO / ASTM specifications and shall consists of a primary sampler fitted to each in feed conveyors and a primary sample belt feeder. The location of sampling station will be at the specified location**.**

(5.12.2) APPLICABLE STANDARDS AND CODES: The equipment shall be designed and manufactured in accordance with the latest revision of BIS. Where ever BIS are not available, British standard /American standard / DIN / JIS or any other equivalent superior standard shall be followed. Any amendment / revision in above standard that may be in force during the period of manufacture shall also be taken into consideration**.** Besides the above ,the equipment covered under this specification shall comply with the requirement of all latest applicable statutory acts ,regulations which may be in force during the period of execution and which are related with design construction and operation of the equipment in their location where it will be installed.

(5.12.3) DUTIES: The cutter device employed in the sampling system should have an opening minimum four times the top size of the material to be sampled. The sampling device should be designed to minimize disturbance of the coal flow while rotating / sweeping over the stream. The cutter shall rotate/sweep the material at a constant speed. There shall be one belt/chain feeder conveyor of min 650 mm to collect coal samples from each sample discharge chute and to convey the primary sampled coal to the sampling system.

(5.12.4) DESIGN AND CONSTRUCTION FEATURES:-

(i) There shall be 1(one) primary sampler cutter fitted at the SILO feed conveyor for sampling of coal.

(ii) The arm/structure of sampler cutter shall be fabricated with MS plates and lined with abrasion resistant stainless steel liner.

(iii) The sample cutter shall be suitably designed to extract representative Samples from the stream of coal of size up to (-)13 mm.

(iv) The type and size of the cutter speed shall be selected to suit the duty condition and these shall be clearly indicated in the offer separately for both the options.

(v) The cutter chute opening shall be minimum 4 times the coal size and it shall be of sufficient depth and designed to avoid any loss of sample.

(vi) The sample cutter shall pass through the stream always at right angles to the flow and must travel at constant speed.

(vii) The cutter arm shall be removable for wear replacement, there shall be no protruding bolts or obstructions on coal contacting surfaces and corners of the liner shall suitably reduced.

(viii) The primary sampler drive shall be direct motor drive of mechanical type.

(ix) Adequate means such as dust doors or baffle plates shall be incorporated to ensure the sample cutter is in the park position. Inspection doors to observe sample cutter action shall be provided and dust cover shall be of easily removable design.

(x) Frequency of sample increment shall be in accordance with BIS / ASTM/ DIN standard.

(xi) There shall be one belt / chain feeder conveyor of minimum width 650 mm to collect coal samples from each discharge chute and to convey the primary sampled coal to the sampler hopper.

(xii) The belt feeder shall be complete with head and tail sections.

(5.12.5) BASIC DATA:-

(i)	Type of Sampler Cutter	:	Sweep type.
(ii)	Type of cutter drive	:	Positive, mechanical drive.
(iii)	Motor power	:	As required for the System duty.
(iv)	Material construction	:	M.S. and replaceable stainless steel arm.
(v)	Arm rotation &constructional features: As per design requirement which facilitate no spillage during operation.		
(vi)	Mounting	:	Directly to conveyor with s
(vii)	trl. Steel.		
(viii)	Lump size to be handled	:	(-) 100 mm.

(5.12.6) The sampling system shall be provided with electrical control system with timers etc to provide for automatic start up. The sampling system shall be inter locked to the silo in feed conveyors. The electrical system shall be complete with motor control centre, relay panel control, console with graphic display and auxiliary equipment as per latest international practice.

(5.12.7) PRIMARY SAMPLE BELT FEEDERS: There shall be one conveyor of minimum 650 mm to collect coal samples from the discharge chutes. The feeder shall be complete with head and tail sections, drives, skirting, adjustable feed gate, infeed and outfeed sections, conveyor belting, etc. The complete system shall be designed to suit the duty requirement and to feed the metered amount of coal to the subsequent sampling stations without loss of fines or moisture. The belt conveyor shall be sealed by skirting at the feed point and totally enclosed.

(5.12.8) BIAS CONNECTIONS: There shall be bias connections in the chute between the belt feeder and crusher. This connection shall be utilized for collecting the primary sampled coal into the Employer' container.

(5.12.9) SAMPLE CRUSHER: The sample crusher module shall be designed to reduce from (-)100 mm size coal to 8 mesh without loss of fines as well as moisture. The crusher may be of single stage or double stage type, depending upon the type and size of crusher.

(5.12.10) SECONDARY SAMPLER: The crushed product shall be fed to the secondary sampling machine through a chute. The secondary sampler shall be designed to suit the duty requirement and shall be installed between the inter-connect chute works. The internal surface coming in contact with the coal stream shall be lined with abrasion resistant stainless steel liner plate. The sampler shall be complete with cutter Driver, flanged chute connections etc. The secondary sampler drive shall be designed to take a representative sample of the crusher discharge. The secondary sampler shall be modular type with self contained enclosure. Sample drive may be hydraulic or mechanical. The sampler cutter shall move through the angle stream at right angles to the flow areal and slot type feeders are not acceptable.

(5.12.11) SAMPLE COLLECTION: This shall be 8 (eight) stations rotary sample collector. The sample shall be collected in dust and moisture tight stainless steel containers with proper fittings for engagements and removals. The rotating table shall be driven by geared motor drive system.

(5.12.12) Reject Bucket Elevators: The rejected coal from the sampling system shall be fed back to the hopper through bucket elevator. The bucket elevators shall be of centrifugal discharge type having buckets bolted on elevator belting. The bucket elevator shall be complete with drive, motor, reduction gear box, head end tail pulley etc. One number screw conveyor with drive and other accessories shall be provided at the top to collect the reject from the bucket elevator and finally fed back to the respective conveyors.

(5.12.13) Sample System Chute: All chutes within the sampling system including reject elevator discharge chute to the hopper shall be fabricated from mild steel and lined with abrasion resistant triscal liner. All chutes shall have a minimum valley angle of 45 degrees.

(5.12.14) Sampling System Control: The sampling system shall be provided with electrical control system with timers etc. to provide for automatic startup. The sampling system shall be inter-locked to the infeed conveyor. The electrical system shall be complete with motor control centre, relay panel control or PLC based console with graphic display and other auxiliary equipment as per relevant standard and latest international practice.

(5.13) INSPECTION AND QUALITY CONTROL:-

(5.13.1) SPECIAL MATERIAL: The manufacturer should furnish during inspection, without extra charge, test certificates covering mechanical properties and chemical composition for special raw materials used including that of liners. The certificates should be from the approved testing laboratories like CMERI Durgapur, NPL New Delhi etc. If considered necessary, samples for such material and components may be selected as per IS : 1548 (current) by the employer's representative from amongst the raw materials and manufactured components of equipment and tested in the approved laboratory. In case samples so selected fail to meet the standard specifications, the whole lot of the manufactured components will be rejected and disqualified for use again for any CCL supplies.

(5.13.2) STAGE INSPECTION: The Employer reserves the right to carry out inspections at any stage of the process of manufacture and assembly for which all facilities will be provided by the manufacturer. Before carrying out such inspections, necessary advance information will be given to the manufacturer. Availability of standard specification Meters, Gauges, etc. for testing and inspection. The manufacturer will maintain all relevant standards and codes of practices for manufacture, inspection and testing of components of the equipment ordered. He will also maintain a set of meters and gauges etc. as may be required for testing and inspection of components.

(5.13.3) CHECKS DURING INSPECTION: The details of the checks to be carried for various components are to be submitted by the contractor for Owner's approval. However, some indicative checks on different items are given below which should necessarily form part of the quality assurance programme to be agreed with the Owner. All plates above 20mm thickness to be ultrasonically tested for laminations. Shaft forgings and castings to be checked for hardness, microstructure and ultrasonic testing in addition to check for chemical and mechanical properties

Following minimum NDT requirements to be ensured for welds:
(i) Butt welds: 10 % Ultrasonic / Radiographic and 100 % Magnetic particle.
(ii) Fillet welds: 10% Magnetic particle.

(5.14) MAINTENANCE & SAFETY:-

(5.14.1) SAFETY PRECAUTIONS AND PROVISIONS:-

(i) Access Handrails, intermediate rails and toe-boards shall be fitted to all sloping walkways and walkways from which a person is likely to fall a distance of more than 2 m on the side remote from the conveyors in addition to any handrail which may be required to guard the conveyor. The top rail shall normally be 1 m above the level of the walkways. A toe board shall be placed at floor level, on walkways and stairways. With respect to the height of toe boards attention is drawn to the requirement of legislation relevant to the application. Access underneath the conveyor, where the clearance is greater than 700 mm and less than 2 m or where there is a danger of person falling into an open space shall be prevented by suitably placed rails. Where access is allowed underneath the conveyor guarding shall be provided.
(ii) Guards shall be provided at all nip points where belts wrap around pulley and at nip points occurring at accessible carrying and return idlers at or near convex curves and at other points where an upward movement of the belt may be restricted by means other than the load (such as at loading points chutes and skirt plates).Guards shall either prevent access to the nip point or extend at least 1 m from it.
(iii) Guards shall be provided at and shall totally enclose, rotating shafts and couplings, chains and chain wheels, gears and power transmission belts and pulleys. Guards may be of perforated or imperforated construction and shall be of adequate rigidity and strength for the

situation in which they are employed if of perforated construction, they shall comply with the requirements of 1.4&1.5. If any openings are provided for the insertion of cleaning bars they shall comply with the requirement of 1.4 If any openings are provided for the insertion of cleaning bars they shall comply with the requirements of 1.5 Guards shall be securely fixed in position and shall be capable of being removed and replaced without dismantling any other part.

(5.14.2) SIZE OF MESH OR OPENINGS (OTHER THAN FOR CLEANING BARS) AND CLEARANCE: Perforate guards may be manufactured from perforated sheet, expanded metal woven wire, metal lattice or similar materials and the openings in such guards (other than for the insertion of cleaning bars) and the minimum clearance between the guards and any moving parts shall be in accordance with the requirements of table given below:

(5.14.3) OPENING FOR CLEANING BARS: Slots not exceeding 30 mm wide and suitably reinforced, may be provided in guards for the insertion of bars for cleaning. The minimum distance between any moving part of the conveyor and any part of the slot shall be 300 mm.

Sl. No.	**Size of opening**	**Minimum clearance**
(i)	Not exceeding 10 mm	25
(ii)	Over 10 mm up to and including 13 mm	65
(iii)	Over 13 mm up to and including 30 mm	100
(iv)	Over 30 mm up to and including 38 mm	130
	Size of opening	

(5.14.4) MARKING OF CONTROLS:-

(i) All controls shall be marked with the words appropriate to the function they control, such as stop, start, forward, reverse, raise or lower. Arrows indicating the direction of travel control shall be provided at all forward and reverse controls.

(ii) **Location of signs:** Each stop control shall be readily accessible and shall be indicated by a standard or uniform type signs erected in suitably conspicuous positions and shall have letters not less than 15 mm high.

(iii) For pull cord controls, signs shall be erected at suitably and clearly visible positions along the length of the conveyor, or at any other location where pull cord is installed, at intervals not greater than 30 m apart and labeled Conveyor Stop.

(iv) **Communication:** Suitable means for communication from each conveyor head end and junction tower to various offices shall be provided.

(5.14.5) SAFETY GUARDS :-

(i) Guards shall be designed to prevent injury to persons and shall be provided at every dangerous part of equipment normally accessible to personnel. They shall be designed to form part of the equipment and shall not in themselves create hazards.

(ii) Guards shall be provided to prevent accidental contact by persons or parts of clothing being caught in equipment. All guards shall comply fully with the requirements of the relevant statutory authority.

(iii) All sheet metal guards shall be aluminum. All guards shall be painted safety yellow.

(iv) Lifting handles or lugs shall be provided where required for the safe removal or opening of guards.

(v) The tops of coupling guards and brake guards shall be readily removable by hand by one person without the use of tools

(vi) It shall be possible to inspect brakes for adjustment, lining wear, etc., without prior removal of brake guards being necessary.

(vii) Name plates, warning signs or other data affixed to drive components shall not be obliterated or covered by parts of the guards.

(viii) Where removal of the guard is infrequent for inspection or maintenance purposes, it shall be fixed in position so that it cannot readily be removed without the use of tools.

(ix) Fixed guards shall be provided where the equipment can be serviced without the removal of the guards. Removable guards or removable inserts to fixed guards shall be installed where normal maintenance, "V" belt tension inspection or cleaning is carried out. These shall be installed in a manner acceptable to the relevant Statutory Authorities and shall be clearly labelled: **"DANGER ISOLATE DRIVE BEFORE REMOVING GUARD".** Design and construction of guards, personnel reach dimensions and acceptable distance between guards and danger points shall be as defined by relevant standards or statutory requirements.

(x) Where required for inspection or maintenance purposes, hinged inspection doors may be provided in the guard, hinged in such a way that there will not be a tendency for the door to be left in the open position.

(xi) Guards shall provide for tachometer access to rotating shafts.

(xii) Guards with any dimensions in excess of 1800 mm shall be easily assembled in component parts that do not exceed 60 Kg mass. All component parts of the guard shall interlock together to form a rigid and safe assembly.

(xiii) Guards on conveyors shall be designed, constructed and installed in accordance with relevant Indian Standard.

(xiv) Solid sheet metal guards shall be provided for all fluid couplings which are provided with fusible plugs. A catch tray having a capacity of at least 125 % of the maximum fluid capacity of the coupling shall be provided beneath the guard and coupling. Should guard ventilation be necessary, this shall be provided on the opposite side to the fusible plug. Other sheet metal guards shall be provided with at least one mesh panel at the upper part of the guard to allow ventilation and inspection of the guarded components. Location of this panel shall not allow water drip or splash to

enter the guard. V- belt guards shall have solid edges and mesh sides to ensure V-belt ventilation.

(5.14.6) SAFETY AND IDENTIFICATION SIGNS:-

(i) Safety and identification signs shall be placed on all equipment, conveyors and work areas. All signs shall be painted with luminous paint on 2.5 mm minimum thickness brass or stainless steel sheet.

(ii) Identification signs shall be bold lettering (minimum of 50 mm high) on a white background. Each item of equipment shall be clearly identified with a minimum of two signs.

(iii) Conveyors shall also have signs to identify (These signs shall be located on both sides of the conveyor)

- (a) Head location.
- (b) Tail location.
- (c) Take up mass tones.
- (d) Drive number.
- (e) Conveyor number at 20 m intervals along the conveyor.

(iv) All equipment and work areas shall have signs for :

- (a) Hearing protection.
- (b) Warning that equipment may start without notice.
- (c) High voltage.
- (d) Eye protection.

