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CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
(CSIR, Ministry of Science & Technology, Govt. of India)
H.Q.: Barwa Road Campus, Dhanbad – 826 015 (Jharkhand), India

NIT No.CIMFR/PUR/14(1)2010

Date:16.07.2010

NOTICE INVITING TENDER (GLOBAL)

Director, CIMFR invites sealed tenders (In two Bid System) for supply, installation and commissioning of the following stores :-

Item No.	Particulars of Item	Qty.
1.	Supply, Erection, Installation, Commissioning and successful demonstration of Water Treatment Plant for Mine Water Treatment and making suitable for drinking purpose at Pootakee – Balihari Area (BCCL) in Jharia Coalfield, Dhanbad on Turn Key Basis.	01 Unit
2.	Design, Development, Fabrication, Installation and Commissioning of the Pilot Plant for Coal-to-Liquid Process Development.	01 No.
3.	Upgradable X-Ray Diffractometer (XRD) with power supply system.	01 complete system
4.	Microscopic Photometer with Photo multiplier & complete set	01 No.

Last Date of Submission : 30.08.2010 Time: Up to 4.00 P.M.

Date of Opening : 31.08.2010 Time: 10.00 AM onwards

Details of the Tender Document is available at www.cimfr.nic.in

1 : 0326- 2388306/2388319

6 : 0326- 2296030/2381210

s/d

S.P.O. / S.O.(S&P)
For Director



CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
(CSIR, Ministry of Science & Technology, Govt. of India)
H.Q.: Barwa Road Campus, Dhanbad – 826 015 (Jharkhand), India

NIT No.CIMFR/PUR/14(15)2008

Date: 06.11.2008

NOTICE INVITING TENDER (Global)

Director, CIMFR invites sealed tenders (In two Bid System) for supply, installation and commissioning of the following stores.

Item No.	File No.	Particulars of Item	Qty.	T.D. Fee in DD*	EMD in DD/BG/BC
1.	CIMFR/PUR-14(5)2009	Supply, Erection, Installation, Commissioning and successful demonstration of Water Treatment Plant for Mine Water Treatment and making suitable for drinking purpose at Pootakee – Balihari Area (BCCL) in Jharia Coalfield, Dhanbad on Turn Key Basis.*	01 Unit	Rs.300.00	Rs.6,00,000/-
2.	13(2)/CIMFR/DC/18/10-11/PUR	Design, Development, Fabrication, Installation and Commissioning of the Pilot Plant for Coal-to-Liquid Process Development.**	01 No.	Rs.300.00	Rs.11,00,000/-
3.	CIMFR/PUR-14(5)2010	Upgradable X-Ray Diffractometer (XRD) with power supply system.	01 complete system	Rs.300.00	Rs.1,50,000/-
4.	13(2)/CIMFR/DC/10/10-11/PUR	Microscopic Photometer with Photo multiplier & complete set	01 No.	Rs.300.00	Rs.88,000/-

* No tender fees are required in case it is downloaded from the site www.cimfr.nic.in.

*** The Pre-Bid Conference of the above tender will be carried out for interested bidders only from 19.08.2010 and 20.08.2010 with the Project Leader/ Technical Committee. The interested bidders may contact the P.L. on Cell No.09835324263 or E-mail: singhak@yahoo.com. There shall be no amendment/revision/substitution to the bid after submission and during validity.'**

**** The Pre-Bid Conference of the above tender will be carried out for interested bidders only from 17.08.2010 and 18.08.2010 with the Project Leader/ Technical Committee. The interested bidders may contact the P.L. on Cell No.09431513809 or E-mail: sudip_maity@yahoo.com. There shall be no amendment/revision/substitution to the bid after submission and during validity.'**

Note: The Tender Document can be obtained from the Office of the Stores & Purchase Officer, CIMFR, Barwa Road, Dhanbad on written request on payment of the non-refundable and non-transferable tender document fees as stated above in the form of cross Demand Draft issued by a scheduled bank drawn in favour Director, CIMFR, payable at State Bank of India, Hiranpur Branch, Dhanbad from 19.07.2010 to 30.08.2010. CIMFR will not be responsible for non-receipt of the Tender Documents due to postal delay/loss in transit. The tender complete in all respect along with EMD should reach to this office on or before 30.08.2010 before 4.00 PM and will be opened on 31.08.2010 at 10.30 AM onwards at CIMFR H.Q.

Tender Documents with detail terms & conditions can be downloaded from our website: www.cimfr.nic.in. Tender fees will not be required if it is downloaded from the website up to the tender sale period. The required EMD as stated above in the form of DD or BG must be enclosed in the Technical Bid failing which the offer will be treated as non-responsive.

Director, CIMFR reserve the right to accept or reject in part or in full to any or all the tender without assigning any reason thereof.

' : 0326- 2388306/2388319

6: 0326- 2296030/2381210

S/d
S.P.O / S.O.(S&P)
For Director

CENTRAL INSTITUTE OF MINING AND FUEL RESEARCH
(An ISO 9001 Institute)
(Council of Scientific & Industrial Research)
H.Q : Barwa Road , DHANBAD-826015,Jharkhand,India

Item Sl.No.01 →

NIT NO.CIMFR/PUR/14(1)2010

Date:16.07.10

Sealed tenders, in two parts (**Part A-** Technical & Commercial and EMD, **Part B-** Price, in separate sealed covers) in duplicate, are invited for design, supply, construction, commissioning and successful demonstration of a ***Mine Water Treatment Plant at Pootakee- Balihari Area (BCCL) in Jharia Coalfield, Dhanbad*** on Turn Key Basis, complete with accessories, instrumentation and data acquisition system from established, reliable, technically & financially sound manufacturer or suppliers who have successfully manufactured/fabricated, installed and commissioned one similar type plant as a complete package for any Govt./Semi-Govt. /Public or reputed organizations. R & D organization with sufficient experience of Water Treatment Plant & also having the above experience may also apply.

The interested parties are requested to obtain the Tender paper on payment of Rs. 5000.00 (Non-refundable) in the form of demand draft drawn in favour of Director, CIMFR, payable at SBI, Hirapur branch, Dhanbad, India towards the cost of tender papers from purchase section either on request or in person or through Air mail/courier. These rates are exclusive of postage/courier charges etc. The tender paper may be obtained upto 30.08.2010 at 4 P.M. and the completed tenders must be submitted by **30.08.2010 at 4 P.M.** along with EMD of **Rs.6,00,000.00 (Rs. Six Lakhs Only)** or Bank Guarantee for the same amount valid for six month and sealed with **Part A**. The part A of the tender will be opened on 31.08.2010 fro. 10.30 AM onwards. Late Tender will not be accepted. The global NIT may also be referred to our web site www.cimfr.nic.in

Director, CIMFR reserves the right to accept or reject any tender without assigning any reason.

Director

Item Sl.No.01 →

CENTRAL INSTITUTE OF MINING AND FUEL RESEARCH
(An ISO 9001 Institute)
(Council of Scientific & Industrial Research)
H.Q : Barwa Road , DHANBAD-826015,Jharkhand,India

NIT NO.CIMFR/PUR/14(1)2010**Date:16.07.10**

Sealed tenders, in two parts (**Part A-** Technical & Commercial and EMD, **Part B-** Price, in separate sealed covers) in duplicate, are invited for design, supply, construction, commissioning and successful demonstration of a **Mine Water Treatment Plant at Pootakee- Balihari Area (BCCCL) in Jharia Coalfield, Dhanbad** on Turn Key Basis, complete with accessories, instrumentation and data acquisition system from established, reliable, technically & financially sound manufacturer or suppliers who have successfully manufactured/fabricated, installed and commissioned one similar type plant as a complete package for any Govt./Semi-Govt. /Public or reputed organizations. R & D organization with sufficient experience of Water Treatment Plant & also having the above experience may also apply.