(5.14.7) MAINTENANCE FACILITIES IN CONVEYOR SYSTEM:-

(i) Sufficient space shall be provided for replacement of pulley by lifting it vertically above its mounting. In case of constraint of head room sufficient space shall be provided on the non driving side of the pulley so that the replacement of the pulley can be done from that side of the pulley. In such case minimum clear space shall be equal in the length of the pulley over its shaft plus 500 mm.

(ii) A minimum 1000 mm clear space around drive mechanism shall be provided.

(iii) A suitable platform near expansion joint gallery for inspection and maintenance of supporting rollers and connected parts.

(5.14.8) HOISTING MECHANISM:-

(i) Hoisting mechanism shall be used in activities such as replacement over haul of drive pulleys, gear boxes, motors, etc. the mechanism shall be appropriate for handling different heights.

(ii) At the tail end of the conveyors a suitable lifting beam shall be provided.

(iii) Suitable lifting facility at inter- mediate locations along the conveyor shall be provided if required.

(iv) Lifting beam shall be provided above the take-up pulley of vertical gravity take-up unit

(v) The individual weights of the take-up unit shall be easily replaceable by manual effort and shall not weigh more than 50 Kg. each.

(5.14.9) REPLACEMENT OF BELTS:-

(i) The methodology of replacement of belts in conveyor system shall vary for different layouts. Sufficient space behind the tail end shall be provided so that the new belt can be spread their suitably. In place where spreading of belt would not be necessary provision for anchoring the stand (for keeping the roll of the belt) shall be made. The roll stand shall be designed taking into consideration the width of the belt, the maximum diameter of the roll and the maximum weight of the roll.

(ii) Idlers and guide rollers shall be provided behind tail pulley, counter weights structures and opening through which the new belt would enter the gallery to ensure smooth mounting and minimizing possibility of damage to the new belt

(iii) The suspenders of the counter weights of the take up units shall be located at a distance not less than belt width plus 100 mm.

(iv) In case of underground conveyor and other conveyors, where ever required suitable opening matching with the centre line of the conveyor shall be provided for introducing the new belt and removal of used belt.

(5.14.10) GENERAL PROVISIONS:-

(i) Suitable provision for suppression and extraction of dust shall be made.

(ii) The design of the bearing blocks and the side cover permit visual inspection of the bearings

(iii) Suitable inspection schedule for preventive maintenance shall be furnished.

(iv) Provision of Sump, Pump for dewatering of underground premises and suitable sweep chutes for disposal of fine dust from the floors shall be made.

(i) **(5.15) ELECTRIC MOTOR**: Suitable foot/flange mounted, heavy-duty, continuous rated with frequent start stop in quick succession type squirrel cage induction motor/s to meet the power requirement of drive unit shall be provided. The motor/s should be able to run in a dusty and humid environment, at an ambient temperature of 50ºC and the degree of protection should conform to IP55. The motor/s should conform to IS: 325. The motor should comply with latest version of IS:325 and IEC 34-1, IS: 1231 Dimension of three phase foot mounted induction motors, IS: 210 Frames for rotating electrical machines, IS: 2253 Designation for type of construction and mounting arrangement for electrical machines or equivalent international standard with class "F" insulation. The motor shall have high starting torque.

(5.15.1) GENERAL REQUIREMENTS:-

(i) For the purpose of design of equipment/systems, an ambient temperature of 50 deg. Centigrade and relative humidity of 95% shall be considered. The equipment shall operate in a highly polluted environment.

(ii) All equipments shall be suitable for rated frequency of 50 Hz with a variation of +3%& - 5%, and 10% combined variation of voltage and frequency.

(iii) Vendor shall provide fully compatible electrical system, equipments, accessories and Services.

(iv) All the equipment, material and systems shall, in general, conform to the latest edition of relevant National and international Codes & Standards, especially the Indian Statutory Regulations.

(v) The auxiliary AC voltage supply arrangement shall have 3.3 kV and 415V systems. It shall be designed to limit voltage variations as given below under worst operating conditions:

(a) 3.3 kV +/- 6%.

(b) 415/240V +/- 10%

(vi) The voltage level for motors shall be as follows :-

(a) Upto 0.2 KW : Single phase 240V AC / 3 phase 415V AC.

(b) Above 0.2 KW and upto 200 KW : 3 phase, 415V AC.

(c) Above 200 KW: 3 phase, 3.3 kV AC

(vii) Fault level shall be limited to 40 KA RMS for 1 second for 3.3kV system and 45 KA RMS for 1 second for 415 V system shall be solidly grounded and 110 VDC system shall be isolated type.

(viii) Paint shade shall be as per RAL 5012 (Blue).

(ix) The responsibility of coordination with electrical agencies and obtaining all necessary clearances shall be of the contractor.

(x) Degree of protection for various enclosures as per IS:13947 shall be as follows :-

(a) Indoor motors - IP 54.

(b) Outdoor motors - IP 55.

(5.15.2) CODES AND STANDARDS:-

(i) Three phase induction motors : IS:325, IEC:60034.

(ii) Single phase AC motors : IS:996, IEC:60034.

(iii) Crane duty motors : IS:3177, IEC:60034.

(iv) DC motors/generators : IS:4722.

(5.15.3) TYPE:-

(i) **AC Motors:-**

(a) Squirrel cage induction motor suitable for direct-on-line starting.

(b) Crane duty motors shall be slip ring/ squirrel cage Induction motor as per the requirement.

(ii) **DC Motors :** Shunt wound.

(5.15.4) RATING

(i) Continuously rated (S1). However, crane motors shall be rated for S4 duty, 40%

cyclic duration factor.

(ii) Whenever the basis for motor ratings are not specified in the corresponding mechanical specification sub-sections, maximum continuous motor ratings shall be at least 10% above the maximum load demand of the driven equipment under entire operating range including voltage and frequency variations

(5.15.5) TEMPERATURE RISE:-

(i) **Air cooled motors**: 70^0C by resistance method for both class B&F insulation.

(5.15.6)OPERATIONAL REQUIREMENTS:-

(5.15.6.1) STARTING TIME:-

(i) For motors with starting time upto 20 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 2.5 secs. more than starting time.

(ii) For motors with starting time more than 20 secs. and upto 45 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 5 secs. more than starting time.

(iii) For motors with starting time more than 45 secs. At minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be more than starting time by at least 10% of the starting time.

(iv)Speed switches mounted on the motor shaft shall be provided in cases where above requirements are not met.

(5.15.6.2) TORQUE REQUIREMENTS:-

(i) Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque.

(ii) Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.

(iii) Starting voltage requirement 85% of rated Voltage upto 150 KW motors.

(5.15.6.3) DESIGN AND CONSTRUCTIONAL FEATURES:-

(i) Suitable single-phase space heaters shall be provided on motors rated 30KW and above to maintain windings in dry condition when motor is standstill. Separate terminal box for space heaters & RTDs shall be provided.

(ii) All motors shall be either Totally enclosed fan cooled (TEFC) or totally enclosed tube ventilated (TETV) or Closed air circuit air cooled (CACA) type

(iii) Winding and Insulation

(a) Type : Non-hygroscopic, oil resistant, flame resistant.

(b) Starting duty : Two hot starts in succession, with motor initially at normal running temperature. However, conveyor motors shall be suitable for 3 consecutive hot starts followed by one hour interval at standstill with

maximum 20 starts per day and minimum 20,000 starts during life time of motor.

(c) 240V AC	:	Class B or better.
415V AC	:	F Class or better.
3.3KV AC	:	H Class or better.

(d) Short circuit rings of conveyor motors shall be either jointless or welded type. Brazed joint is not acceptable.

(iv) Motors with heat exchangers shall have dial type thermometer with adjustable alarm contacts to indicate inlet and outlet primary air temperature.

(v) Noise level for all the motors shall be limited to 85 dB(A) except for BFP motor for which the maximum limit shall be 90 dB(A). Vibration shall be limited within the limits prescribed in IS:12075 . Motors shall withstand vibrations produced by driven equipment.

(vi) Motor body shall have two earthing points on opposite sides.

(vii) The spacing between gland plate & centre of terminal stud shall be as per Table-I.

(viii) All motors shall be so designed that maximum inrush currents and locked rotor and pullout torque developed by them at extreme voltage and frequency variations do not endanger the motor and driven equipment.

(ix) The motors shall be suitable for bus transfer schemes provided on the 3.3 KV/415VThe size and number of cables (for LT motors) to be intimated to the successful bidder during detailed engineering and the contractor shall provide terminal box suitable for the same.

(x) The ratio of locked rotor KVA at rated voltage to rated KW shall not exceed the following (without any further tolerance) except for BFP motor.

Upto 110 KW	:	11.0 .
Above 110 KW & upto 1500 KW	:	10.0.

(5.15.6.4) TYPE TESTS:-

(i) **LT Motors**: LT motors shall be of type tested quality. For each type & rating of LT motors rated above 50 KW, the contractor shall submit for Owner's approval the reports of all the type tests as per relevant standards and carried out within last five years from the date of bid opening. These reports should be for the tests conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client. In case the Vendor is not able to submit report of the type test(s) conducted within last five years from the date of bid opening, or in case the type test report(s) are not found to be meeting the specification requirements, the Vendor shall conduct all such tests under this contract free of cost to the Owner and submit the reports for approval. All acceptance and routine tests as per the sp0ecification and relevant standards shall be carried out. Charges for these shall be

deemed to be included in the equipment price.

TABLE – 1

Sl. No.		
DIMENSIONS OF TERMINAL BOXES FOR LV MOTORS		
	Motor MCR in KW	As per relevant IS.
	UP to 3 KW	
	Above 3 KW - upto 7 KW	
	Above 7 KW - upto 13 KW	
	Above 13 KW - upto 24 KW	
	Above 24 KW - upto 37 KW	
	Above 37 KW - upto 55 KW	
	Above 55 KW - upto 90 KW	
	Above 90 KW - upto 125 KW	
	Above 125 KW-upto 200 KW	
	Note: Minimum inter Phase and Phase – earth air clearances for LT motors with lugs installed shall be as follows:	
	Motor MCR in KW	**Clearances in T-bones**
	UP to 110 KW	10 mm
	Above 110 KW and upto 150 KW	12.5 mm
	Above 150 KW	19 mm

(6.0) TRANSFORMER: 2 No 11 KV/415V, 750 kVA transwitch unit catering all loads of Rapid loading system and one No of 11 KV/ 3.3kV, 1.5 MVA suitable transformer for 4214 substation of vector group DYN11, Type of cooling: ONAN shall comply to following Indian standards:

(i) IS 2026 - Part I to V – power transformers. IS 335 - Transformer oil.
(ii) IS 10028 (Part II & III) - Installation and Maintenance of Transformers. IS 2099 - Bushings.
(iii) IS 2705 - Current Transformers.
(iv) IS 6600 - Guide for loading of oil immersed transformers.

(**6.1) TAPPING**: Tap changing device shall be provided on H.V side, circuit type, externally hand operated with necessary indications for tap position and locking arrangement at any of the tapping positions. It shall have the following steps: ± 2.5% ± 5%

(6.2) FITTINGS: The transformer shall be complete with the following fittings: -

(i) Oil conservator with oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above.
(ii) Off circuit type tap changer with position indicator and locking arrangement for all transformers.
(iii) Thermometer pocket with plug for all transformers of capacity 100 KVA and above.
(iv) 100 mm dial type /stem type thermometer with metal guard Dial type thermo-meter may have max. temperature indicator and resetting device for all transformers of capacity 250 KVA and above.
(v) Lifting lugs for all transformers.
(vi) Bi-directional /Unidirectional Rollers to be specified.
(vii) Rating diagram and terminal marking plate for all transformers.
(viii) Explosion vent for all transformers of capacity 400 KVA and above.
(ix) Additional Neutral separately brought out on a bushing for earthing for all transformers.
(x) Earth terminals (2 Nos.) for body earthing for all transformers.
(xi) Valves for filtration, drainage and filling etc. with necessary plugs for all transformers.
(xii) Radiator assembly for all transformers.
(xiii) Silica gel breather for all transformers.
(xiv) Air release plug for all transformers.
(xv) Facility to connect up Buchholz relay for all transformers of capacity 800 KVA and above.
(xvi) Inspection covers on tank cover for access to terminal connections for all transformers.
(xvii) Bushing terminations or cable box terminations as specified.
(xviii) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

(7.0) CONTROL CABLES:-

(7.1) CODES & STANDARDS: All standards, specifications and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions as on date of opening of bid. In case of conflict between this specification and those (IS : codes, standards, etc.) referred to herein, the former shall prevail. All the cables shall conform to the requirements of the following standards and codes :

(i) IS :1554 –I PVC insulated (heavy duty) electric cab les for working voltages upto and including 1100V.
(ii) IS : 3961 Recommended current ratings for cables.
(iii) IS : 3975 Low carbon galvanised steel wires, formed wires and tapes for armouring of cables.
(iv) IS : 5831 PVC insulation and sheath of electrical cables.
(v) IS : 8130 Conductors for insulated electrical cables and flexible cords. IS : 10418 Specification for drums for electric cables.

(vi) IS : 10810 Methods of tests for cables.

(vii) ASTM-D – 2843 Standard test method for density of s make from the burning or decomposition of plastics.

(viii) I

EC-754 (Part-I) Tests on gases evolved during combustion of electric cables. IEC-332 Tests on electric cables under fire conditions. Part-3:Tests on bunched wires or cables (Category-B).

(7.2) TECHNICAL REQUIREMENTS:-

(i) The cables shall be suitable for laying on racks, in ducts, trenches, conduits and underground buried installation with chances of flooding by water.

(ii) Cables shall be Armored, flame retardant, low smoke (FRLS) type designed to withstand all mechanical, electrical and thermal stresses develop under steady state and transient operating conditions as specified elsewhere in this specification.

(iii) Conductor of control cables shall be made of stranded, plain annealed copper.

(iv) PVC insulation shall be suitable for continuous conductor temperature of 70 deg C and short circuit conductor temperature of 160 deg. C.

(v) The cable cores shall be laid up with fillers between the cores wherever necessary. It shall not stick to insulation and inner sheath. All the cables, other than single core unarmored cables, shall have distinct extruded PVC inner sheath of black colour as per IS: 5831.

(vi) For multicore armored cables, the armoring shall be of galvanized steel as follows:

Sl. No.	Calculated nominal dia of cable under armor.	Size and Type of armor
(i)	Upto 13 mm	1.4 mm dia GS wire
(ii)	Above 13 upto 25 mm	mm 0.8 mm thick GS formed wire / 1.6 mm dia GS wire
(iii)	Above 25 upto 40 mm	0.8 mm thick GS formed wire /2.0mm dia GS wire
(iv)	Above 40 upto 55mm	1.4 mm thick GS formed wire/2.5mm dia GS wire
(v)	wire Above 55 mm upto 70 mm.	1.4mm thick GS formed wire / 3.15mm dia GS wire.
(vi)	Above 70 mm.	1.4 mm thick GS formed wire / 4.0 mm dia GS wire.

The gap between armor wires / formed wires shall not exceed one armor wire / formed wire space and there shall be no cross over / over-riding of armor wire / formed wire. The minimum area of coverage of armoring shall be 90%. The breaking load of armor joint shall not be less than 95% of that of armor wire / formed wire. Zinc rich paint shall be applied on armor joint surface. 2.07.00 Outer sheath shall be of PVC as per IS: 5831 and grey in colour. In addition to meeting all the requirements of Indian Standards referred to, outer sheath of all

the cables shall have the following FRLS properties.

(a) Oxygen index of min. 29. (As per IS 10810 Part-58).
(b) Acid gas emission of max. 20% (As per IEC-754-I).
(c) Smoke density rating shall not be more than 60% during Smoke Density

Test as per ASTMD-2843.

(vii) Cores of the cables of upto 5 cores shall be identified by colouring of insulation. Following colour scheme shall be adopted.

1 core - Red, Black, Yellow or Blue
2 core - Red & Black
3 core - Red, Yellow & Blue
4 core - Red, Yellow, Blue and Black
5 core - Red, Yellow, Blue, Black and Grey

For cables having more than 5 cores, core identification shall be done by numbering the insulation of cores sequentially, starting by number 1 in the inner layer (e.g. say for 10 core cable, core numbering shall be from 1 to 10). The number shall be printed in Hindu-Arabic numerals on the outer surfaces of the cores. All the numbers shall be of the same colour, which shall contrast with the colour of insulation. The colour of insulation for all the cores shall be grey only. The numerals shall be legible and indelible. The numbers shall be repeated at regular intervals along the core, consecutive numbers being inverted in relation to each other. When the number is a single numeral, a dash shall be placed underneath it. If the number consists of two numerals, these shall be disposed one below the other and a dash placed below the lower numeral. The spacing between consecutive numbers shall not exceed 50 m.

7.2.1 In addition to manufacturer's identification on cables as per IS, following marking shall also be provided over outer sheath:

(a) Cable size and voltage grade - To be embossed.
(b) Word 'FRLS' at every 5 metre - To be embossed.
(c) Sequential marking of length of the cable in metres at every one metre - To beembossed / printed.

The embossing / printing shall be progressive, automatic, in line and marking shall be legible and indelible.

All cables shall meet the fire resistance requirement as per Category-B of IEC-332

7.2.2 Allowable tolerances on the overall diameter of the cables shall be +\-2 mm maximum

over the declared value in the technical data sheets.

7.2.3 In plant repairs to the cables shall not be accepted. Pimples, fish eye, blowholes etc. are not acceptable.

7.2.4 Cable selection & sizing Control cables shall be sized based on the following considerations:
(i) The minimum conductor cross-section shall be 1.5 sq.mm.
(ii) The minimum number of spare cores in control cables shall be as follows: No. of cores in cable Min. No. of spare cores 2C, 3C NIL 5C 1 7C-12C 2 14C & above 3

7.2.5 Cable lengths shall be considered in such a way that straight through cable joints are avoided.

7.3 CONSTRUCTIONAL FEATURES: 1.1 KV Grade Control Cables shall have stranded copper conductor and shall be multi core PVC insulated, PVC inner sheathed armored FRLS, PVC outer sheathed conforming to IS: 1554. (Part-I).

7.4 CABLE DRUMS:-

(i) Cables shall be supplied in non-returnable wooden or steel drums of heavy construction. The surface of the drum and the outer most cable layer shall be covered with water proof cover. Both the ends of the cables shall be properly sealed with heat shrinkable PVC/ rubber caps secured by 'U' nails so as to eliminate ingress of water during transportation, storage and erection. Wood preservative anti-termite treatment shall be applied to the entire drum. Wooden drums shall comply with IS: 10418.

(ii) Each drum shall carry manufacturer's name, owner’s name, address and contract number, item number and type, size and length of cable and net gross weight stencilled on both the sides of the drum. A tag containing same information shall be attached to the leading end of the cable. An arrow and suitable accompanying wording shall be marked on one end of the reel indicating the direction in which it should be rolled.

(iii) The standard drum length for control cables shall not be less than 1000 metres. The length per drum shall be subjected to a maximum tolerance of +/- 5% of the standard drum length. The Employer shall have the option of rejecting cable drums with shorter lengths. For each size, the variance of total quantity, adding all the supplied drum lengths, from the ordered quantity, shall not exceed +/- 2%.

7.5 TESTS:-

(i) All equipments to be supplied shall be of type tested quality. The Contractor shall submit for Owner's approval the reports of all the type tests as listed in this specification and carried out within last five years from the date of bid opening.

These reports should be for the tests conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client.

(ii) In case the Contractor is not able to submit report of the type test(s) conducted within last five years from the date of bid opening, or in case the type test report(s) are not found to be meeting the specification requirements, the Contractor shall conduct all such tests under this contract free of cost to the Owner and submit the reports for approval.

(iii) All acceptance and routine tests as specified below and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price.

7.6 TYPE TESTS: The reports for the following type tests shall be submitted for one size of control cables :

Sl. No.	**Type Test Remarks**
For Conductor	
(i)	Resistance test
For Armor Wires / Formed Wires (If applicable)	
(i)	Measurement of Dimensions
(ii)	Tensile Test
(iii)	Elongation test
(iv)	Torsion test For round wire only
(v)	Wrapping test F or aluminium wires/ formed wires only.
(vi)	Resistance test.
	Mass of zinc Coating test For GS wires/formed wires only.
	Uniformity of zinc coating
For GS wires/formed wires only	
	Adhesion test For GS wires/formed wires only For
	PVC insulation & PVC Sheath
	Test for thickness
	Tensile strength and elongation test before ageing and after ageing.
	Ageing in air oven
	Loss of mass test For PVC insulation and sheath only.
	Hot deformation test For PVC insulation and sheath only.
	Heat shock test For PVC insulation and sheath only
	Shrinkage test
	Thermal stability test For PVC insulation and sheath only.
	Oxygen index test For outer sheath only.
	Smoke density test For outer sheath only.
	Acid gas generation test For outer sheath only.
For completed cables	

	Insulation resistance test(Volume resistivity method).
	High voltage test
	Flammability test as per IEC-332 Part-3 (Category-B)

7.7 Indicative list of tests/checks, Routine and Acceptance tests shall be as per Quality Assurance & Inspection table of Control Cables.

8.0 POWER CABLE:-

11 KV/3.3 KV GRADE CABLE OF SUITABLE SIZE:-

Technical specifications for PVC insulated 3.3 kV Power cables with Copper Conductors.

(a) **SCOPE**: Specification covers the design, manufacture, testing, supply and delivery in proper packed condition of 11 KV/3.3 kV grade, PVC insulated, PVC sheathed, Galvanized double steel wire armoured, PVC outer sheathed by extrusion, **Cu conductors** power cables for use in mining areas of CCL.

(b) The cable shall be ISI marked.

(c) **APPLICABLE STANDARDS:** The cables shall confirm to IS: 1554 (Part II)/1988 for 11 KV/3.3 KV Cu -with latest amendments. The references of standards in respect of conductors, galvanized steel wires, PVC Insulation and sheath, Cable tests, cable drum etc shall be in accordance with as laid down in IS: 1554 (Part II)/1988.

(d) **CABLE IDENTIFICATION**: Manufacturer's Name or Trade mark, Voltage grade, Nominal section & Material of conductor and number of cores, Year of manufacture, Inscription for length of cables at 1.0 meter interval, Type of insulation i.e. PVC shall be embossed on the outer sheath for the identification.

(iii) LT CABLE OF SUITABLE SIZE:-

Technical specifications for PVC insulated 1.1 kV Power cables with Copper Conductors.

(a) **SCOPE**: Specification covers the design, manufacture, testing, supply and delivery in proper packed condition of 1.1 kV grade, PVC insulated, PVC sheathed, Galvanized double steel wire armoured, PVC outer sheathed by extrusion, **Cu** power cables for use in mining areas of CCL.

(b) The cable shall be ISI marked.

(c) **APPLICABLE STANDARDS:** The cables shall confirm to IS:1554 (Part I)/1988 for 1.1 KV Cu -with latest amendments. The references of standards in respect of conductors, galvanized steel wires, PVC Insulation and sheath, Cable tests, cable drum etc shall be in accordance with as laid down in IS:1554 (Part I)/1988 or latest.

(d) **CABLE IDENTIFICATION**: Manufacturer's Name or Trade mark, Voltage grade, Nominal section & Material of conductor and number of cores, Year of manufacture, Inscription for length of cables at 1.0 meter interval, Type of insulation i.e. PVC shall be embossed on the outer sheath for the identification.

9.0 VACCUM CIRCUIT BREAKER: Circuit Breakers as listed below required for use on the primary side of Power transformers as detailed in above sections. The protection provided should be suitable for restricted earthed neutral system. The switch gear is for outdoor installation. General atmosphere will be dust prone and humid. The breaker should be manually spring charged, push button operated type.

9.1 GENERAL: The Circuit Breaker is meant for use in a system with the following:

(i)	Breaker type	:	Vacuum.
(ii)	Normal system voltage	:	11 KV
(iii)	Phase	:	3
(iv)	Frequency	:	50 C/s.
(v)	Neutral Earthing	:	Restricted Earthed neutral system.
(vi)	Type	:	Outdoor (KIOSK).
(vii)	Basic current rating	:	200 A.
(viii)	Symmetrical Breaking Capacity	:	25 KV for 3 sec.
(ix)	Short time rating	:	3 Seconds.
(x)	Class of insulation	:	BIL as per latest IS.
(xi)	Operating mechanism	:	Manual operated spring charge: Sec 9.20.7.
(xii)	C.T. Ratio	:	As above.
(xiii)	P.T. Ratio	:	As above.
(xiv)	Tripping and auxiliary supply	:	Shunt trip through 110 V DC.

9.2 MAIN COMPONENTS:

(i) Switch gear shall be with protective device, instrument panels, incoming and outgoing, bushings, core balance current transformers, horizontal isolation and horizontal withdrawal type.
(ii) Interlocking devices.
(iii) Voltage transformer with current limiting resistors and fuses.
(iv) Indicating devices.
(v) Current transformers.
(vi) Wiring for measurement and control circuit.
(vii) Busbar chamber.
  (a) Frame earthing.
  (b) Safety interlocks.

9.3 PROTECTION: Make EE/Rey-Roll/JVS & other reputed company.

(i) Combined IDMT overload relay with settings adjustable between 50% and 200% and high set instantaneous 500% to 2000%.
(ii) Earth fault relay: Setting 10% to 40%.
(iii) Differential Protection Relay suitable for 11 KV.

(iv) Instantaneous earth leakage relay with sensitive CBCT (Rating 5 Amps of primary leakage current), setting 20%- 100%, visual indicator, test and reset arrangements.
(v) Auxiliary relay for Bucholz trip and alarm facility.
(vi) Instrument panel: This shall be provided in the low voltage compartment accompanied with hinged door and shall be completed with CTs and the followings:
    (a) Ammeter & Voltmeter with selector switches.
    (b) Scale: Suitably scaled.
    (c) MEASURING INSTRUMENT:
        (i) KW Meter.
        (ii) P.F. Meter.
        (iii) KWH Meter .
    (d) Indicating lamp for ON/OFF and healthy trip indication with push button.
    (e) Test terminal block for testing facility.
    (f) Auxiliary relay for Bucholz (trip and alarm) and alarm accept facility.

9.4 CONSTRUCTION: The units housing of the circuit breakers & trucks shall be of fabricated steel construction. The unit shall be of horizontal with draw able pattern with horizontal isolation. Enclosure should be of sheet steel and should have undergone rigorous process of rust preventing comprising alkaline degreasing, descaling in dilute sulphuric acid and should be painted with 2 coats of red oxide primer and 2 coats (Finishing) coating of paints.

9.5 BUSBAR CHAMBER : The busbar shall be of hard drawn copper complying with the requirements of relevant IS and shall be separated on suitable insulating material at sufficiently close intervals to prevent busbar sag and able to withstand electro-magnetic stresses in the event of short circuit. The cross section of busbar should be adequately rated. The busbar should be air insulated and completely separated from other parts of the unit.

9.6 SAFETY INTERLOCKS: Each switchgear unit shall be provided with the mechanism of mechanical& Electrical interlock which shall automatically facilitate a fixed sequence of events designed to protect the equipment and operator from the danger of mal-operation.

9.7 SAFETY SHUTTERS: Each group of bus bar and feeder spouts shall be fitted with an automatically operated safety shutters. For testing and inspection, each shutter shall be separately hand operated from the front of the unit and shall be locked either in open or closed position.

9.8 VOLTAGE TRANSFORMER: Voltage transformer shall be 3 phase, 11 KV, 11KV/110V with current limiting resistance and fuses on HV and LV side. The potential transformer shall be of suitable capacity of 160 VA per phase to meet the requirement of the metering / protective circuits, operating and tripping circuits of the switch Gear.

9.9 TRIPPING: All circuit breakers shall have shunt trip fed from 110V DC source, DC

Power for trip circuit should be obtained from the potential transformers and rectified. The source of DC power should from a part of switch and inherent.

9.10 TERMINALS : Bare porcelain HT bushing for incoming and outgoing as per relevant Indian Standards.

9.11 FRAME EARTHING: The earthing of the breaker tank, moving portions and non-current carrying structures should be provided, through integral earthing & 2 Nos. earthing bolts.

9.12 OVERALL DIMENSIONS: The overall dimensions should be kept to minimum to facilitate minimum electrical clearance and accessibility for maintenance purposes as per IS/IE Rule. The minimum distance required withdrawing the circuit breaker for servicing /maintenance etc. shall also be provided.

9.13 DRAWING: The complete set of wiring diagram for the entire switch gear shall be provided in duplicate with the supply for convenience of installation of the switches at site. The Schematic single line diagram showing general arrangement of the switch gear and its panel shall be incorporated with the offer. schematic diagram of instruments panel, CTs, PT, Control circuit and protective circuit for the incoming and outgoing switchgear shall also be provided.

9.14 TEST REPORT: VCB must be tested at CPRI /Govt. recognized testing agency. The test report shall be of offered model of VCB for test duty 1, 2, 3, 4 and 5 as per IS and for 25 KA for 3 Sec. The owner/owner reserves the right to check the associated test reports any times during work period.

9.15 MOTOR CONTROL CENTRES AND DISTRIBUTION BOARDS: NFLP Switch board panel of 440 V with one incomer of 1200 A ACB (CTR – 800 / 5 A) comprising of one incomer Air Circuit Breaker and multiple outgoing MCCBs as required for operation should be provided. The item is required for renovation/refurbishment of substation no:4215. The Boards/MCC shall comply with the latest version of IS 8623 & IEC 439-1 except where modified or extended by this specification and with the relevant parts of standards mentioned below.