The interested parties are requested to obtain the Tender paper on payment of Rs. 5000.00 (Non-refundable) in the form of demand draft drawn in favour of Director, CIMFR, payable at SBI, Hirapur branch, Dhanbad, India towards the cost of tender papers from purchase section either on request or in person or through Air mail/courier. These rates are exclusive of postage/courier charges etc. The tender paper may be obtained upto 30.08.2010 at 4 P.M. and the completed tenders must be submitted by 30.08.2010 at 4 P.M. along with EMD of Rs.6,00,000.00 (Rs. Six Lakhs Only) or Bank Guarantee for the same amount valid for six month and sealed with **Part A. The part A of the tender will be opened on 31.08.2010 from 10.30 PM onwards.** Late Tender will not be accepted. The global NIT may also be referred to our web site www.cimfrindia.nic.in

Site/Location: Purchase Section, CIMFR, HQ premises, Barwa Road, Dhanbad-826015

Time of completion: 08 (Eight) months

Last date of issue of tender: 30.08.2010 before 4 PM

Pre-bid conference at site: 19.08.2010 and 20.08.2010 at 11 A.M

Last date of receipt of tender duly completed in all respects at CIMFR, HQ, Barwa Road, Dhanbad upto 10.30 AM on 31.08.2010.

Part A of tender will be opened in presence of bidders or the duly authorized representatives who may wish to be present at CIMFR on **31.08.2010 at 3.00 P.M.**

Complete specification and details of individual terms & conditions are available in the tender documents.

Tender documents (Non-transferable) can be obtained from the office of Sr. Stores & purchase officer, CIMFR, Barwa Road, Dist. Dhanbad – 826015 during any working days between 10 A.M and 5 P.M.

Issue of the tender documents does not mean that the parties are considered qualified. After opening of Part A of the offer, the same will be scrutinized for the eligibility, qualification.

Earnest money Rs.6,00,000.00 (Rupees Six Lakhs Only) as A/C payee Demand Draft drawn in favour of Director, CIMFR payable at State Bank of India, Hirapur, Dhanbad, Code No. 1670 or Bank Guarantee for the same amount valid for six month should accompany the tender sealed in Part A. Tender received without earnest money will be invalid. The Earnest money will be liable to be forfeited, if the tenderer withdraws or amends, impairs or derogates from the tender in any respect within the period of validity of his tender. Part-B-Price part of those tenderer who are considered to be fully competent to do the work shall be opened only after fulfilling Technical & commercial criteria evaluated by a competent authority. The Earnest money of all unsuccessful tenderers will be returned as early as possible after the expiration of the bid-validity but not later than 30 days of the award of contract.

Canvassing in any form in connection with the tender is prohibited and the tenders submitted by the contractor who resort to canvassing are liable for rejection.

The tenderer shall quote price both in figure and words.

The prospective tenderer should inspect the site to fully acquaint himself about the site conditions and attendant facility, provisions etc. necessary for satisfactory execution of installation and commissioning. The purchaser in any circumstances shall entertain no claim whatsoever on any such ground, at any subsequent stage.

Earnest money will be forfeited if the manufacturer fails to commence the work as per letter of award.

Except writing price, the tenderer should not write any conditions or make any changes, additions, alterations and modifications in the printed form of tenders. Tenderers who are desirous to offer rebate the same should be brought out separately in the covering letter and submitted along with the tender.

Tender shall remain valid for a period of ninety (90) days from the date of submission of the tenders, during this period the tenderer shall not withdraw his offer. Sealed tenders shall be submitted in double sealed covers superscribed with the name of the unit, date & time of opening on both the inner and outer envelopes. They will be received up to 1.00 P.M on and Part A will be opened at 3.00 P.M on in the purchase section of CIMFR, Dhanbad. Tenders should be dropped in the tender box kept in the office of Stores & Purchase officer, CIMFR on or before the aforesaid closing date and time. In case these are sent by post these should be sent by Registered post/Speed post /Air mail addressed to CIMFR, Dhanbad. Tenderers are to ensure that they post the tender well in advance so as to reach before the closing time and date. No tender will be accepted after the closing date and time. The global NIT may also be referred to our web site www.cimfrindia.com.

CIMFR does not bind itself to accept the lowest tender and reserves the right to accept or reject any or all tenders received either in full or part thereof or to split the work among more than one vendor, if necessary, without assigning any reason whatsoever.

Director
Central Institute of Mining and Fuel Research,
H.Q : Barwa Road– Dhanbad 826015,India

CONDITIONS OF TENDERER

PREPARATION OF TENDERS

Before submission of tender the Tenderers are requested to make themselves fully conversant with the conditions of Tendering General Conditions, Special Condition, Site Conditions, Specifications, flow diagrams and all other relevant information so that no ambiguity may arise in these respects subsequent to the submission of the tender.

It shall be the responsibility of the Tenderer to request for any missing document. In absence of any such request the Tenderer will be deemed to have received and read all documents.

The Tenderer shall submit his tender strictly in accordance with the tender specification and the terms & conditions laid down in the tender document.

SUBMISSION OF TENDER

Tender to be submitted in two copies.

Tenders to be in two parts, unless otherwise instructed to the contractors, all tenders shall be submitted in two parts i.e.

(i) **Part A:** Technical and Commercial & EMD (ii) **Part B:** Price

List of documents to be submitted in Part A

- ◆ Tenderer's covering letter
- ◆ Signed NIT tender document in the first copy of tender.
- ◆ GA drawing of plant & equipment along with broad specifications.
- ◆ Full statement regarding the status and past experience of the tenderer. Documentary evidence regarding the satisfactory completion of work and their values are to be submitted.
- ◆ List of Man power & construction equipment/ workshop/manufacturing /testing facilities & resource available for this contract along with their present conditions/location.
- ◆ Income Tax and Sales Tax Clearance Certificates (Latest).
- ◆ Bankers certificate regarding the financial capability of the tenderer/solvency certificate from their bank.
- ◆ Other document as may be required to be submitted along with the tender.
- ◆ All tender papers shall be signed and returned with the first copy of the tender under part A
- ◆ A/C payee demand draft or Bank Guarantee of Rs.6.0 lakhs as EMD.

List of documents to be submitted in Part B

- ◆ Tenderer's covering letter.
- ◆ NIT document to be signed and returned
- ◆ Price should be quoted both in figure & in words.

Note: All documents of tender papers, drawings and documents shall be initialed at the lower right hand corner with ink only and signed where required by the tenderer or any person holding power of Attorney authorising him to sign on behalf of tenderer. All signatures shall be dated.

Number of Copies of Tender

The tender shall be submitted in two (2) copies each self-contained and complete in all respects except that NIT document to be signed & returned only with the first copy & confirmation regarding enclosure to be made in other copies.

Tenders to be Unambiguous

No alteration in the form of the tender or in the form of special stipulation will be permitted. If corrections are needed while filling in the tender, the same shall be made by the Tenderer with his signature. Tender which is incomplete, obscure or irregular or only for a part of the package/ schedule is liable to rejection.

Tenderer's Identity

The tender shall contain the name, residence and place of business of person or persons submitting the tender.

Authorization

In the event of the tender being submitted by a firm, it must be signed by each partner thereof, and in the event of the absence of any partner, it shall be signed on his behalf by a person holding a Power of Attorney authorizing him to do so, certified copy of which shall be enclosed.

Tenders submitted on behalf of companies registered under the Indian Companies Act, for the time being in force, shall be signed by the persons duly authorized to submit the tender on behalf of the company and shall be accompanied by certified copies of the resolutions, extracts of articles of association, special or general Power of Attorney and the other information to show clearly the title authority and designation of persons signing the tender on behalf of the company.

Delivery of Tender

The completed tender in at least two (2) copies with all its enclosures shall be submitted.

All the two copies of Part A: Technical and Commercial inscribing Tender Notice number, name of work for which tender is submitted, name of tender along with Part A: Technical and

Commercial & EMD with due date of opening

All the two copies of Part B: Price & EMD, shall be enclosed in a separate securely sealed envelope which shall be similarly superscribed but shall have the inscription Part B: Price.