9.16 STANDARDS: The other relevant standards applicable are as under:

(i) IS :13947 LV switch gear and control gear.
(ii) IS :10118 Code of practice for selection, installation and maintenance of switchgear and control-gear.
(iii) IS :4237 General requirements for Switchgear and Control gear for voltages not exceeding 1000 V.
(iv) IS :6875 Switches and push-buttons.
(v) IS :13703 LV fuses for voltages not exceeding 1000 V AC.

(vi) IS :13703 LV fuses for voltages not exceeding 1000 V AC IS :12021 Specification of control transformers.
(vii) IS :2705 Current Transformers IS :3156 Voltage Transformers.
(viii) IS :11353 Guide for uniform system of marking and identification of conductors and apparatus terminals
(ix) IS :2147 Degree of protection provided by enclosures for low voltage switchgear and Control gear.
(x) IS :3043 Code of practice for earthing.
(xi) IS :6005 Code of practice of phosphating iron and steel.
(xii) IS :3202 Code of practice for climate proofing of electrical equipment IS :2629 Hot dip galvanising.
(xiii) IS :5082 Wrought Aluminium and Aluminium alloys for electrical purposes IS :722 A C Electricity Meters.
(xiv) IS :1248 Electrical Indicating instruments.
(xv) IS :3231 Electrical relays for power system protection
(xvi) IS :5 Colors for ready-mixed paints and enamels.
(xvii) IS :1554 PVC insulated cables for working voltages up-to and including 1100V IS :2551 Danger Notice Plates.
(xviii) IS :8544 AC motor starters of voltage not exceeding 1000 volts IS :8686 Static Relays CEA Regulations

9.17 CONSTRUCTIONAL DETAILS OF SWITCHBOARDS/MCC:-

(i) All Switchboards, i.e., 415 V Switchgears, Motor Control Centers (MCCs), A.C. Distribution Boards (ACDBs) shall be of metal enclosed, indoor, floor-mounted, free-standing type. Each panel shall comprise one or more of the modules mentioned in Annexure-A1.
(ii) All switchboard frames and load bearing members shall be fabricated using suitable mild steel structural sections or pressed and shaped cold-rolled sheet steel of thickness not less than 2.0 mm. Frames shall be enclosed in cold-rolled sheet steel of thickness not less than 1.6 mm. Doors and covers shall also be of cold rolled sheet steel of thickness not less than 1.6 mm. Stiffeners shall be provided wherever necessary. The gland plates thickness shall be 3.0 mm (minimum) for hot/cold rolled sheet steel and 4.0 mm (minimum) for nonmagnetic material.
(iii) All panel edges and cover/door edges shall be reinforced against distortion by rolling, bending or by the addition of welded reinforcement members. The top covers of the panels should be designed such that they do not permanently bulge/bend by the weight of maintenance personnel working on it.
(iv) The complete structures shall be rigid, self-supporting, free from flaws, twists and bends. All cutouts shall be true in shape and devoid of sharp edges.
(v) All switchboards shall be of dust-proof and vermin-proof construction and shall be provided with a degree of protection of IP 52 as per IS:2147. However, the busbar chambers having a degree of protection of IP 42 are also acceptable where continuous busbar rating is 1600 A and above. Provision shall be made in all

compartments for providing IP 52 degree of protection, when circuit-breaker or module trolley has been removed. All cutouts shall be provided with synthetic rubber gaskets. The switchboards which are meant for outdoor duty shall be provided with degree of protection of IP 54 as per IS:2147.

(vi) Provision of louvers on switchboards would not be preferred. However, louvers backed with metal screen are acceptable on the busbar chambers where continuous busbar rating is 1600 A and above.

(vii) All switchboards shall be of uniform height.

(viii) Switchboards shall be easily extendable on both sides by the addition of vertical sections after removing the end covers.

(ix) Switchboards shall be supplied with base frames made of structural steel sections along-with all necessary mounting hardware required for welding down the base frame to the foundation/steel insert plates. The base frame height shall be such that floor finishing (50 mm thick) after erection of the switchboards does not obstruct the movement of doors, covers, withdraw-able modules etc.

(x) All switchboards shall be divided into distinct vertical sections (panels), each comprising of the following compartments.

(a) **BUSBAR COMPARTMENT:** A completely enclosed bus bar compartment shall be provided for the horizontal and vertical busbars. Bolted covers shall be provided for access to horizontal and vertical busbars and all joints for repair and maintenance which shall be feasible without disturbing any feeder compartment. Auxiliary and power busbars shall be in separate compartments.

(b) **SWITCHGEAR/FEEDER COMPARTMENT:** All equipment associated with incomer or outgoing feeder shall be housed in a separate compartment of the vertical section. The compartment shall be sheet steel enclosed on all sides with the withdraw-able units in position or removed. Insulating sheet at rear of the compartment is also acceptable. The front of the compartment shall be provided with the hinged single leaf door with captive screws for positive closure.

(c) **CABLE COMPARTMENT OR CABLE ALLEY:** A full-height vertical cable alley of minimum 175 mm width shall be provided for power and control cables. Cable alley shall have no exposed live parts and shall have no communication with busbar compartment. Cable terminations located in cable alley shall be suitably shrouded to prevent accidental contact by falling of tools etc. For distribution boards, the partition between the feeder compartment and cable alley made of FRP sheet may also be offered. It shall be of such construction as to allow cable cores with lugs to be easily inserted in the feeder compartment for termination. Wherever cable alleys are not provided for distribution boards, segregated cable-boxes with complete shrouding for individual feeders shall be provided at the rear for direct termination of cables in each individual feeder. For circuit breaker external cable connections, a separately enclosed cable compartment shall also be acceptable. The Contractor shall furnish suitable plugs to cover the cable openings in the partition between feeder compartment and cable alley, for at least 50% of the total number of feeders. Cable alley door shall be hinged.

(d) **CONTROL COMPARTMENT:** A separate compartment shall be provided for relays and other control devices associated with a circuit breaker.

(i) Sheet steel barriers shall be provided between two adjacent vertical panels running to the full height of the switchboard, except for the horizontal busbar compartment. Synthetic rubber gasket shall be provided between the panel sections to avoid ingress of dust into panels. Each shipping section shall have full metal sheets at both ends for transport and storage.

(ii) After isolation of power and control circuit connections it shall be possible to safely carryout maintenance in a compartment with the busbar and adjacent circuit live. Necessary shrouding arrangement shall be provided for this purpose. Wherever two breaker compartments are provided in the same vertical section, insulating barriers and shrouds shall be provided in the rear cable compartment to avoid accidental touch with the live parts of one circuit when working on the other circuit.

(iii) All 415 V switchgear (circuit-breaker) panels shall be of single-front type MCCs and ACBs shall be of single-front construction. All single-front switchboards shall be provided with single-leaf, hinged or bolted covers at the rear. The bolts shall be of captive type. The covers shall be provided with "DANGER" labels. All panel doors shall open by 90 degree or more.

(iv) All ACDBs shall be of fixed module type. All 415 V circuit breaker modules and MCC modules shall be of fully draw-out type having distinct 'Service' and 'Test' positions. The equipment pertaining to a draw-out type incomer or feeder module shall be mounted on a fully withdraw-able chassis which can be drawn out without having to unscrew any wire or cable connection. Suitable arrangement with cradle/rollers and guides shall be provided for smooth movement of the chassis. For modules of size more than half the panel height, double guides shall be provided for smooth removal or insertion of module. All identical module chassis of same size shall be fully interchangeable without having to carry out any modifications.

(v) All disconnecting contacts for power and control circuits of draw-out modules shall be of robust and proven design, fully self-aligning and spring-loaded. Both fixed and moving contacts shall be silver-plated and replaceable. The spring loaded power and control draw-out contacts shall be on withdraw-able chassis and same on fixed portion shall not be accepted. Detachable plug and socket type control terminals shall also be acceptable.

(vi) Individual opening in the vertical bus enclosure shall permit the entry of moving contacts from the draw-out module into vertical droppers.

(vii) All equipments and components shall be neatly arranged and shall be easily accessible for operation and maintenance. The internal layout of all modules shall be subject to Owner's approval. The Contractor shall submit dimensional drawings showing complete internal details of busbars and module components, for each

type and rating for approval of Owner/owner.

(viii) However, the Owner/owner reserves the right to alter the cable entries top or bottom, if required, during detailed engineering, without any additional commercial implication.

(ix) Each switchboard shall be provided with undrilled, removable type gland plate which shall cover the entire cable alley. Bidder shall ensure that sufficient cable glanding space is available for all the cables coming in a particular section through gland plate. For all single core cables, gland plate shall be of nonmagnetic material. The gland plate shall preferably be provided in two distinct parts for the ease of terminating additional cables in future. The gland plate shall be provided with gasket to ensure enclosure protection.

(x) The composition and disposition of various modules in a switchboard shall be finalized during detailed engineering. The Bidder shall include in his quoted price the cost of any adopter panel/dummy panel required to meet various

9.18 CLEARANCES: The minimum clearance in air between phases and between phases and earth for the entire run of horizontal and vertical busbars and bus-link connections at circuit-breaker shall be 25 mm. For all other components the clearance between 'two live parts', 'a live part and an earthed part', shall be at least 10 mm throughout. Wherever it is not possible to maintain these clearances, insulation shall be provided by sleeving or barriers. However, for horizontal and vertical busbars the clearances specified above should be maintained even when the busbars are sleeved or insulated. All connections from the busbars up-to switch/fuses shall be fully shrouded/insulated and securely bolted to minimize the risk of phase to phase and phase to earth short circuits.

9.19 POWER BUSBARS AND INSULATORS:-

(i) All 415 V Switchboards, MCCs and ACDBs shall be provided with three phase and neutral busbars.

(ii) All busbars and jumper connections shall be of high conductivity aluminium alloy/copper of adequate size.

(iii) The cross-section of the busbars shall be uniform throughout the length of switchboard and shall be adequately supported and braced to withstand the stresses due to the specified short circuit currents. Neutral busbar short circuit strength shall be same as main busbars.

(iv) All busbars shall be adequately supported by non-hygroscopic, non-combustible, track-resistant and high strength sheet moulded compound or equivalent type polyester fibre glass moulded insulators. Separate supports shall be provided, for each phase and neutral busbar. If a common support is provided, anti-tracking barriers shall be provided between the supports. Insulator and barriers of inflammable material such as Hylam, shall not be accepted. The busbar insulators shall be supported on the main structure.

(v) All busbar joints shall be provided with high tensile steel bolts, belleville/spring

washers and nuts, so as to ensure good contacts at the joints. Non-silver plated busbar joints shall be thoroughly cleaned at the jointed locations and suitable contact grease shall be applied just before making a joint. The overlap of the busbars at each joint surface shall be such that the length of overlap shall be equal to or greater than the width of the busbar. All copper to aluminium joints shall be provided with suitable bi-metallic washers.

(vi) All busbars shall be color coded as per IS : 375.

(vii) Wherever the busbars are painted with black matt paint, the same should be suitable for temperature encountered in the switchboard under normal operating conditions.

(viii) The Bidder shall furnish calculations establishing the adequacy of busbar sizes for specified current ratings.

(ix) The neutral bus in MCC shall be connected to earth bus at two points by separate vertical droppers which shall be insulated from MCC enclosure. The neutral bus shall not be earthed in all the other boards in which incomers are not from transformers.

9.20 AUXILIARY BUSBARS AND CONTROL TRANSFORMERS:-

9.20.1 AC CONTROL SUPPLY BUS BAR: Each bus-section of all Switchgears and MCCs shall be provided with one (1) no. 415 V/110V control transformer as shown in enclosed Drawing. The 110 V AC control supply from the control transformers shall be run through the MCC by means of two sets of control supply busbars of electrolytic copper. In case of failure of one transformer, whole bus section can be fed through single transformer. The control supply to different modules shall be tapped individually from the control supply busbars. One pole of secondary winding of control transformers shall be solidly grounded through a test link. The transformer body shall be earthed at two points.

9.20.2 DC CONTROL SUPPLY BUS BARS: For PLC based control system, DC supply to PLC unit including relays shall be provided with one (1) no. of 415 V/220V control transformer with inverter unit in each section of the MCC. The Bidder shall provide suitable terminals, switch etc. to receive the DC supply and distribute the same through above mentioned control busbars to the required modules of the respective section. The DC control supply bus of one section shall be coupled to the control supply of other section through a switch located in the bus-coupler breaker panel. The DC supply to the bus-coupler breaker may be given from any of the control buses.

9.20.3 SPACE HEATER BUSBARS: Panel and motor space heaters shall be fed from separate AC auxiliary busbars running throughout the switchboard. The supply for these busbars shall be tapped from incomers before the isolating switch/circuit breaker. Incoming circuit to space-heater bus shall have an isolating switch, HRC fuse and neutral link of suitable rating. Suitable terminals shall also be provided to facilitate energisation of space-heater bus from outside during long shutdowns of unit/switchboard.

9.20.4 CONTROL TRANSFORMERS: The control transformers shall be 415 V/110 V, dry type, of insulation class B or better. The sizing of Control transformers shall be carried out by Bidder considering the actual load of power contactors, auxiliary contactors, indicating lamps and other equipments in the module circuit. An additional load of 15 watts should also be considered for each module, for remote auxiliary relays and lamps to be connected in the control circuit of modules. Bidder shall also ensure that control transformers are adequately designed for meeting the momentary loading requirements and the voltage drop during this condition shall not be more than 5%.

9.20.5 EARTH BUS AND EARTHING:-

(i) A galvanized steel earth bus shall be provided at the bottom of each panel and shall extend throughout the length of each switchboard. It shall be welded/bolted to the framework of each panel and breaker earthing contact bar. Vertical earth bus shall be provided in each vertical section which shall in turn be bolted/welded to main horizontal earth bus.

(ii) The earth bus shall have sufficient cross section to carry the momentary short circuit and short time fault current to earth, without exceeding the allowable temperature rise.

(iii) Suitable arrangements shall be provided at each end of the horizontal earth bus for bolting to earthing conductors. The horizontal earth bus shall project out of the switchboard ends and shall have predrilled holes for this connection. All joint splices to earth bus shall be made through at-least two bolts and taps by proper lug and bolts connection.

(iv) All non-current carrying metal work of the switchboard shall be effectively bonded to the earth bus. Electrical conductivity of the whole switchgear enclosure framework and truck shall be maintained even after painting.

(v) The carriage and breaker frame shall get earthed while being inserted in thepanel and positive earthing of the breaker frame shall be maintained in all positions, i.e. SERVICE & ISOLATED, as well as the throughout the intermediate travel.