If forwarded by mail, the sealed envelope containing the tender as per clause must be enclosed in another envelope properly addressed to Stores & purchase officer.

Personal delivery is recommended. Tenderers forwarding tenders by mail shall do so at their own risk and tenders received after due date and time will not be entertained. Telegraphic offers will not be entertained.

Qualification of Tenderers

Only such firms need to tender who can produce satisfactory evidence that they have the necessary experience and financial resources and organization to undertake such work as specified in the purchaser's tender document.

Notwithstanding any pre-tender check on qualification the purchaser reserves the right to undertake any post-tender evaluation of qualification of Tenderers, as he deems necessary.

AWARD OF CONTRACT

The right to accept a tender and award the contract to one or more than one Tenderer, if considered necessary, rests with the purchaser. It shall not be obligatory on the part of the purchaser to accept the lowest tender. The purchaser could be at liberty to accept any tender, lowest, or otherwise, in whole or in part and to reject any or all the tenders received, without assigning any reason, and no explanation can be demanded of him by any tenderer in respect thereto.

ABNORMAL PRICE

The tenderer is expected to quote price for each item after careful analysis of cost involved for the performance of completed items considering all specifications and Condition of contract. In case it is noticed that price quoted by the tenderer for any item or equipment is unusually high or low, it will be sufficient cause for the rejection of the tender, unless the owner is convinced about the reasonableness, after the scrutiny of the analysis for such price, to be furnished by the tenderer on demand.

Time for Completion

The time of completion is Eight Months
The time shall be reckoned from the 10th day of issue of award letter.

Training

Requisite training for operation and routine maintenance during defect liability period i.e one year after successfully hand over the plant should be provided by the successful Tenderer at CIMFR site free of cost.

AMC

Annual maintenance contracts as applicable after warranty period has to be provided and must be quoted separately as an optional item.

INCOME TAX AND SALES TAX CLEARANCE CERTIFICATES

The Indian tenderer shall furnish with the tender, Income Tax & Sales Tax Clearance Certificates (Latest) from competent authorities. The purchaser reserves the right to reject any tender if Income Tax & Sales Tax clearance certificates are not enclosed.

Entry tax will be paid by the contractor & the same will be reimbursed to the contractor by CIMFR after submission of necessary receipt by contractor.

DRAWINGS

Each tenderers shall forward in connection with this Tender, if any, drawings (a complete set with each copy of the Tender) and the drawings shall be duly marked so as to connect them with the tender to the satisfaction of the purchaser and shall be deposited by the Tenderer with his tender.

All drawings forwarded as part of the tender whether so required by any reference in the specifications or not shall remain the property of the purchaser.

SECRECY

The Tenderer (whether his tender is accepted or not) shall treat the details of the tender specification and other documents attached there to, as private and confidential & should maintained the secrecy of the Tender specification.

COMMERCIAL REQUIREMENTS**Price Schedule**

Please quote unit price and corresponding total amount for individual items.
quoted should also include the following separately:

The price

- ◆ Design, manufacture, testing and supply ex-works.
- ◆ Packing, forwarding & loading at your works.
- ◆ Sales tax, octroi, contract tax or any statutory levies. CIMFR, being an R&D organization is exempted from custom & excise duty. Necessary certificate on demand may be provided.
- ◆ Cost of imported measure items need to be as per the C.I.F. of principles offer.
- ◆ CIMFR is eligible for concession in Sales Tax, as applicable to Research/ Educational Institute for purchase of scientific Equipment/ Instrument.
- ◆ Delivery to CIMFR site- Transportation charges.
- ◆ Entry Tax – If entry tax is to be paid on certain items of the project the tenderer have to pay directly to local sale tax department.
- ◆ Road Permit- The tenderer have to registered with local sale tax department for requirement of road permit for transportation of goods in the state of Jharkhand at CIMFR, Dhanbad.
- ◆ Insurance – The entire material of equipment of the plant should be insured from manufacturing to commissioning.
- ◆ The consignment be dispatched on door-delivery and freight paid basis and unloading and transferring consignments in to equipment/machinery/materials storage shed of the purchaser will be arranged by the Suppliers and not by the purchaser. The price should include or be fully qualified in respect of all items of expenditure, including cost, incidentals to execution of this order. All charges should be shown separately in words and figures.
- ◆ Statutory clearance to be provided by the Agency.

- ◆ LPG cylinder will be supplied by the Agency with the help of CIMFR and number of cylinders to be checked by the Agency and if required cylinder with heating system will be supplied.
- ◆ During erection and commissioning all the consumables including LDO to be supplied by the Agency.
- ◆ Electrical charges at present rate is Rs. -----/unit
- ◆ Accommodation if available at the time of requirement by the supplier may be provided as per prevailing market rate.

Program

In the event of work being awarded to you, you will submit and update at regular intervals a bar chart program for the raw material procurement, manufacture/fabrication, testing, supply & commissioning of the items covered under scope of work.

Guarantees

The equipment of your supply shall be guaranteed against defects for a period of 24 months from the date of hand over of the plant. Any defects in quality and workmanship of materials noticed during this period have to be rectified/replaced by you at your cost to the entire satisfaction of the purchaser. You have to provide performance and design guarantee where complete design is in your scope. You have also to provide materials test certificates etc. wherever necessary.

You shall guarantee the performance of the equipment, machinery and materials designed and supplied by you as per the parameters suggested in our specification. For establishing the guaranteed performance you will run the equipment for a specified period of time.

SPECIAL ADVICE TO THE TENDERER

The bidder is strongly advised to visit the Plant area personally so as to assess the quantum of work involved. The bidder is also advised to verify the status of the place, Substation, Switch room and the Stores where certain equipment have to be modified or replaced. It is also advised to check up the current labor situation as well as the political scenario prevailing in the area. Any extra claim citing the aforesaid grounds shall not be entertained after the award of the contract.

The analysis of Coal Mine water available at BCCL site is as follows:

Given in Annexure-II

KEY PARTICULARS OF THE OFFER
(To be filled by the Tenderer)

1. Offer fully complying with the requirements Stipulated in the Technical Specification (TS)?
2. Name and address of Tenderer :
3. Stage wise power requirement for construction and erection work.
4. All the enclosed schedules duly filled up & furnished along with the tender?
5. List of bought out equipment & their source of supply.
6. Drawing furnished?
7. Whether all data/ drawing /documents/ Information furnished along with this Tender as per TS?
8. All tests at manufacture's works shall be carried out in presence of Purchaser/Consultant as per TS?
9. Confirm painting of all equipment shall be done as per TS.
10. Reference lists of similar systems already installed and operating elsewhere.

Seal of Company:

Signature of the Tenderer

Name.....
Designation.....

IMPLEMENTATION CHART
(To be filled up by the Tenderer)

The successful Tenderer shall complete the entire project as per the requirement

S. No.	Activity	Date from LOI (in weeks)
1.	Preparation of Basic & Detailed Engineering drawings, Submission & approval	
2.	Placement of order for bought out items	
3.	Supply of materials to site	
4.	Erection	
5.	Testing & Commissioning	
6.	Performance Guarantee	

Note: The Tenderer shall also submit Bar Chart

Seal of Company:

Signature of the Tenderer

Name.....

Designation

1.1 INTRODUCTION

Central Institute of mining and Fuel Research (CIMFR) a constituent of Council of Scientific & Industrial Research (CSIR) under the Ministry of Science of Technology, Govt. of India, devoted to the research and development towards the Eco-friendly mining and dedicated to the development of modern technology for the country. CIMFR is interested for supply, installation, commissioning and successful demonstration of Water Treatment Plant for mine water treatment for drinking purposes at PB Project site in Jharia Coalfield, Dhanbad on turn key basis. CIMFR has undertaken a Project **“Development of Cost-effective Mine Water Reclamation Technology for Providing Safe Drinking Water”** under XI Five Year Plan in which it is proposed to install a pilot plant for mine water treatment and to make it available to local habitants.

1.2 The intent of this Tender Specification is to furnish the required technical details/design drawings to enable the Tenderer(s) to submit their best offer for supply, erection, testing commissioning & performance guarantee of Coal Mine water Treatment Plant at Pootakee, BCCL in Jharia Coalfield, Dhanbad as per scope of work.

The provision given in these documents shall be complementary to one another. However, in case of any conflict between the provisions made in these documents with regard to Technical Specification, the order of priority amongst various documents shall be as specified below:

- i) Tender Specifications
- ii) GCC
- iii) Invitation to Tender

The scope of work will consists of complete supply, fabrication, installation and commissioning cum demonstration of Water Treatment Plant including its civil structures and site design construction. The basic purpose of the pilot plant is to treat mine water available at the installation site and to provide it to local residents for drinking uses. The treatment process comprises following steps to separate impurities present in coal mine water to make it suitable for the purpose of drinking:

- a) Separation of suspended impurities
- b) Separation of dissolved solids including heavy metals
- c) Removal of microorganisms

The plant envisages production of 3000 liter of treated water per hour on continuous basis.

For this plant a process flow diagram has been developed which has been attached along with a list of necessary equipments with specifications (**Annexure-I**). Detail specification, list of equipments and flow diagram may be found at the CIMFR website (www.cimfr.nic.in).

In the first step suspended impurities will be separated using polyelectrolyte or other chemicals for fast settling. For separating the dissolved salts, a special material (developed by NML, Jamsedpur) will be used. This process will take place at predetermined conditions like pH, temperature etc. These conditions are to be maintained by automation control. The reaction products in the form of suspended particles will be separated in a clarifier and finally through a filter. For removing microorganisms ozone treatment will be carried out. For supplying ozone an ozone generator will be used.

Connectivity of different units with pipelines has been shown in the flow diagram. Flanges are mostly used. Material of construction and pipe sizes are also shown therein.

Mild steel structural materials like channels, angles and other plates are required for supporting most of the equipments. Different units are to be supported at different heights to ensure proper flow of water from one unit to the other. The exact height and location has to be worked out at the time of erection by the successful vendor.

Necessary power for running the plant shall be available. Vendor may make estimate of requirement. Electrification and erection of an appropriate shed for housing the plants and equipments as per the lay out should also included in the offer.

2.2 The offered system shall meet all the requirements given in and this should be suitable for the experiments required to be carried out.

2.3 The Tenderer along with the offer shall submit the following documents/drawings/details

i) General

- a) Layout of the proposed units of Coal Mine Water Treatment Plant.
- b) Back up calculations for the sizing of the all equipment, instruments after receiving purchase order.
- c) Manufacturer's catalogues/technical catalogues of all equipment & instruments after receiving purchase order.
- d) Technical Specification of equipment, instruments & auxiliary materials
- e) Bill of material for bricks, mortars, castables, equipment, and auxiliary materials after receiving of purchase order.
- f) Operational Philosophy of the Coal Mine Water Treatment Plant. .
- g) Reference list of earlier supplies for similar equipment.
- h) Implementation Schedule of the Project.

ii) Mechanical

- a) Layout of the proposed Plant.
- b) Broad specification of each equipment

iii) Electrical

- a) The control philosophy of the operation.
- b) SLD of MCC, connected load, maximum demand and average demand of the offered system.
- c) GA of MCC with approx. dimensions (W X D X H) and approximate weight. Tenderer shall submit general arrangement drawing of proposed MCC etc
- d) Technical leaflets containing broad technical specification for Electrical air pre heater & Temperature controller.
- e) Duly filled in technical schedule shall be submitted by the Tenderer along with the offer

iv) Instrumentation

- a) Process & Instrumentation diagram
- b) Schedule of control and instrumentation system with broad technical specifications and data sheets for individual instruments
- c) Schedule, circuit diagram etc
- d) Power supply schemes

2.4 Drawings & Documents for approval of Purchaser:

The Successful Tenderer shall submit in four sets the following drawings and documents for approval of the Purchaser/ Purchaser's consultant:

i) Mechanical

- a) GA drawing of equipment showing plan, elevation, and view and relevant cross-sectional views.
- b) Detail specification of each equipment along with a copy of referred code/ references.
- c) Detail specification of each equipment along with indicating therein make, type and rating of all components.
- d) Operation and control philosophy.

ii) Instrumentation

- a) P & I diagrams, control system architecture diagram equipment specifications.
- b) Application information, specification sheet and technical data of all equipment and major components.

iii) **Civil & Structural**

- a) Design, General Arrangement (along with load data for RCC foundations) and other detail working drawings for RCC over head reservoir, RCC mine water storage, equipment foundations and other civil works for the shed, equipment, trenches etc. and all other civil & structural works required for the successful commissioning of the project. Civil & structural work required for the shed is in the scope of the supplier & the GA drawing for the same should be incorporated in the Technical document.
 - b) Brick work will be 3.00 mt height on three sides and required size of rolling shutter side to be made.
 - c) 3D drawing of layout of equipment and instrument to be submitted after receiving the order and before submission of final drawing.
 - d) Building inside & outside illumination as per Industrial practice are to be provided.
- 2.5** The Successful Tenderer shall be responsible for the proper erection of the system along with all accessories as per recommended procedure of manufacturer and approved drawings. The erection work shall be carried out as per modern engineering practice with the help of skilled & experienced workforce. The successful Tenderer shall use his own tools & tackles required & provide sufficient manpower for erection, testing & commissioning of these systems and interconnecting piping.
- 2.6** On completion of erection work, all the systems shall be tested along with the associated equipment for proper performance.
- 2.7** Commissioning spares for critical equipments are to be specified and supplied along with the system by the Tenderer.
- 2.8** The list of insurance spares adequate for this purpose shall be submitted.
- 2.9** The Tenderer shall confirm the supply of all consumables required for erection, testing & successful commissioning of the system. List of consumables, if, any, for the operation and maintenance of the system shall be furnished and shall be quoted separately.
- 2.10** The Tenderer shall furnish a list of fast wearing spares.
- 2.11** List of two years operational spares is to be mentioned by the Tenderer,
- 2.12** The Tenderer shall comply with this specification and "General Conditions of Contract" and "Invitation to tender" given by the Purchaser along with this tender specification.
- 2.13** The building, RCC raw water storage and RCC Over head Reservoir shall be designed and provided as per relevant Indian standard.
- 2.14** Control –cum office room shall be single storied flat roofed with sides covered with brick masonry inside the main building.
- 2.15** All brick masonry walls shall be plastered with cement sand mortar (1:6) on both sides. Thickness of plaster shall be minimum 18 mm for external surfaces and 12 mm for internal surfaces of walls. Thickness of plaster for ceiling shall be minimum 6mm. Proportion for RCC work of Over head reservoir and ground water storage will be 1:1.5:3 or M-20 grade including 6 mm thick cement plaster of mix 1:3 (1 cement : 3 fine sand) with asphalt lining.
- 2.16** All outside plastered surfaces of masonry walls shall be applied with water proofing cement based paint of approved make and quality and to be applied as per manufacturer's specification .Inside surfaces of masonry walls shall be treated with white wash/colour wash or paint of approved quality , make and colour or to be tiled as the case may be , on the basis of technological requirements.230 mm high skirting shall be provided in all rooms except where there is a provision for dado. The finishes to be provided are as follows :

Area

Finish

- a) General areas in main building: Two (2) finishing coats of white wash over a coat of primer.
- b) Control cum office room: Plaster of paris finish & two (2) finishing coats of plastic emulsion paint of approved shade over a coat of primer.

Standard types of doors & windows shall be used. All steel doors shall be of standard design using sections as per IS:1038 and IS:1081 incl. All steel windows shall be of standard design steel windows and fully glazed (4mm) thick conforming to IS: 1038 and IS: 1081. Synthetic enamel paint shall be provided to all doors & windows.