(vi) Each module frame shall get engaged to the vertical earth bus before the disconnecting contacts on the module are engaged to the vertical busbars.

(vii) All metallic cases of relays, instruments and other panel-mounted equipments shall be connected to earth by independent stranded copper wire of size not less than 2.5 sq. mm. All the equipment mounted on the door shall be earthed through flexible wire/braids. Insulation color code of earthing wires shall be green. Earthing wires shall be connected to terminals with suitable clamp connectors, soldering is not acceptable. Looping of earth connections which would result in loss of earth connections to other devices, when a device is removed, is not acceptable. However, looping of earth connections between equipments to provide alternative paths to earth bus is acceptable.

(viii) VT and CT secondary neutral point earthing shall be at one place only, i.e., on

the terminal block. Such earthing shall be made through links so that earthing of one secondary circuit shall be removed without disturbing the earthing of other circuit.

(ix) All hinged doors having potential carrying equipment mounted on it shall be earthed by flexible wire/braid. For doors not having potential carrying equipment mounted on it, earth continuity through scraping hinges/hinge pins of proven design may also be acceptable. The Bidder shall establish earth continuity at site also.

9.20.6 CIRCUIT BREAKERS:-

(i) Circuit breakers shall be three pole, air break, horizontal draw-out type, and shall have fault making and breaking capacities. The operating duty shall be O-3 min-CO-3 min-CO.

(ii) Circuit breakers along-with its operating mechanism shall be provided with suitable arrangement for easy withdrawal.

(iii) There shall be "SERVICE", "TEST" and "ISOLATED" positions for the breakers. Locking facilities shall be provided so as to prevent movement of the circuit breaker from the "SERVICE", "TEST" or "ISOLATED" position. It shall be possible to close the door in "TEST" position.

(iv) All circuit breakers shall have short circuit releases and shunt trip coil irrespective of the type of operating mechanism.

(v) All circuit breakers shall be provided with "4 NO" and "4 NC" potential free auxiliary contacts. These contacts shall be in addition to those required for internal mechanism of the breaker and should be directly operated from breaker operating mechanism.

(vi) Suitable mechanical indications shall be provided on all circuit breakers to show "OPEN", "CLOSE", "SERVICE", "TEST" and "SPRING CHARGED" positions.

(vii) All circuit breakers shall be provided with the following interlocks :

(a) Movement of a circuit breaker between "SERVICE" and "TEST" position shall not be possible unless it is in open position.

(b) Closing of a circuit breaker shall not be possible unless it is in "SERVICE" position, "TEST" position or in "ISOLATED" position.

(c) Circuit-breaker cubicles shall be provided with safety shutters operated automatically by the movement of the circuit breaker carriage to cover the stationary isolated contacts when the breaker is withdrawn.

(d) A breaker of particular rating shall be prevented from insertion in a cubicle of a different rating.

(e) Circuit breakers shall be provided with coded key/electrical interlocking devices.

(viii) Circuit breaker shall be provided with electrical anti-pumping and trip free feature even if mechanical anti-pumping feature is provided.

(ix) Mechanical tripping shall be possible by means of front mounted Red trip push button. In case of electrically operated breakers these push buttons shall be shrouded to prevent accidental operation.

(x) Means shall be provided to slowly close the circuit breaker in "ISOLATED", if

required, for inspection and setting of contacts.

(xi) Complete shrouding/segregation shall be provided between incoming and outgoing bus links of breakers. In case of bus coupler breaker panels the busbar connection to and from the breaker terminals shall be segregated such that each connection can be approached and maintained independently with the other bus section live. Dummy panels if required to achieve the above feature shall be included in the Bidder's scope of supply.

(xii) Circuit breaker shall be provided with following mechanism:

9.20.7 POWER OPERATED MECHANISM:-

(i) Power operated mechanism shall be provided with a universal motor suitable for operation on 110V AC Control supply, with voltage variation from 85% to 110% rated voltage. Motor insulation shall be class "E" or better.

(ii) The motor shall be such that it requires not more than 30 seconds for fully charging the closing spring at minimum available control voltage.

(iii) Once the closing springs are discharged, after one closing operation of circuit breaker, it shall automatically initiate recharging of the spring.

(iv) The mechanism shall be such that as long as power is available to the motor, a continuous sequence of closing and opening operations shall be possible. After failure of power supply at least one open-close-open operation shall be possible.

(v) Provision shall be made for emergency manual charging and as soon as this manual charging handle is coupled, the motor shall automatically get mechanically decoupled.

(vi) All circuit breakers shall be provided with closing and trip coils. The closing coil shall operate correctly at all values of voltage between 85% to 110% of rated control voltage. The trip coil shall operate satisfactorily at all values of voltage between 70% to 110% of rated control voltage.

(vii) Provision for mechanical closing of the breaker only in "TEST" and "ISOLATED" positions shall be made.

(viii) Power operated mechanism shall be provided with a universal motor suitable for operation on 110V AC Control supply, with voltage variation from 85% to 110% rated voltage. Motor insulation shall be class "E" or better.

(ix) The motor shall be such that it requires not more than 30 seconds for fully charging the closing spring at minimum available control voltage.

(x) Once the closing springs are discharged, after one closing operation of circuit breaker, it shall automatically initiate recharging of the spring.

(xi) The mechanism shall be such that as long as power is available to the motor, a continuous sequence of closing and opening operations shall be possible. After failure of power supply at least one open-close-open operation shall be possible.

(xii) Provision shall be made for emergency manual charging and as soon as this manual charging handle is coupled, the motor shall automatically get mechanically decoupled.

(xiii) All circuit breakers shall be provided with closing and trip coils. The closing

coil shall operate correctly at all values of voltage between 85% to 110% of rated control voltage. The trip coil shall operate satisfactorily at all values of voltage between 70% to 110% of rated control voltage.

(xiv) Provision for mechanical closing of the breaker only in "TEST" and "ISOLATED" positions shall be made.

9.20.8 TELESCOPIC TROLLY: One (1) Telescopic trolley shall be provided for maintenance of circuit-breaker module in a cubicle. The trolley shall be such that the topmost breaker module can be withdrawn on the trolley and can be lowered for maintenance purpose. The telescopic trolley shall be such that all type, size and rating of breaker can be withdrawn/inserted of particular switchgear.

9.20.9 AIR BREAK SWITCHES:-

(i) Air break switches shall be of heavy duty, single throw, group operated, load break, fault make type when associated with fuses and complying with IS:4064. All switches for motor circuits shall be of utilization category AC-23 with 1NO+1NC auxiliary contact which shall be wired to the control circuit as shown in the schematic drawings. All switches for other outgoing feeders shall be of utilization category AC-22.

(ii) Continuous current rating of the switches shall be selected for various feeders.

(iii) The main switches shall be operable from outside the module door. The switch handle shall clearly indicate the position of switch. Switch operating handles shall be provided with padlocking facilities to lock them in "OFF" position. However, incomer switches of switchboards shall be provided with padlocking facility in both "ON" and "OFF" positions.

(iv) Interlocks shall be provided such that the cubicle door will not open when the switch is in closed position and the switch will close only when the door is closed.

(v) Switches and fuses for AC control supply and heater supply wherever required, shall be mounted inside the cubicles.

(vi) Even for a single feeder the Bidder shall provide TPN switch, fuse-bases and cable/link connections between switch/fuse and vertical bus bars for all the three phases, so that changing from single phase feeder to three phase feeder is possible without any modification other than inserting fuses at site.

(vii) Terminal blocks for CT & VT secondary leads shall be provided with test links and isolating facilities. CT secondary leads shall be provided with short circuit and earthing facilities.

(viii) In all circuit breaker panels at least 10% spare terminals for external connections shall be provided and these spare terminals shall be uniformly distributed on all terminal blocks.

(ix) All terminal blocks shall be suitable for terminating on each side two (2) nos. stranded copper conductors of size up-to 2.5 mm2 each.

(x) All terminals shall be numbered for identification and grouped according to the function. Engraved white-in-black labels shall be provided on the terminal blocks.

(xi) Terminal blocks shall be arranged with at-least 100 mm clearance between two sets of terminal blocks. The minimum clearance between the first row of terminal blocks and the associated cable gland plate shall be 250 mm.

9.20.10 CONTROL TERMINAL BLOCKS:-

(i) Cable termination compartment and arrangement for power cables shall be suitable for heavy duty, 1.1 KV grade, stranded aluminium conductor, PVC/XLPE insulated, armoured and PVC sheathed cables. All necessary cable terminating accessories such as supporting clamps and brackets, power cable lugs, hardware etc. shall be provided by the Bidder to suit the cable sizes.

(ii) All power cable terminals shall be of stud type and the power cable lugs shall be of tinned copper solder less crimping ring type conforming to IS: 8309. All lugs shall be insulated/sleeved.

9.20.11 NAME PLATES AND LABELS:-

(i) The MCC shall be provided with prominent, engraved identification plates. The module identification plate shall clearly indicate the feeder number and feeder designation as indicated elsewhere.

(ii) The name plates shall be of non rusting metal with white non graved letterings on black back grounds. Inscriptions and lettering sizes shall be subject to owner's approval.

(iii) Suitable stenciled paint mark shall be provided in side the panel /module for identification of all equipments in addition to the plastic sticker labels, if provided. The labels shall be positioned so as to be clearly visible. The labels shall bear the device number as indicated in the approved module wiring drawing.

(iv) Caution plate with the inscription "WARNING LIVE TERMINALS" shall be provided at all joints where the terminals are likely to remain live and isolation is possible only at remote end.

9.20.12 PAINTING: The sheet steel work shall be pre treated, in tanks, in accordance with relevant code. Finishing paint on panels shall be shade 692 (smoke grey) in accordance with relevant code. The inner surface of the panels shall be glossy white. All hardware shall be nickel chromium plated or zinc passivated.

9.20.13 GASKETS: The gaskets wherever specified shall be of good quality synthetic rubber with good ageing, compression and oil resistant characteristic suitable for panel application.

9.20.14 PERFORMANCE:-

9.20.14.1 TEMPERATURE-RISE: The temperature rise of the horizontal and vertical busbars and main bus links including all power draw out contacts when carrying 90% of the rated current along the full run shall in no case exceed 550°C with silver plated joints and 400°C with all other types of joints over the specified ambient temperature.

9.20.15 DERATING OF EQUIPMENTS:-

(i) The Bidder shall ensure that the equipment offered carry the required load current at specified ambient temperature and perform the operating duties without exceeding the permissible temperature as per relevant code. Continuous current rating at specified ambient temperature shall in no case be less than 90% of the normal rating specified.

(ii) The Bidder shall indicate clearly the derating factors, if employed for any component and furnish the basis for arriving at these derating factors duly considering the specified current ratings and ambient temperature specified

9.20.16 PROTECTION CO-ORDINATION: It shall be the responsibility of the Bidder to fully co-ordinate the overload and short circuit tripping of the circuit breakers with the upstream and downstream circuit breakers/fuses/motor starters, to provide satisfactory discrimination. Further the various equipment supplied shall meet the requirements of Type C class of Co-ordination as per IEC 292.

9.20.17 CONTROL AND SELECTOR SWITCHES:-

(i) Control and Selector switches shall be of rotary type, with escutcheon plates clearly marked to show the function and positions. The switches shall be suitable for mounting on panel front.

(ii) Circuit breaker control switches shall have three positions and shall be spring return to "NEUTRAL" from "CLOSE" and "TRIP" positions and shall have pistol grip handles. The control switch shall have at least two (2) contacts closing in 'Close' position, and two (2) contacts closing in 'Trip' position.

(iii) Circuit breaker selector switches for motor feeders shall have three stay put positions marked "Switchgear", "Normal" and "Trial" respectively. They shall have at least three contacts for each of the three positions and shall have black spade handles. Circuit breaker selector switches for other feeders shall have two stay put positions marked "Switchgear" and "Normal" with two contacts for each of the two positions

(iv) Ammeter and voltmeter selector switches shall have four stay put positions with adequate number of contacts for 3-phase 4-wire system. Ammeter selector switches shall have make before break type contacts to prevent open circuit of CT secondary.

(v) Contacts of the switches shall be spring assisted.

(vi) The contact ratings shall be at least the following :
   (a) Make and carry, continuously10 A, 110 V AC.
   (b) Breaking current at 110 V AC and 0.3 lagging P.F., 5A.

9.20.18 CONTACTORS:-

(i) Motor starter contactors shall be of air break, electro-magnetic type rated for uninterrupted duty as per IS :2959.

(ii) Contactors shall be double-break, non-gravity type and their main contacts shall be silver faced.

(iii) Direct-on-line contactors shall be of utilization category AC3. Reversing starters shall comprise of Forward and Reverse contactors mechanically and electrically interlocked with each other. These contactors shall be of utilization category AC4.

(iv)The number of normally open (NO) and normally closed (NC) auxiliary contacts of a contactor shall be as per requirement shown in the respective module drawings. It shall, however, be not less than 2 NO+2NC.

(v) Operating coil of contactors shall be of 110 V AC unless otherwise specified elsewhere. The contactor shall operate satisfactorily between 85% to 110 % of the rated voltage. The contactor shall not drop out at 70% of the rated voltage but shall definitely drop out at 20% of the rated voltage.

9.20.19 FUSES:-

(i) All fuses shall be of HRC cartridge fuse link type. Fuses for AC circuits shall be rated for 80 KA rms (prospective) breaking capacity at 415 V AC.

(ii) Fuse shall have visible operation indicators. Insulating barriers shall be provided between individual power fuses.

(iii) Fuse shall be mounted on insulated fuse carrier which is mounted on fuse bases. Wherever it is not possible to mount fuses on carriers, fuses shall be directly mounted on plug - in type of bases. In such cases one set of insulated fuse pulling handles shall be supplied with each switchboard.

(iv) Fuse ratings shall be selected by the Bidder for various feeders.

(v) The Neutral links shall be mounted on fuse carriers which shall be mounted on fuse bases.

9.20.20 INSTRUMENT TRANSFORMERS:-

(i) All current and voltage transformers shall be completely encapsulated cast resin insulated type suitable for continuous operation at the temperature prevailing inside the switchgear enclosure, when the switchboard is operating at its rated condition and the specified ambient temperature. The class of insulation shall be 'E' or better.

(ii) All instrument transformers shall be able to withstand the thermal and mechanical stresses resulting from the maximum r.m.s short circuit breaking and peak making

current ratings of the associated switchgear.

(iii) All instrument transformers shall have clear indelible polarity markings. All secondary terminals shall be wired to separate terminals on an accessible terminal block where star point formation and earthing shall be done.

(iv) Current transformers may be multi or single core type. All voltage transformers shall be single phase type.

(v) The bus VTs shall be housed in separate compartment. All VTs shall have readily accessible HRC current limiting fuses on both primary and secondary sides.