All steel structures & all concrete and reinforced concrete structures shall be designed in accordance with relevant IS code. Painting to steel structures conforms to light corrosive service painting as per the best engineering practice.

Other additives like floor hardening, heat resisting, fire resisting and water proofing components shall be added depending on requirements.

2.17 BATTERY LIMIT

For power supply take over point shall be tapping of power from outgoing terminals of Purchaser's main LT board located at an approx. cable route distance of 50 meters from the proposed Coal Mine water Treatment Plant site.

Lightening arrester to be provided and separate pit to be made by the Agency. Sodium vapour lamp at inside and outside and FL lamp in control room to be provided by the Agency.

Earthing pit to be made for whole plant including all the equipment.instrument.

Shock treatment chart to be provided in the plant.

2.18 PURCHASER'S OBLIGATION

- i) Water and electricity as required for the project work shall be supplied by the Owner on chargeable basis as per CIMFR rates as follows:
 - a) Water @ 1% of total civil works.
 - b) Electricity at actual
- ii) Pootakee – Balihari Area (BCCL) in Jharia Coalfield, Dhanbad will provide only space within their complex for setting the Coal Mine Water Treatment Plant.
- iii) The Tenderer may indicate any other requirements, which are to be provided by the Purchaser.

3.0 TECHNICAL SPECIFICATION:

SITE CONDITIONS:

The proposed water treatment plant will be installed at PB Project site in Pootakee Balihari Mining area of Jharia Coalfield. The PB Project site is located about 15 km south of Dhanbad. Dhanbad is well connected by train and road with the other part of the country including Kolkata and New Delhi. The nearest International air port is at Kolkata which is at distance of 259m km from Dhanbad.

3.1.1 Climate Conditions

The area lies in the tropical region with fairly wide temperature variations between winter and summer. The climate of the Jharia area is characterised by very mild winters and hot wet summers. In the area, rainfall mostly occurs in the period of monsoon (June to September). Meager rainfall due to conventional thunderstorms occurs in the months of April and May. The rainfall during winter occurs occasionally associated with western disturbances. The maximum temperature of the coalfield rises up to 44°C during May-June while it dips to 5° to 7°C in December-January. The annual rainfall in area and adjacent regions varies from 1000 to 1200 mm.

3.2 BASIC DESIGN : See Annexure –I (Flow Diagram)

3.3 MECHANICAL EQUIPMENT – See List of Equipment in Annexure-I

3.3.2 Equipment Specifications - See List of Equipment in Annexure-I

3.4 UTILITY EQUIPMENT :

3.5.1 Supply of Materials

Inspection & Storage

3.5.2 Equipment Specification. See List of Equipment in Annexure-I

3.5.3 Supply, Inspection & Storage

3.5.3.1The Successful Tenderer shall carry out inspection at the works of the Manufacturer for all required materials in his scope of supply, receipt at Dhanbad, to cross-check the quality, a second inspection may be carried out by the Purchaser and/or Consultant. The materials shall be finally accepted if the results obtained in the second inspection are in conformity to the specification. During inspection at Manufacturer's premises the Purchaser may at his sole discretion depute his authorize representative (s) to witness inspection.

3.5.3.2 Quality will be checked on the following aspects.

- i) Visual inspection on manufacturing defects.

- ii) Inspection for physical & chemical properties.
- iii) Inspection on damages due to packaging &/ transport.

3.5.3.3 The Tenderer shall do procurement, inspection, supply and safe storage of all refractory materials & all auxiliary materials.

3.6 ELECTRICAL

3.6.1 The scope of work for Electrical will include:

- i) Electrical Air Pre Heater
- ii) Control Panel.
- iii) Motor Control Center
- iv) LT Motors
- v) Local Control Stations
- vi) All LT power and control cables, cable trays, cabling materials & accessories, GI conduits, conduit fittings and materials etc. as required within the battery limits
- vi) Tapping of power, including cables, from outgoing terminals of Purchaser’s Main LT board and located at an approx. cable route distance of 50 metres.
- vii) Laying and termination of all cables under the scope.
- viii) Earthing of all electrical equipment & connecting it with existing earth mat.
- ix) The Coal Mine Water Treatment Plant shall be complete in all respects and any device or feature not included in this specification, but are essential for the desired functioning of the equipment, shall be deemed to be within scope of the specification whether specifically mentioned or not.

3.6.2 General Conditions & Design Criteria

3.6.2.1 All equipment shall be designed for smooth efficient and trouble- free operation in tropical humid climate having maximum relative humidity of 100% and maximum ambient temperatures is 50⁰ C. All electrical equipment and accessories fittings etc. shall be standardized to reduce inventory. Ease of operation equipment and facilities.

3.6.2.2 Power Supply

The power supply system available shall be as follows:
 415 V:3-phase, 4-wire, 50 Hz: Earthed system, short- circuit level: 50KA for 1s. the above power supply will have a range of variation as follows:

Voltage	± 10 percent
Frequency	± 5 percent

3.6.2.3 Cables

- i) LT power cables shall be 1.1kv grade multicore PVC insulated armoured & PVC sheathed aluminum cables.
- ii) Minimum size of multicore aluminum LT power cables shall be 6 mm².
- iii) Control cables shall be stranded 2.5 sq. mm. Copper
- iv) In general, cables shall be laid in open in cable racks. Concealed conduit wiring shall be adopted depending upon specific requirements of a particular application.

3.6.3 Equipment Specification

3.6.3.1 Squirrel Cage Induction Motors

All the LT Motors shall be Squirrel Cage Induction Motor, suitable for 415 V, 3phase 50Hz A.C shall conform to following standards:

IS:325-1996	Induction motor, performance
IS:4722-1992	Rotating Electrical machine
IS:1231-1974	Dimensions of three phase foot mounted motor
IS:4691-1985	Degree of protection provided by enclosures.
IS:900-1992	Code of practice for installation, maintenance
IS:4029-1967	Guide for testing three phase induction motors.
IS:7816-1975	Guide for testing insulation resistance of rotating machine.
IS:2253-1974	Designations of types of construction and mounting arrangement of rotating electrical machine.
IS:6362-1995	Designation of methods of cooling for rotating electrical machine.
IS:4728-1975	Terminal markings for rotating electrical machinery.

Design basis

- i) The temperature rise of the stator winding shall be restricted within 70°C over the specified ambient of 30°C when measured by resistance method for class-F insulation. The motor nameplate rating shall correspond to the specified ambient temperature of 50°C as well as of 40°C.
- ii) The Motor shall be able to start the driven equipment with rated load capacity and accelerate up to the rated speed satisfactorily under most arduous condition with 80% voltage at the terminal.
- iii) The Motor shall be suitable for DOL (Direct-on-Line) start through contractor/ molded case circuit breakers, Starting current shall not exceed 6 times full load current. The manufacturer shall include necessary and appropriate surge suppresser in the motor terminal box if considered necessary by him or indicate categorically the limitations of the motor.
- iv) The Motor shall be reversible type i.e. rotation in the both clockwise & anti clockwise directions.
- v) The cooling of the Motor shall be self ventilated type, totally enclosed fan cooled (TEFC) with method of cooling IC –o, 141. The cooling fan shall be directly mounted on the shaft (NDE) and shall be suitable for both clockwise and anti clockwise rotation.
- vi) The motor shall be capable to withstand sudden application of 150% of rated voltage for phase difference between incoming voltage and motor residual voltage.

General Constructional & Other Features

- i) Winding
 - a) **The winding shall be of copper and with class F insulation However, for class F insulation temperature rise shall be limited to 70°C over design ambient temperature of 50°C.**
- ii) Bearing
 - a) **The bearings shall be self-lubricated by grease.**
 - b) **Grease lubricated bearings shall be pre-lubricated and provided with in service lubrication facility with drain to avoid over lubrication.**
 - c) All items like grease nipples etc shall be easily accessible and lubrication shall be possible without removal of guarding.
- iii) **Grounding**
 - a) Each motor frame shall have two distinct grounding pads, one on each side and complete with tapped hole and bolt.
 - b) Main cable terminal box & auxiliary terminal boxes shall have separate grounding pads, tapped holes & bolts.

- c) The size of the earth connection of the motors to the shop earth grid shall be as specified in IS 3043-1987.

iv) Motor Terminal Box

The terminal boxes shall be spacious, dust and water proof with degree of protection same as that of the motor.

Noise Level

The noise level shall be per IS-12065 (1987).

Tests

- a) All Routine tests, as per relevant IS standards shall be carried out on the Motor.
 b) Test certificates for all routine tests shall be furnished to the customer in four (4) copies prior to despatch for approval and despatch clearance.

3.6.3.2 Motor Control Center (MCC)

- i) **The motor Control Centre (MCC) shall conform to IS 8623 (part-1)- 1993, (part-2)- 1993. The degree of protection shall be IP-52.**
 ii) MCC shall cater to all electrical loads Coal combustion Test Rig unit. MCC shall have one incomer. All the incomer and outgoing feeders of the MCC shall be fully fixed type modules. All incomer and motor feeding cubicles of MCC shall have MCCB as circuit breaker. The switchboards shall be of sheet steel, cubicle type, free standing, enclosed, factory built assembly for indoor use. The switchboards shall be designed for 415V, 3-ph, 4-wire 50 Hz power supply system & rated for 1100 V insulation voltage. Separate busbar compartment shall be given at the top for housing the main busbars. Busbars shall be extended to the full length of the compartment. Vertical busbars shall have the rating corresponding to the breakers/switches connected with it.
 iii) **Bus bar shall be capable to withstand the fault current of 50 kA for 1 sec and peak short circuit current of 84k Amps. Arrangement and spacing of the busbars shall be made in such a way that it can withstand the fault level as specified. The bushing of bus bar shall be capable to withstand thermo-mechanical shock arising out of heating of busbars during short circuit.**
 iv) Control Circuit voltage for MCC modules shall be 240 V AC. MCC shall have its own control. The control transformer shall have fuse & MCB protection on primary side as well as in the secondary side.
 v) All non draw-out modules of MCC shall have adequate nos. of sliding type auxiliary contacts rated for 240 V, 5A, A.C, AC-11 duty.

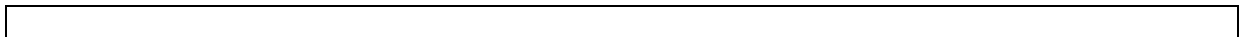
Other Features of MCC:

- i) 20% Spare terminals in the control terminal block shall be provided for future use.
 ii) Earthing terminals 2nos. shall be provided at the two opposite ends of the MCC for connection with external earth connections.
 iii) Identification label of suitable size on lamicoid sheets or anodised aluminium sheets shall be given for the switchboard and for the cubicles.
 iv) Danger boards, electrically insulated rubber mat as required shall be given in the floor in the front of the switchboard.
 v) Base channel for mounting the distribution board as required shall be provided and installed.

3.6.3.3 MCCB

The MCCB used in the MCC shall conform to IS:13947 Part -1&2 (1993). The short circuit breaking capacity of MCCBs shall be 50 kA for 1 second and these shall be designed for type-2 co-ordination as per IEA-292-IA.

3.6.3.4 Control Panel



3.6.3.5 Cleaning, Painting and Protection

- i) All sheet steel equipment shall undergo rigorous metal treatment by a modern 9- tank process. Panel finish shall be white inside and out side shall be shade no. 631 of IS 5: 1994.

3.6.3.6 Cables

- i) L.T. Power & Control Cables
 LT power and control cable shall be 1.1KV grade multicore heavy duty PVC insulated, PVC sheathed steel wire armoured with stranded aluminium conductor as per IS: 1554 (Part-1) - 1988 cables shall be suitable for steady conductor temperature of 70°C. The insulation of inner and outer sheaths shall be of extruded PVC as per IS 5831-1984.
 Heat shrinkable type cable termination kits shall be used. The technical particulars of cables shall be submitted.

3.6.3.7 Conduits

The rigid conduits shall comply with clause No. 5.1 C of IS 9537 - 1981 (Part II).

3.6.3.8 Cable Trench

If required suitable cable trench to be made for cable laying.

3.6.3.9 Cable Racks

- i) Cable racks made of MS angles and flats shall be provided inside the cable trench.
- ii) Ladder type cable racks of 450/300-mm width shall be used. It will be fabricated from 50 x 50 x 6 MS angles for longitudinal members and 25 x 6 MS flats for cross members placed at an interval of 300 mm along the length of the rack with a provision of double cross members at a distance of 600mm for cable clamping. Length of single piece of cable rack shall be 3 metres.
- iii) Supporting MS brackets for the support of cable racks shall be provided at an interval of 1500mm. Brackets shall be made of 65x 65 x 6 mm MS angles.

3.6.3.10 Earthing

The earthing (grounding) of the entire Coal Mine Water Treatment Plant unit shall be carried out by the Contractor in accordance with IS:3034-1987. Earthing pit to be made for whole plant including all the equipment/instrument.

3.6.3.11 Lists of Preferred Makes of electrical items are as follows.

3.7 Proposed Instrumentation System

3.7.1 Data Acquisition System (DAS)

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3.7.2 Equipment Specification: See Annexure-I

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3.7.3 Total control schedule

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3.8 CIVIL WORKS

- a. Dimension of New shed is 26 m x 20m (approx).
- b. Structural column is to be fixed at 3.50 m center to center distance on RCC footing, MS roof truss including purlins, corrugated galvanized iron roof sheeting 0.80 mm thick as per IS: 272 with vertical side sheeting.

- c. 1st Class brick work for wall along with 15mm cement plaster 1:6 will be provided around the building keeping provision of steel doors, steel windows and one M.S. Rolling Shutter standard size as per Industrial requirement.
- d. All foundations of equipments and supporting structures like platform, stair will be M-20 grade ie, 1:1.5:3.
- e. RCC works for Mine water storage rectangular tanks each having capacity 50,000 litres (size: 7.00 m x 5.00 m x 1.50m) will be M-20 grade with asphalt lining including necessary nozzles, overflow drains etc as per direction at site.
- f. R.C.C work M-20 grade will be provided for treated water reservoir (1 No) of capacity 12,000 liters (size : 3.00 m x 2.00 m x 2.00 m) with necessary inlet, outlet, overflow nozzles, Manhole including drain, Provision of level indicator and liver alarm etc with asphalt lining.
- g. RCC work M-20 grade with asphalt lining for Overhead water storage (1 unit) capacity 50,000 litres including water inlet, outlet and vent, providing and fixing GI pipe as per nearby source of mine water level indicator and level alarm with MS stair case. The height of the tank 18.00 m.

3.8.1 Materials and Workmanship Specification

3.8.1.1 Cement

Cement shall be either ordinary Portland cement conforming to IS: 8112-1989 or Portland Blast furnace slag cement conforming to IS:455-1989. It shall be fresh and fit for use.

3.8.1.2 Stone Aggregates

The aggregates shall be obtained from crushing of sound stones and the physical quality in respect of size, gradation and strength shall conform to the provision of IS 383-1970.

3.8.1.3 Fine Aggregates

Fine aggregates (sand) shall be either river sand or pit sand and the quality shall conform to the provision of IS 383-1970.

The preparation, placing and curing of concrete shall conform to the provision of IS 456-1978.

3.8.1.4

The floor base shall be cement concrete (thickness 100mm) laid on 75mm thick C.C 1:4:8 well-compacted sub grade and metallic hardener floor finish shall be with 40mm thick cement concrete grade M15 with 10 mm and down graded stone aggregates. Cement punning shall be applied on top of the RCC floor base while it is in green state.