(vi) All CTs shall be provided with supports independent of busbar/ busbar supports.

(vii) The metering CTs shall be of Class 1 accuracy and adequate VA burden. The Protection CTs shall be of 5P10 accuracy class with adequate burden.

9.20.21 RELAYS & TIMERS:-

(i) All relays and timers in protective circuits shall be flush mounted on panel front with connections from the inside. They shall have transparent, dust tight covers removable from the front. All protective relays shall have a draw-out construction for easy replacement from the front. They shall either have built in test facilities or shall be provided with necessary test blocks and test switches located immediately below each relay.

(ii) All AC relays shall be suitable for operation at 50 Hz with 110 Volt VT secondary and 1A or 5A CT secondary.

(iii) Protective relays, auxiliary relays and timers shall be provided with hand reset operation indicators.

(iv) All relays shall withstand a test voltage of 2.5 KV AC rms for one second or 2 KVA rms for one minute. The accuracy class shall be 5 of IS : 3231.

(v) All fuse protected contactor controlled motor and actuator starters shall be provided with three element, ambient temperature compensated, time lagged, hand reset type thermal overload relays with single phasing protection using differential movement and bimetallic strips. The single phasing protection shall operate even with 100% of the set current flowing in two of the phases and no current in the third phase. The setting ranges shall be adjustable type. These relays shall have a separate hand reset push button mounted on compartment door and shall have at-least one changeover contact. Heavy duty starting overload relays shall be provided for modules controlling motors with long starting time. The requirement shall be finalized during detailed engineering. All releases in circuit breakers shall conform to IS:13947. The releases shall be instantaneous or time delayed as per the requirement mentioned in module description. The releases shall have an operation indicator. The instantaneous release used for motor feeders shall be co-coordinated such that it does not operate with motor starting current.

(vi) The DC auxiliary relays for PLC system shall be designed for 220 V DC unless otherwise specified and shall operate satisfactorily between 75% and 110 % of the rated voltage. Relays shall have adequate thermal capacity for continuous operation. For PLC-controlled modules the coupling relays shall be provided by Bidder. The other parameters of these relays shall be same as (iv) above except for peak inverse voltage of diode which will be twice the rated voltage of coil.

9.20.22 INDICATING INSTRUMENTS:-

(i) All indicating and integrating meters shall be flush mounted on panel front. The instruments shall be of at least 96 mm. square size with 90 degree linear scales, and shall have an accuracy class of 2.0 or better. The covers and cases of instruments and meters shall provide a dust and vermin proof construction.

(ii) All instruments shall be compensated for temperature errors and factory calibrated to directly read the primary quantities. Means shall be provided for zero adjustment without removing or dismantling the instruments.

(iii) All instruments shall have white dials with black numerals & lettering. Black knife edge pointer shall be provided for meters.

(iv) Ammeters provided for motor feeders shall have a compressed scale at the upper current region to cover the starting current upto 6.0 times the CT primary current.

9.20.23 INDICATING INSTRUMENTS:-

(i) Push buttons shall be of spring return, push-to-actuate type. Their contacts shall be rated to make, continuously carry and break 10 A at 110 V AC.

(ii) All push buttons shall have one normally open and one normally closed contact unless specified otherwise. The contact faces shall be of silver alloy.

(iii) All push buttons shall be provided with integral escutcheon plates marked with its function. The colour of the button shall be as follows : Green for motor START, breaker CLOSE, commands Red for motor TRIP, breaker OPEN, commands Black for all annunciation functions, overload, reset and miscellaneous commands including reversal.

(iv) All emergency push buttons shall have mushroom knobs.

9.20.24 INDICATING LAMPS:-

(i) 16.1 Indicating lamps shall be of the panel mounting, LED/filament type and low watt consumption. The lamps shall have escutcheon plates marked with its function wherever necessary.

(ii) Lamps shall have translucent lamp-covers of the following colors, as warranted by the application.

Red for motor ON, valve/damper OPEN, breaker CLOSE
Green for motor OFF, valve/damper CLOSE, breaker OPEN
White for motor AUTO TRIP
Blue for all healthy conditions (e.g. CONTROL SUPPLY ON, and also for "SPRING CHARGED")
Amber for all Alarm Conditions (e.g. overload). Also for "SERVICE" and "TEST" position indications.

(iii) Bulbs and lamp covers shall be easily replaceable from the front of the cubicle.

(iv) All indicating lamps shall be suitable for continuous operation at 90% to 110% of their rated voltage

9.20.25 SPACE HEATER:-

(i) Space heaters shall be provided in the switchboards wherever the manufacturer considers them necessary and recommends their provision for preventing harmful moisture condensation.

(ii) The space heaters shall be suitable for continuous operation on 240 V AC, 50 Hz, single phase supply and shall be automatically controlled by thermostats. Necessary switches and fuses shall also be provided.

(iii) The circuit for each panel and motor space heater should have an isolating switch, HRC fuse and isolating link. In addition, the space heater circuit of each panel shall also have a thermostat of suitable rating.

9.20.26 INTERNAL WIRING:-

(i) All switchboards shall be supplied completely wired internally up-to the terminals ready to receive external cables.

(ii) All inter-cubicle and inter-panel wiring and connections between panels of same switchboard including all bus wiring for AC supplies shall be provided by the Bidder.

(iii) All auxiliary wiring shall be carried out with 650 V grade, single core, stranded copper conductor, color coded, PVC insulated wires. Conductor size shall be 1.5 mm2 (min.) for control circuit wiring and 2.5 mm2 (min.) for CT and space heater circuits.

(iv) Engraved core identification ferrules marked to correspond with panel wiring diagram shall be fitted at both ends of each wire. The ferrule shall be of self locking type. The wire identification marking shall be in accordance with IS: 375.

(v) Wiring for equipment, which are to be supplied by the Owner/Other Contractor and for which the Contractor has to provide mounting arrangement in his panels, shall also be provided by the Contractor upto the terminal blocks.

(vi) All connections from vertical busbars for individual modules above 100 A shall be by Copper links only. The cable connections for modules less than 100 A shall be selected in such a way that there will not be any melting/shorting in case of a short circuit inside the

module. For all modules where use of cable is envisaged by the Contractor specific approval from the Owner/owner regarding cable details are to be taken. For power wiring color coded wire insulation/tapes shall be provided.

9.20.27 CONTROL TERMINAL BLOCKS:-

(i) Control terminal blocks shall be of 650 Volts grade, rated for 10 Amps and in one piece moulding. It shall be complete with insulating barriers, clip-on type terminals and identification strips. Marking on terminal strip shall correspond to the terminal numbering on wiring diagrams. It shall have insulating material conforming to relevant code.

(ii) Terminal blocks for CT & VT secondary leads shall be provided with test links and isolating facilities. CT secondary leads shall be provided with short circuit and earthing facilities.

(iii) In all circuit breaker panels at least 10% spare terminals for external connections shall be provided and these spare terminals shall be uniformly distributed on all terminal blocks.

(iv) All terminal blocks shall be suitable for terminating on each side two (2) nos. stranded copper conductors of size up-to 2.5 mm^2 each.

(v) All terminals shall be numbered for identification and grouped according to the function. Engraved white-in-black labels shall be provided on the terminal blocks.

(vi) Terminal blocks shall be arranged with at-least 100 mm clearance between two sets of terminal blocks. The minimum clearance between the first row of terminal blocks and the associated cable gland plate shall be 250 mm.

9.20.28 CONTROL TERMINAL BLOCKS:-

(i) Cable termination compartment and arrangement for power cables shall be suitable for heavy duty, 1.1 KV grade, stranded aluminium conductor, PVC/XLPE insulated, armoured and PVC sheathed cables. All necessary cable terminating accessories such as supporting clamps and brackets, power cable lugs, hardware etc. shall be provided by the Bidder to suit the cable sizes.

(ii) All power cable terminals shall be of stud type and the power cable lugs shall be of tinned copper solder less crimping ring type conforming to IS: 8309. All lugs shall be insulated/sleeved.

9.20.29 NAME PLATES AND LABELS:-

(i) The MCC shall be provided with prominent, engraved identification plates. The module identification plate shall clearly indicate the feeder number and feeder designation as indicated elsewhere.

(ii) The name plates shall be of non rusting metal with white non graved letterings on black

back grounds. Inscriptions and lettering sizes shall be subject to owner's approval.

(iii) Suitable stencilled paint mark shall be provided in side the panel /module for identification of all equipments in addition to the plastic sticker labels, if provided. The labels shall be positioned so as to be clearly visible. The labels shall bear the device number as indicated in the approved module wiring drawing.

(iv) Caution plate with the inscription "WARNING LIVE TERMINALS" shall be provided at all joints where the terminals are likely to remain live and isolation is possible only at remote end.

9.20.30 PAINTING: The sheet steel work shall be pre treated, in tanks, in accordance with relevant code. Finishing paint on panels shall be shade 692 (smoke grey) in accordance with relevant code. The inner surface of the panels shall be glossy white. All hardware shall be nickel chromium plated or zinc passivated.

9.20.31 GASKETS: The gaskets wherever specified shall be of good quality synthetic rubber with good ageing, compression and oil resistant characteristic suitable for panel application.

CRITERIA OF MAKE/MODEL OF EQUIPMENTS TO BE USED

For execution of the subject tendered job , the bidder have to use equipments and accessories as per **approved vendor list of CMPDIL** (enclosed in annexure-A) or equipments as per **approved proven-ness criteria of CCL** which reads as follows shall be applicable (For using approved proven-ness criteria of CCL attracts competent approval from the Employer)

PROVEN-NESS CRITERIA: Eligibility criteria for proven sources: "Tenderer must have supplied the tendered item/ tendered item of higher capacity /size/version in the past to CIL and / or to its Subsidiaries Hqrs and / or to the Mining Industries and / or to the Other Industries (Private or Government / Public Sector Undertaking (PSU), (Indigenous or Global) and performed satisfactorily for a period not less than one year from the date of commissioning." The tenderer will have to submit satisfactory performance report for tendered item/ tendered item of higher capacity /size/version of equipment offered issued by authorized representative. However CCL reserves the right to verify the above or get the performance directly from the concerned buyers/customers/end users of the equipment (against past supplies) of the tenderer. N.B:-In case type and model of equipment offered has been supplied in past to CCL, Performance Certificate shall be issued /given by HOD of the Technical Department at the time of Evaluation. Status of Proven-ness would be evaluated and decided by HODs of Technical Department.

Registered Vendors List (24.03.2014)

Coal & Mineral Preparation Division

The makes of various equipment are listed out hereunder. It is essential that bidder/ contractor shall source its equipment from any of the makes listed against that particular equipment in the list. In case the bidder/ contractor intends to add any particular make of equipment by a make other than that listed hereunder, the same shall be done during the execution of the work after getting competent approval from the employer.

Note: Manufacturer Name either appearing in list published by E&M or CMP Division under the Registered Vendors List shall be construed as registered with CMPDI

A. MECHANICAL EQUIPMENT

SL. NO.	ITEM DESCRIPTION		NAME OF APPROVED MANUFACTURERS
1.	CONVEYOR IDLERS	:	ELECON / TRF/ KALI / MBE / THYSSEN-KRUPP / HINDUSTAN UDYOG LTD./ BENGAL TOOLS LTD./ NEWALL INDUSTRIES/ VISHWA./Promac Engg. Ind./ Golden Engineering Industries/ Amps Engineering & equipment Pvt. Ltd/ Bevcon Wayors Pvt. Ltd./ Tecpro Systems Ltd.
2.	CONVEYOR PULLEYS	:	ELECON / TRF / KALI/ MBE / THYSSEN-KRUPP / HINDUSTAN UDYOG LTD./ BENGAL TOOLS LTD. /NEWALL INDUSTRIES/ VISHWA/ Promac Engg. Ind./ Golden Engineering Industries/ Bevcon Wayors Pvt. Ltd/ Tecpro systems Ltd.
3.	ACTUATORS	:	TECHNO-MECH. ENGINEER/ ACTUATORS INDIA / INDIAN ENGG. WORKS
4.	GEAR BOX	:	ELECON / PREMIUM / FLENDER/ GEARS INDIA / ALLEN BERRY / MACNEILL GEARS / DAVID BROWN / ALLEN RANK / RADICON / BENGAL TOOLS/ VULCAN GEARS/ BALDOR ELECTRIC.
5.	COUPLING (FLEXIBLE/GEARED)	:	ELECON / NAW / FENNER / HI-CLIEF/ WELLMAN-BIBBY / ESBI HI- FLEX PVT. LTD.
6.	FLUID COUPLING	:	VOITH / PEMBRIL / FLUID DRIVE / FLUIDOMAT/ ELECON
7.	BELT CONVEYOR	:	ELECON / MBE / TRF / L&T / APHMEL / THYSSEN-KRUPP /HINDUSTAN UDYOG LTD/ BENGAL TOOLS LTD./ SANDVIK ASIA LTD.
8.1	BELTING (NN, EP)	:	MRF / SEMPERTRANS NIRLON / PHOENIX / NORTHLAND RUBBER MILLS / ORIENT RUBBER / FORECH / HINDUSTAN RUBBER/ NEELKANTH RUBBER MILLS/ JOHNSON RUBBER INDUSTRIES/ NRC INDUSTRIES/ SOMI CONVEYOR BELTINGS LTD.
8.2	STEEL CORD BELTING	:	PHOENIX / BANDO, JAPAN / CLOUTH, GERMANY / IMAS, GERMANY / DUNLOP/ MARUBENI, JAPAN / SIG, ITALY/ FORECH.

SL. NO.	ITEM DESCRIPTION		NAME OF APPROVED MANUFACTURERS
9.	APRON FEEDER	:	SAYAJEE / L&T / HEC / MBE / ELECON/TRF/ THYSSUN-KRUPP
10.	ROTARY PLOUGH FEEDER	:	LOUISE INDIA / TRF / THYSSEN-KRUPP / ELECON / L & T/ MBE.
11.	GYRATORY CRUSHER	:	FFE (INDIA) LTD. / HEC / THYSSEN-KRUPP/ METSO, USA / ROXON, FINLAND / KOBE STEEL, JAPAN / UNITED HEAVY MACHINERY (URALMASH IZHORE GROUP), RUSSIA/ SANDVIK ASIA LTD.
12	SIZERS		MMD/ FFE/ STAMLER OLDENBURG(UK)/ THYSSUN-KRUPP/ DBT MINERAL PROCESSING Gmbh, GERMANY
13.	RAPID LOADING OUTFITS		STRATEGIC WEIGHING SYSTEMS/ MERIT TECHNOLOGIES/ RAMSEY/ Schenck Process India Ltd./ Essae Digitronics(Kanawha RLS)
14.	HYDRAULIC ROCK BREAKER	:	TELEDYN / L&T / INGRESOL-RAND / VIPER INTERNATIONAL, U.K. /THYSSEN-KRUPP / SANDVIK ASIA LTD/ Jaypee Engg & Hydraulic Equipment Co. Ltd.
15.	BELT WEIGHER	:	JHONSON & NICHOLSON / POWER BUILD/ AUTO MEASUREMATIC / GILLANDERS / KIS TELEMORSE/ Schenck Process India Ltd., M/s Precia Molen India Ltd
16.	CHUTE LINER	:	TEGA / KAVERI /DEVI-RUBBER / WEAR RESISTANT TECHNOLOGIST / DURAWELD WEARPLATES.
17.	CHAIN PULLEY BLOCK	:	INDEF / TRACTEL TIRFOR / GREAVES COTTON / BATLIBOI / TURBO FURGUSON / ELEMECH HOIST / GRIP ENGINEERS / REVA ENGG./ KANUBHAI / / SUREKA/ ARMSEL
18.	MOTORISED FLAP GATE	:	TECHNO-MECH/ ACTUATORS INDIA/ PRECISION/ MERIT TECHNOLOGIES.
19.	PUMPS	:	MATHER & PLATT/ KIRLOSKAR/ GREAVES COTTON / JYOTI / MAMC /HUMBOLDG WEDAG / DORR-OLIVER / HYD. IND. / KSB/ BEACONWEIR/ McNally Sayaji Engineering Limited, Weir Minerals, Metso Minerals
20.	LEVEL INDICATOR	:	UPTRON / ENDRESS & HOUSER/ NIVO CONTROLS / AUTO MEASUREMATIC / MONITOR CONTROLS / EPI INSTRUMENTS / HEIN-LEHMANN/ EIP BULK CONTROLS/ KISTLERMORSE
21.	ELECTRIC HOIST	:	HOIST-O-MECH/ GREAVES COTTON/ ELEMECH HOIST/POWER BUILD/ KANUBHAI/ INDEF/ BATLIBOI/ BRADY/ TRACTEL TRIFOR / HITECH/ TURBO-FURGUSON/ GRIP ENGG./ SWIFT (GREAVES)/ KM ENGG./ SUREKA/ ELITE STEELS/ ELECTROMECH MHS.
22.	E.O.T. CRANES	:	HOIST-O-MECH / ELEMECH HOIST / GARLIC / TURBO FERGUSON / GRSE / JESSOP & CO. / KANUBHAI / WMI CRANES LTD. / HEC / HYD. IND. LTD./ UNIQUE/ ANUPAM INDUSTRIES LTD./ELITE STEELS/ ELECTROMECH MHS.

SL. NO.	ITEM DESCRIPTION		NAME OF APPROVED MANUFACTURERS
23.	VENTILATION SYSTEM	:	FLAKT INDIA/ C.DOCTOR & CO./ MAMC/ VOLTAS / BATLIBOI / ABB INDIA / ANDREW YULE/ DUST VAN/ PROJECTS AND CONTROL/ INDVENT FANS/ ARGOSY INCORPORATED / ALSTOM/ APC/ NELSON
24.	DUST SUPPRESSION	:	BATLIBOI/ F. HARLEY/ GEC/ VENDON INDIA LTD. / THERMAX / ANDREW YULE/APC/ PROJECTS AND CONTROL/ Kavery Ultra Polymers
25.	DUST EXTRACTION	:	FLAKT INDIA / ANDREW YULE / GEC / THERMAX/ DUVANT/ ABB INDIA / DUST VAN/ PROJECTS AND CONTROL/ INDVENT FANS / ARGOSY INCORPORATED / ALSTOM/ APC / NELSON
26.	FREIGHT-CUM-PASSENGER LIFT	:	OTIS /MITSHUBISHI, JAPAN /KONE/ THYSSEN-KRUPP
27.	BELT VULCANISER	:	NILOS / SHAW ALMEX / CHANDA & CO.(ENGG.) PVT LTD.
28.	AIR BLASTER	:	TECHNOFAB/ LINEMANN HALFLO, U.K. / DSI/ TEGA / MM FABRICATOR / Kavery Ultra Polymers
29.	SAMPLING SYSTEM	:	RAMSEY/ ADVANCE SYSTEM / EASTMAN CRUSHER /MERIT TECHNOLOGIES.
30.	METAL DETECTOR	:	POWER BUILD/ ELECTROMAG/ MAGNET INDIA/ M.R.EQUIPMENT/ AUTOMATIC CONTROLS/ ERITZ, UK / ELECTRO ZAVED/ KRUPP, GERMANY/ ELECTRO MAGNETIC INDUSTRIES/ MAGNETIC CORPORATION OF INDIA / MAGNET INDUSTRIES(CAL) PVT. LTD.
31.	OVER HEAD SUSPENDED TRAMP IRON MAGNET	:	PBL/ ELECTROMAG/ STEARNS MAGNETIC/ MAGNET INDIA / ERITZ, UK / ELECTRO ZAVED/ KRUPP, GERMANY/ ELECTRO MAGNETIC INDUSTRIES/ MAGNETIC CORPORATION OF INDIA / MAGNET INDUSTRIES(CAL) PVT. LTD.
32	WEIGH BRIDGE	:	Schenck Process India Ltd./ Rice Lake Weighing System (India) Ltd./ Avery.
33	ROLL CRUSHER		McNally Sayaji Engineering Limited/ L&T/ Humbolts wedag
34	FIRE FIGHTING SYSTEM		MINI-MAX/ THERMAX/ VIJAY/ F.HARLEY/ APC/ TECHNOFAB/ STEELAGE/ TECHNO INDIA/ PROJECTS & CONTROL/ HD Fire Protect Pvt. Ltd.

B. WASHERY EQUIPMENTS			
1	VIBRATING SCREENS		TRF/IC/HYDIND/ELECON/MBE/ ORIENT/ SAYAJI/BUCKAU0-WOLF/ L&T/ MBE Coal & Mineral Technology India Pvt. Ltd / TECPRO SYSTEMS LIMITED/ Ingwenya Mineral Tech./ Any reputed make
2	VIBRO FEEDERS		TRF/ IC/ HYD-IND/ ELECON/ MBE/ SAYAJEE/ BACKAU-WOLF/ L&T/ TECPRO SYSTEMS LIMITED/ Any reputed make
3	MAGNETIC SEPARATOR		PBL/ ELECTROMAG/ STEARNS MAGNETIC/ MAGNET INDIA/ ERITZ, UK/ ELECTRO ZAVED/ KRUPP, GERMANY/ ELECTRO MAGNETIC INDUSTRIES/ MAGNETIC CORPORATION OF INDIA/ MAGNET INDUSTRIES (CAL) PVT. LTD. / Ingwenya Mineral Tech./ Metso Minerals/ Any reputed make
4	PLUG VALVES		AUDCO/ DEZURIC/ Any reputed make
5	THICKENER		Dorr-Oliver/ EIMCO/ McNally Sayaji Engineering Limited/ Any REPURTED MAKE/ Metso Minerals,Any reputed make
6	HIGH FREQUENCY SCREEN		TRF/ DERRIK/ HWIPL/ Metso Minerals/ Any reputed make
7	BELT FILTER PRESS		ANDERITZ/ PARNABY/ DELKOR/ METSO MINERAL/ PHOENIX PROCESS EQUIPMENT COMPANY, USA/ Any reputed make
8	HORIZONTAL TRAVELLING VACUUM BELT FILTER		DELKOR TECHNIC (I) PVT. LTD./ BAKER PROCESS/ Any reputed make
9	SOLID BOWL CENTRIFUGE		BIRD/ SIEBTECHNIK/ Any reputed make
10	COMPRESSOR		INGERSOLL RAND/ KHOSLA/ KIRLOSKER/ KAY INTERNATIONAL /ATLAS KOPCO/ Any reputed make
11	CYCLONES		HWI/KREBS/ MBE Coal & Mineral Technology India Pvt. Ltd / STAMICARBON/Metso Minerals/ Any reputed make
12	SAMPLING SYSTEM		RAMSEY/ ADVANCE SYSTEM/ EASTMAN CRUSHER/ MERIT TECHNOLOGIES/ Any reputed make
13	JIGS		Ingwenya Mineral Tech./ MBE Coal & Mineral Technology India Pvt. Ltd/ Any reputed make
14	FLOTATION CELL		McNally Sayaji Engineering Limited/ Metso Minerals /Any reputed make
15	DI Pipes		Electrosteel Castings Limited/Any reputed make
16	HM Bath		Any reputed make
17	Spiral concentrator		Any reputed make

C. ELECTRICAL EQUIPMENT

Sl. No.	ITEM DESCRIPTION		NAME OF APPROVED MANUFACTURERS
1	MOTOR (L.T.)	:	KIRLOSKAR/ BHEL/ SIEMENS/ MARATHON ELECTRIC MOTORS/ JYOTI/ NGEF/ ABB/ CROMPTON GREAVES/ BHARAT BIJLEE/ INTEGRATED ELECTRIC COMPANY LTD/ LAXMI HYDRAULICS PVT. LTD./ BALDOR ELECTRIC
2	MOTOR (H.T.)	:	KIRLOSKAR/ BHEL/ SIEMENS/ MARATHON ELECTRIC MOTORS/ JYOTI/ NGEF/ ABB/ CROMPTON GREAVES/ BHARAT BIJLEE/ INTEGRATED ELECTRIC COMPANY LTD. / LAXMI HYDRAULICS PVT LTD/ BALDOR ELECTRIC
3	FLP MOTORS	:	KIRLOSKAR/ BHEL/ BHARAT BIJLEE/ CROMPTON GREAVES/ MATHER & GREAVES/ LAXMI HYDRAULICS PVT LTD
4	POWER TRANSFORMER	:	KIRLOSKAR/ BHEL/ BHARAT BIJLEE/ GE INDUSTRIAL/ CROMPTON GREAVES/ ANDREW YULE/ SIEMENS/VOLTAS/ ABB/ NGEF/ Transformers & Electricals/ Tesla Transformers Ltd./Pan-electro Technic/ TRANSGIETZ/Voltech Transformers PVT Ltd
5	LIGHTING TRANSFORMER	:	KIRLOSKAR/ BHEL/ BHARAT BIJLEE/ GE INDUSTRIAL/ CROMPTON GREAVES/ ANDREW YULE/ SIEMENS/VOLTAS/ ABB/ NGEF/ L &T / POWER MASTER ELECTRICAL PVT. LTD/ Transformers & Electricals/ Tesla Transformers Ltd./ ELECTRO TEKNICA
6	CONTROL TRANSFORMER	:	L&T/ SIEMENS/ JYOTI/ GE INDUSTRIAL/ NGEF/ KIRLOSKAR/ BHARAT CUTLER HAMMER
7	VACCUM CURCUIT BREAKER/ 6.6/ 11 kV SWITCHGEAR	:	KIRLOSKAR SYSTEMS/ BHEL/ JYOTI/ MEI/ SIEMENS/ ABB/ GE INDUSTRIAL/ ALIND /NGEF/ ANDREW YULE/ ASEA / SOUTHERN SWITCHGEAR (SSG)/ ELECTRO TEKNICA/ MEDITRON/ SAIT Mine Line/BIECCO LAWRIE/ APE POWER PVT. LTD./ MEGAWIN SWITCHGEAR/ MEDITRON/ Amiya Industries.
8	VACCUM CONTACTOR	:	GE INDUSTRIAL / JYOTI/ UNIVERSAL ELECTRICAL/ BHEL/ ANDREW YULE/ SIEMENS/ CROMPTON GREAVES/ MEGAWIN SWITCHGEAR/ Amiya Industries/ Electroteknica Switchgears .
9	LT SWITCH BOARD PANEL/ MOTOR CONTROL CENTRE/ AIR CIRCUIT BREAKER / MCCB / MCB / RCCB	:	NGEF/ L&T/ ANDREW YULE/ GE INDUSTRIAL / JYOTI/ SIEMENS/ BHARATIA INDUSTRIES LTD./ ABB/ EASUN ENGG/ CROMPTON GREAVES/ KIRLOSKAR/ SYSTEMS / SCHNEIDER/ CONTROL & SWITCHGEAR COMPANY/ MINILEC(INDIA) PVT LTD/ STANDARD/ ELECTRICALS LTD/ JOLLY ENGG./ TRANSGIETZ/ MEGAWIN SWITCHGEAR/ MEDITRON/ Amiya Industries/ ZENITH CONTROLS/ HPL India./PRAYAS AUTOMATION/ AC Power System/ ELECTRO TEKNICA/Voltech Controls and Automation Pvt Ltd.
10	P.F.CORRECTION EQIPMENT	:	ABB/ MADHAV CAPACITOR/ GE INDUSTRIAL / VOLTAS/ YESHA/ KHATAU JUNKER/ BHEL/ UNISTAR/ NGEF/ BHARATIA INDUSTRIES LTD./ EPCOS.
11	POWER CABLES & CONDUCTORS	:	CABLE CORPORATION/ FORT GLOSTER/ UNIVERSAL CABLES/ NICCO/ PREMIER CABLES/ HINDUSTAN CABLES/ INCAB/ ASEAN / HAVELLS/ RADIANT/ LASER CABLES/ SKYTONE/ LUMINO/ SIECHEM / Ravin Cables Ltd./KEI INDUSTRIES