3.8.1.5

Drain shall be provided all around the apron and shall be lead to final discharge drain/low lying area. The drains shall be constructional in brick works with.

3.8.1.6

All other works not mentioned herein shall be carried out as per provision of latest IS codes.

3.9 STRUCTURAL WORKS

3.9.1 General Description of Structures

The following gives only general description of structural units. The structural works shall not be limited to these but shall be guided by technical/technological aspects for the total scope of the work.

- i) Working platforms at different places depending on requirement
- ii) Chimney for letting out waste gas conforming to pollution control regulations

3.9.2 Technical Specification

3.9.2.1 Design parameters

The steel structures envisaged here shall be designed as per IS: 300-1984 Superimposed loads shall be considered in accordance with IS: 875-1987 in addition to technological loads. Buildings shall be designed for wind loads. Wind load on structures shall be considered as per IS 875-1987. All structural steel work shall be of welded construction.

3.9.2.2 Materials

i) Structural steel

All structural steel shall be of tested quality. Mild steel shall conform to IS: 2062, Gr.A - 1992 for rolled sections and plates up to 20mm thickness or IS: 2062, GRB -1992 for plates and sections above 20mm thickness. Mild steel used in gutters and collector pipes shall conform to IS 2062, GR.A - 1992, copper bearing quality. Medium or high tensile steel shall conform to IS: 8500- 1992. Roof shall be in galvanized corrugated steel sheets 0.80mm thick conforming to IS:272- 1992 and the fasteners shall conform to IS:730 -1978.

The Contractor shall submit the test certificate conforming to appropriate standards of all steel materials used for fabrication. All structural steel shall be free from rust, scales, lamination, cracks, fissures and other surface defects.

ii) Bolts and Nuts

All bolts and nuts conform to IS: 1363 -1992 or IS: 1364 - 1992 as applicable and unless specified otherwise shall be hexagonal. Material for bolts and nuts shall be as per IS: 1367 - 1992. All nuts shall conform to property class compatible to the property class of the bolts used. The contractor shall submit test certificates when called for.

iii) Washers

Plain washers shall be made of mild steel conforming to IS 5369 - 1975 unless otherwise specified. One washer shall be supplied with each bolt and in case of special types of bolts more than one washer as needed for the purpose shall be supplied. Spring washers shall conform to IS 3063 - 1994. An additional double coil helical spring washer conforming to IS: 6755 - 1972 shall be provided for bolts carrying dynamic or fluctuating loads and those in direct tension. Tapered washers conforming to IS: 5372 - 1975 and IS: 5374 - 1975 shall be used for channels and beams receptively.

iv) Welding

The welding and the welded work shall generally conform to IS-816 – 1969 and IS: 9595 - 1980 unless otherwise specified. As much work as possible shall be welded in shops and the layout and sequence of welding shall be so arranged as to eliminate distortion and shrinkage stresses. Electrodes shall conform to IS: 814 - 1991.

v) Painting

All the fabricated and erected structures shall be duly inspected and shall be made defect free. All fabricated structures shall receive two coats of approved make red oxide zinc chromate primer as per IS: 2074 - 1992 and the finishing paint on erected structures shall be a minimum of 2 coats of aluminum paint conforming to IS:2339 - 1963 or synthetic enamel paint conforming to IS:2932 - 1993. Care is to be taken in painting the structures, which are subjected to corrosion and rusting.

vi) Fabrication, Erection, Testing and Commissioning

Fabrication, erection, testing and commissioning of steel structures shall be in accordance with IS: 800- 1984 & IS: 215 -1974.

3.9.3 SAFETY AND ACCESSIBILITY

There shall be adequate provisions for access to and around equipment for operational and maintenance functions. All moving and exposed parts shall be adequately guarded.

Following portable type first aid Fire Extinguishers has been envisaged for the Test Rig.

Type	Capacity	Nos.
Water type Fire Extinguishers conforming to IS: 940 – 1976	9 liters	1
DCP type Fire Extinguishers conforming to IS: 2171 – 1976	10 kg	1
CO ₂ type Fire Extinguishers conforming to IS: 2878 – 1976	6 kg	1

All safety provisions are required under the Indian Factory Act and other statutory regulations shall be fully complied with.

- 3.10** The equipment shall be provided with suitable lifting attachment to facilitate erection and maintenance, wherever necessary.
- 3.11** Tenderer has to submit the list of Makes of different equipment from the Preferred Make list of this document / Preferred Make list of CIMFR along with tender Document. These makes will be considered subject to approval of the Purchaser.

4.0 PERFORMANCE GUARANTEE

- 4.1** System Performance Parameters during performance guarantee test shall be as per approved details, meeting requirements of equipment supplier manual and as agreed with the purchaser. Performance Guarantee Parameters and other terms & condition of P.G. Tests shall be necessarily taken care of.

4.1.1 The Successful Tenderer shall manufacture the items/materials strictly as per the Purchaser's specification and maintain quality and workmanship.

4.1.2 The Tenderer shall guarantee the satisfactory performance of experimental Coal Mine Water Treatment Plant.

4.1.3 The Tenderer shall also furnish the test procedure for performance evaluation as per Schedule.

4.1.4 Experimental Coal Mine Water Treatment Plant installed should be able to efficiently carry out the coal mine water test for different test conditions.

4.1.5 Parameters & other modalities of Performance Guarantee test shall be mutually discussed & decided. The following points will have to be met by the Tenderer :

- 4.2.1** All components and equipment of the supplied Experimental CMWT Plant should operate smoothly.
- 4.2.2** All drives of the supplied system operate smoothly and without abnormal vibrations and unsteadiness.
- 4.2.3** All controls can be conveniently operated from the control desk.
- 4.2.4** All safety provisions and interlocks shall work as envisaged.
- 4.2.5** All signaling and alarms shall function normally.
- 4.2.6** All control equipment; instruments shall function normally in all modes of operation.
- 4.2.7** The complete supplied system shall function normally in all modes of operation.

5.0 SPECIAL INSTRUCTIONS TO TENDERER

- 5.1** The offer shall be submitted in 4 (four) sets complete in all respects as per the "Invitation to Tender".

The following details/information shall be submitted along with the offer:

- i) General description of design consideration and all the assumptions made by the Tenderer.
- ii) Pollution control Board clearance & any other statutory clearance are required for this pilot plant will be taken by the tenderer.
- iii) GA drawing of equipment alongwith complete specifications and details of sub- assemblies indicating overall dimensions, technical parameters etc.
- iv) Catalogues/ brief description of brought items.

- v) Time bar chart of delivery showing break up of time required for engineering, order placement for brought item and their delivery to shop, Assembly, testing, inspection and dispatch.
- vi) Q.A.P. (Quality Assurance Plan)
- vii) List of exclusions, deviations and reference list.
- viii) Weight of each items/equipment.
- ix) Complete motor details like kW rating, CDF, duty class, class of insulation,
- x) make etc.
- xi) List of commissioning spares, testing procedure.
- xii) Preliminary load data.
- xiii) Any other details which may be felt necessary.

- 5.2** All tools & tackles, apparatus, special instruments required for erection, testing, commissioning and establishment of Performance Guarantee Test (PGT) shall be arranged, stored, maintained and guarded by the Successful Tenderer.
- 5.3** All construction equipment such as welding/gas cutting requirements, compressors etc., shall be provided, maintained, manned and guarded by the successful Tenderer.
- 5.4** Until the equipment is handed over to the purchaser, the successful Tenderer shall be soul custodian of all materials, equipment's, assembled at site and will be responsible for loss, theft, damage or destruction. For this purpose the successful Tenderer shall take out a "Contractor Risk Insurance" at his own cost to cover the assets.
- 5.5** The responsibility of making adequate storage and handling facility for issue of material and maintaining them rests with the Successful Tenderer.
- 5.6** Incomplete Tenders are liable to be rejected.
- 5.7** On completion of work, all rubbish debris, temporary supports, enabling structures etc. shall be removed from the site and the site (including storage site) handed over to the purchaser in a tidy manner. All scrap etc. shall be dumped suitably at specified places as directed by the purchaser.