Sl. No.	ITEM DESCRIPTION		NAME OF APPROVED MANUFACTURERS
12	CONTROL CABLES	:	CABLE CORPORATION/ FORT GLOSTER/ NICCO/ ASEAN/ UNISTAR/ HINDUSTAN CABLES/ K.D.K./ RAJNIGANDHA CABLES/ HAVELLS/ RADIANT/ LASER CABLES/ SKYTONE/ SIECHEM/ Ravin Cables Ltd./ KEI INDUSTRIES
13	COMMUNICATION CABLES	:	HINDUSTAN CABLES/ DELTRON/ TOSHNIWAL/ INCAB / VINDHYA TELELINK LTD/ SIECHEM.
14	HT/LT TRAILING CABLES/ELASTOMERIC TRAILING	:	UNISTAR/ INCAB/ SKYTONE
15	COMMUNICATION SYSTEM/ EQUIPMENT	:	ITI/ PHILIPS / MOTWANE/ TATA TELECOM / UPTRON/ GE INDUSTRIAL / ECIL/ CROMPTON GREAVES
16	LIGHT FITTINGS	:	PHILIPS/ CROMPTONS/ GE INDUSTRIAL / BAJAJ/ ECE / GLOLITE /ANCHOR
17	RELAYS / Control and relay panel	:	GEC ALSTOM/ L&T/ UNIVERSAL ELECTRIC/ SIEMENS/ KIRLOSKAR SYSTEMS/ A.V.K.-S.E.G. CONTROLS LTD./ BCH / EASUN REYROLL / ABB /ANDREW YULE/ TELEMECANIQUE/ / BHARATIA INDUSTRIES LTD. / CONTROL & SWITCHGEAR COMPANY LTD/ MINILEC(INDIA) PVT LTD / SAIT Mine Line. / MEGAWIN SWITCHGEAR/ Amiya Industries / Voltech Control and Automation
18	PLC	:	L&T/ SIEMENS/ ALLEN BRADLEY/ KELTRON/ UPTRON/ TTS SYSTEMATIC PVT. LTD./ ABB/ MITSUBISI/ SCHNEIDER/ GE FANUC/ BHARATIA INDUSTRIES LTD/ MINILEC(INDIA) PVT LTD/ HONEYWELL/PRAYAS AUTOMATION
19	CT'S & PT'S	:	ELECTRIC POWER EQPT./ EASTERN SWITCHGEAR/ AUTOMATIC ELECTRIC/ POLYCRETE LTD. / KAPPA/ ABB /CONTROL & SWITCHGEAR COMPANY LTD. ./ MAX ENERGY PVT. LTD./ APE POWER PVT. LTD./ MEGAWIN SWITCHGEAR/ Electroteknica switchgears.
20	L.T. CONTACTOR	:	SIEMENS/ L & T/ BHARATIA INDUSTRIES LTD./ GE INDUSTRIAL / ANDREW YULE/ JYOTI / HAVELL'S/ KIRLOSKAR SYSTEMS / ABB / TELEMECANIQUE
21	PUSH BUTTON; INDICATING LAMP	:	L&T/ SIEMENS/ ESSEN/ BCH/ BHARATIA INDUSTRIES LTD/ RASS CONTROLS/ Hotline Switchgears & Control.
22	CONTROL SWITCHES	:	L&T/ KAYCEE/ JYOTI/ ESSEN/ SIEMENS /HAVELL'S
23	ISOLATING SWITCHES/ SOFT STARTERS	:	SIEMENS/ L&T/ BHARATIA INDUSTRIES LTD./ ANDREW YULE/ GE INDUSTRIAL/ JYOTI/ CROMPTON GREAVES/ HAVELL'S/ TELEMECHANIQUE / ABB/ CONTROL & SWITCHGEAR COMPANY / MINILEC (INDIA) PVT LTD /STANDARD ELECTRICALS LTD./ Danfoss Industries Pvt Ltd./PRAYAS AUTOMATION
24	H.T. LOAD BREAK SWITCH	:	JYOTI/ NGEF/ SIEMENS/ KIRLOSKAR SYSTEMS/ BHEL/ ABB/ EASUN/ MEI / CONTROL & SWITCHGEAR COMPANY/STANDARD ELECTRICALS LTD.
25	CONTROL CONSOLE WITH COMPONENT	:	L&T/ SIEMENS/ JYOTI/ NGEF/ GE INDUSTRIAL/ KIRLOSKAR SYSTEM/ ANDREW YULE/ APLAB/ ABB/ ALLEN BRADELY/ BHARTIA INDUSTRIES LTD/ MINILEC (INDIA) PVT LTD/ SKYTONE/ ZENITH CONTROLS
26	BATTERY & BATTERY CHARGER	:	CHLORIDE/ STANDARD/ AMCO
27	(a) LIGHTENING ARRESTER	:	ICE/ OBLUM/ IGE (I) LTD./ WS INSULATORS/CROMPTON GREAVES/

Sl. No.	ITEM DESCRIPTION		NAME OF APPROVED MANUFACTURERS
			SATCOM ELECTRONICS
	(b) EARTHING SYSTEM		SATCOM ELECTRONICS
28	WELDING TRANSFORMER/ MG WELDING SET	:	ADVANI OERLICON/ INDIAN OXYGEN/ PHILIPS/ ESAB
29	ALTERNATOR	:	JYOTI/ BHEL/ KIRLOSKAR ELECTRIC/ CROMPTON GREAVES/ AVK-SEG CONTROLS LTD.
30	DG SET	:	KIRLOSKAR ELECTRIC/ CUMMINS/ LEYLAND / JYOTI/ SRI RAM HONDA/ YAMAHA
31	LIMIT SWITCH, PULL CORD SWITCH, BELT SWAY SWITCH, CENTRIFUGAL SWITCH etc.	:	R.K.ELECTRICALS/ ESSEN/ SIEMENS/ TECHNOCRAT/ PHOTO CONTROL/ JAYSHREE ELECTRONICS/ BHARTIA INDUSTRIES LTD/ SAIT Mine Line/ Protocontrol Instruments./Hotline Switchgears & Control / Hotline Switchgears & Control
32	TIMER	:	BCH/ TELEMECANIQUE/ L&T/ SIEMENS/ GE INDUSTRIAL / ABB/ MINILEC(INDIA) PVT LTD.
33	ELECTRO MAGNETIC BRAKE	:	ELECTROMAG/ PBL/ Industries syndicate / BCH
34	METERS	:	AEP/ IMP/ HPL INDIA/ Hotline Switchgears & Control
35	SELECTOR SWITCH	:	L&T/ SIEMENS/CROMPTON/ BHARTIA INDUSTRIES LTD/ RASS CONTROLS.
36	HRC FUSE	:	GE INDUSTRIAL / L&T/ SIEMENS/ STANDARD/ ABB/ CONTROL & SWITCHGEAR COMPANY LTD/ STANDARD ELECTRICALS LTD./ MEGAWIN SWITCHGEAR.
37	HOOTERS	:	TULLU/ NATIONAL/ Hotline Switchgears & Control
38	AIR CONDITIONER	:	ACCAIRE/ BLUE STAR/ VOLTAS/ GODREJ/ CARRIER
39	TRANSWITCH UNIT	:	TRANSGIETZ
40	UNITIZED SUBSTATION	:	TRANSGIETZ/ MEGAWIN SWITCHGEAR.
41	HV FIELD SWITCH (3.3 & 6.6 kV)	:	TRANSGIETZ / ELECTRO TEKNICA.
42	DCS, SCADA, CCTV and RTU for Sub-station automation and Electrical SCADA	:	HONEYWELL
43	DENSITY MONITOR		Rose Mount/Bells Controls/EC/Any Other Reputed Make
44	ASH ANALYZER		COAL SCAN/EC/ RGI Industries/Any Other Reputed Make
45	SOLENOID VALVE		Rose Mount/Bells Controls/EC/Any Other Reputed Make
46	Level Switches, Chute Block Detector, Level Detector, Level Transmitter	:	Protocontrol Instruments.
47	Proximity Switches (Inductive, Capacitative, Optical, Magnetic, Ultrasonic)	:	Protocontrol Instruments.

ANNEXURE – A1

(A) **Module Type AE (Electrically Controlled Circuit Breaker)**

One (1) Triple-pole circuit breaker, complete with all accessories and power operated mechanism

One (1) Circuit breaker control switch Three (3) Current transformers for metering

Three (3) Current transformers for protection One (1) Ammeter

One (1) Ammeter selector switch

One (1) 'Switchgear'/'Normal' selector switch

Three (3) Indicating lamps with resistors and colored lenses Six (6) HRC Control fuses

One (1) Lock out relay

One (1) Suitable time delayed over current release. Alternatively, over current definite time delay relay with adjustable current setting

150% to 600% of the CT secondary current and adjustable time setting 0.1 Sec to 1 Sec may be offered .The relay shall have a resetting ratio of not less than 90%.

One (1) Neutral link One(1) DC isolating switch.

B) **Module Type AET (Electrically Controlled Circuit Breaker for Incomer from Transformer)**

Similar to module type AE but with following additions :

One (1) Neutral current transformer for earth fault protection

One (1) Single pole instantaneous earth fault relay with adjustable current setting of 50%-200% of rated secondary current of neutral CT. The relay shall have a resetting ratio of not less than 80%.

C) **Module Type CD (Contactor Changeover with Bus Coupler and Two Incoming Supplies)**

(Note : Incomer-A, Incomer-B and Bus Coupler shall be housed in separate drawout modules in different panels. Each of the drawout modules shall be provided with 'Service' position limit switch having 2 NO+2NC contacts).

Incomer-A / Incomer-B

One (1) Triple pole load break isolating switch

One (1) Triple pole contactor with coil suitable for 415 VAC Two (2) Auxiliary contactors with coil suitable for 415 V AC

One (1) Indicating lamp with resistor & colored lens suitable for 415 V AC Three (3) HRC control fuses

Bus Coupler

One (1) Triple pole contactor with coil suitable for 415 V AC Three (3) HRC fuses

Four (4) HRC control fuses

Two (2) Monitoring lamps suitable for 415 V AC.

D) **Module Type CS (AC Control Supply Module)**

(Note : Module Type CS shall be of non-drawout type)

Two (2) 415/110 V control transformers Two (2) 110 V auxiliary relays

Two (2) Earth links

Eight (Eight (8) HRC Control fuses
Two (2) Selector switches.

E) **Module Type E/E1/E2 (Switch Fuse Module)**

One (1) Triple pole switch-fuse unit with three pole isolating switch and three/one/two HRC fuses for E/E1/E2 modules, respectively

One (1) Neutral link.

F) **Module Type G1 (PT Module with Under Voltage Relay)**

Two (2) 440/110 V single phase potential transformers, vee/vee connected, mounted on a common draw-out chassis

Four (4) HRC fuses for PT primary

One (1) Voltmeter (0-500 V for use with 440/110 V PT)
One (1) Four position voltmeter selector switch

Two (2) Single pole, instantaneous under voltage relays with continuously variable setting range of 40%-80% of 110 volts.

Four (4) HRC control fuses

One(1) Timer having a delay of 0.5 Sec to 3 Sec on pick up with 2 NO self reset contacts suitable for 220 V DC .

G) **Module Type H (Isolating Switch Module)**

One (1) Triple pole load break isolating switch
One (1) Neutral link.

H) **Module Type KI (Non Reversible Motor Rated Below 30 KW Controlled from MCC)**

One (1) Triple pole fuse switch unit with three pole load break isolating switch and three HRC fuses.

One (1) Triple pole contactor

One (1) Bimetallic thermal overload relay with single phasing preventorTwo (2) Push buttons

Three (3) Indicating lamps with resistors and colored lenses

One (1) HRC control fuse
One (1) Control link.

I) **Module Type K11 (Non reversible Motor Rated 30 KW to below 110 KW Controlled from MCC).**

Similar to module type K1 but with the following additions

One (1) Current transformer for metering

One (1) Ammeter

One (1) Single -pole switch and fuse for motor space heater.

J) **Module Type K2 (Non Reversible Motor Rated below 30 KW Controlled from Remote Control Panel)**

One (1) Triple pole switch fuse unit with three pole load break isolating switch and three HRC fuses.

One (1) Triple pole contactor

One (1) Bimetallic thermal overload relay with single phasing preventer Three (3) Indicating lamps with resistors and colored lenses

One (1) HRC Control fuse
One (1) Control link

One (1) 'Normal' / 'Trial' selector switch
One (1) Auxiliary contactor.

K) **Module Type DK2 (Non Reversible Motor Rated Below 30 KW Controlled**

from PLC)

(Similar to module type K2 without 'Normal'/ 'Trial'/ selector switch but with two (2) coupling relays..).

L) **Module type K2/DK21 (Non Reversible Motor Rated 30 KW to below 110 KW Controlled from Remote Control Panel/PLC)**

(Similar to module type K2/DK2 but with the following additions) One (1) Current transformer for metering

One (1) Ammeter

One (1) Single-pole switch and fuse for motor space heater.

M) **Module Type K3 (Non Reversible Motor Rated Below 30 KW Controlled Locally)**

One (1) Triple pole fuse switch unit with three pole load break isolating switch and three HRC fuses.

One(1) Triple pole contactor

One (1) Bimetallic thermal overload relay with single phasing preventer Three (3) Indicating lamps with resistors and colored lenses

One (1) HRC control fuse One (1) Control link.

N) **Module Type K31 (Non Reversible Motor 30 KW to below 110 KW controlled locally)**

(Similar to module type K3 but with the following additions)

One (1) Current transformer for metering One (1) Ammeter

One (1) Single pole switch and fuse for motor space heater.

O) **Module Type NI (Reversible Motor Controlled from Remote Panel)**

One (1) Triple pole fuse switch unit with three pole load break isolating switch and three HRC fuses.

Two (2) Triple pole mechanically interlocked, forward and reverse contactors. One (1) Bimetallic thermal over load relay with single phasing preventer. One (1) 'Normal' / 'Trial' selector switch.

One (1) Indicating lamp with resistor and colored lens. One (1) HRC control fuse

One (1) Control link.

P) **Module Type DN1 (Reversible Motor Controlled from PLC)**

One (1) Triple pole fuse switch unit with three pole load break isolating switch and three HRC fuses.

Two (2) Triple pole mechanically interlocked, forward/reverse contactors. One (1) Bimetallic thermal overload relay with single phasing preventor. One (1) Indicating lamp with resistor and colored lens.

One (1) HRC control fuse One (1) Control link

One (1) Auxiliary contactor

Two (2) Coupling relays

ANNEXURE - I

TECHNICAL INFORMATION

1 Applicable Standard : IS 8623

2 Enclosure : Single Front

3 Protection of Enclosure : IP52 for indoor

4 Location : Indoor.

5 Rated voltage : 415 V

6 Rated control voltage : 110 V AC

7 Bus Bar system : TPN , Aluminium

8 Bus Bar rating : As Required
9 Short time rating : 50 kA for 1 Sec

10 Power frequency withstand voltage : 2.5 kV for 1 min for Bus Bars & Breakers , Switches & Contactors

2 kV for 1 min for Relays , Timers , Transformers

11 Interrupting capacity of breakers : P1 for MCCB & P2 for ACB 12 Duty of power contactors AC 3 for non reversible & AC 4 for reversible

13 Duty of auxiliary contactors : AC 1

14 Category of switches : AC 23 for fuse switches & AC 22 for auxiliary devices

15 Type of HRC fuses : Current limiting

16 Rating of HRC fuses : 50 kA

17 Type of control transformer : Dry type, 415/220 V of adequate rating 18 Type of potential transformer : Dry type, 415/110 V of adequate rating 19 Cabling for power circuits : Cable alley for external cables , Modules for internal cables below 70 mm2 & in

separate cable chamber for 70 mm2 and above

20 Cable entry : Bottom/Top

21 Cabling for control circuits : 1.5 mm2, 660 V PVC

22 Earthing : Main Bus- Aluminium 300 mm2 and Vertical Bus-150 mm2

23 Dimension of a single panel : As required subject to Owner's approval

24 Paint & Finish : Panel outer surface- Smoke Grey Panel inner surface -glossy White

Chassis- Zinc passivated Command module-Aluminium anodized Name plate-Non rusting material Lettering-White non graved on black back.

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