5.8 EXCLUSIONS/DEVIATIONS/REFERANCE LIST

- 5.8.1** Exclusion in the offer, if any, shall be clearly stated under the heading "Exclusions", quoting the respective serial reference number in the tender document.
- 5.8.2** Deviations from the Tender Specifications, if any, shall be clearly stated under the heading "Deviations" quoting the respective serial reference no. in the tender document.
- 5.8.3** The Tenderer shall submit alongwith his tender a statement under his signature the official seal, a list of similar jobs executed in the past five years indicating the name of the purchaser, job title, value of work, order reference, time period of delivery/execution as per the order, actual period of delivery/execution and reasons for any delay. Any tender without this statement may not be considered.

5.9 ERECTION AND COMMISSIONING

5.9.1 The successful Tenderer shall provide all equipment, tools, tackles, consumables materials, labour and supervision for carrying out the following:

- i) Transportation from site storage, unpacking, handling, assembling, bolting, welding and satisfactory installation of all equipment and materials including electrical at proper locations according to the drawing and/or manufacturer's instruction book.
- ii) Aligning, leveling, coupling and securely fixing all equipment and accessories in accordance with the drawings and/or manufacturer's instruction book.
- iii) Conducting in co-ordination with Tenderer, manufacturer's representative, and Purchaser's representative all initial runs, tests and all work required for putting the system alongwith equipment into satisfactory and stable operation.

5.9.2 The successful Tenderer shall be responsible for the proper erection of the system along with all accessories as per recommended procedure of manufacturer and approved drawings. The erection work shall be carried out as per modern engineering practice with the help skilled and experienced workforce. The successful Tenderer shall use his own tools and tackles required and provide sufficient manpower for erection, testing and commissioning of these systems and interconnecting piping.

5.9.3 On completion of erection work, all the systems shall be tested alongwith the associated equipment for proper performance.

5.10 SPARES

5.10.1 The Tenderer shall include in his offer and provide with equipment sufficient quantity of spares required for proper erection and commissioning of the system. The Tenderer shall furnish the list of commissioning spares included in the offer. All unused spares after erection shall be handed over to the purchaser after commissioning of the system at free of cost.

5.11 COMPLETION PERIOD

5.11.1 The Tenderer shall quote the best and earliest completion period of this package. The Tenderer shall submit implementation chart giving total time schedule.

5.11.2 The Project will be executed on TURNKEY basis and the Project must be completed within months from the date of award of LOI.

5.11.3 The Successful Tenderer in consultation with the purchaser shall draw up a detailed time schedule for completion of the various jobs involved.

5.11.4 If, any time the purchaser finds that any particular work is not progressing properly according to the approved detailed program, the purchaser shall have the right to take over the particular work for execution by himself or by any other agency at the risk and cost of the Successful Tenderer, provided such delays are due to the Successful Tenderer.

5.11.5 The purchaser reserves the right to accept/reject the offer in totality or split the scope of supply or alter the specified quality of supply or delete any item from the scope of work without assigning any reason.

5.11.6 The purchaser has the right to split the order and place the order on more than one party.

5.11.7 TECHNICAL CAPACITY OF THE TENDERER

5.11.8 SECERACY AGREEMENT

The drawing and document enclosed remain fully, CIMFR's property and can neither be produced nor communicated to third party in any way, nor utilized any other purpose, without a written consent of the CIMFR.

5.12 Billing and Payment Schedule: As follows:

Billing and Payment Schedule

S.N.	Description of work	Payment schedule		
		Supply	Erection	Final Payment
	Detail Design and Engineering of the system including layout plan.	60% of the quoted value after approval of the design and engineering part.	20% after erection and alignment of work at site.	20% after the completion and successful running of the plant.
	Supply, fabrication and erection of the equipments and components along with all accessories and electrical fitting: Steam Generation System & associated accessories and equipments. Softener, iron filter, feed and reaction vessels, flocculation vessels, clarifier, pressure filter and required pumps, pipes, valves etc. Ozone generation units including required accessories.	60% after receiving and inspection of the material at construction site and work satisfaction on component wise.	20% after the erection, installation and alignment of the components.	20% after the completion and successful running of the plant.
(a)	Construction and related civil works including foundation of the equipments and supporting structures, storage and overhead tanks, stairs etc. Construction of appropriate shed for housing plants and equipments, chemical storage and quality control room as per the layout plan. Electrification and accessories including illumination work at site.	70% after completion of the related work on component wise at work site.	20% after erection and completion of the building and plant at site	10% after the completion and successful running of the plant.
	Testing and commissioning of the entire plants without load.		70% after successful test with no load	30% after successful commissioning and running of the system with full load.
	Final commissioning and running of the plant with full load.			100% after successful commissioning and running of the system with full load.

Note:

1. Minimum billing amount should be Rs. 15 Lakhs except the final payment.
2. 10% of bill value will be deducted from each running bill as performance guarantee cost which may be released after one year from the date of handing over the plant or may be released against bank guarantee which may be valid for one year the date of handover the plant.
3. Taxes and duties etc. may be paid 100% against each bill without any deduction against supply etc.

Annexure-I

MINE WATER RECLAMATION UNIT FOR SAFE DRINKING WATER

List of Equipments, Equipment Names and Specification

Equipment No.	Equipment Name	Specification
MW-01	Mine water storage 2 Units	Rectangular each having capacity 50,000 liter 7MX5MX1.5M material of construction concrete with necessary nozzles, overflow, drain.
MW-02	Flocculation vessel 1 Unit	Vertical, partly cylindrical, partly conical material of construction. Mild steel Diameter 2000mm (IS:2062) Cylindrical height - 2000mm, Conical height -1000mm Top open capacity - 7330 Liter Body thickness 6 mm with reinforcement 4 Nos. baffles inside 4 Nos. lugs for support Driven by 5 H.P motor (rpm 1440) with Gear Box (50:1), V-Belt Drive Final r.p.m.20±20% 2 Nos. stirrer (1) 800 mm Turbine Driving System supported (2) 800 mm Propeller on channels.
MW-03	Water Heating Vessel 1 Unit	Vertical, Cylindrical Diameter 700 mm Height -1900 mm Top closed with open Vent Material of construction mild steel (IS:2062) Capacity 730 Liter Body thickness 5 mm With 3 Nos. steam spargers Sparger diameter 500 mm Insulation with 1" glass wool with thermometer pockets and necessary nozzles.
MW- 04	Reaction/Mixing Vessel 1 Unit	Vertical, partly cylindrical, partly conical material of Construction SS316 Total volume 3000 Liter Diameter 1250 mm Cylindrical height 1750 mm Conical height -500 mm Top open Body thickness 5 mm, No. of Baffles - 4, No. of stirrer blades - 3 on same shaft 1)Turbine type 1 No. 2) Propeller type- 2 No., Drive Motor 5 H.P (1440 rpm) with Gear Box 30:1 with v-Pulley, final r.p.m. 30±20% With steady bearing at bottom Driving system supported on channels with thermo pockets and necessary nozzles.

MW-05	Clarifier Dorr Thickener type 1 Unit	Vertical Cylindrical Material of construction - Mild Steel (IS-2062) Diameter 5500 mm Total Height 2500 mm With rotating rakes (long and short arm blades); slow speed Rotating Speed 2 r.p.m. $\pm 20\%$ Support mechanism for supporting Driving unit with motor, Gear Box. Feed Well and overflow weir throughout periphery With discharge cone.
MW- 06 MW- 08	Water Collector 2 Units	Cylindrical, vertical material of construction - Mild steel (IS-2062) Capacity 6200 Liter. Diameter - 2000 mm Height - 2000 mm, Body thickness 5mm with stiffener. With inlet/outlet nozzles With level indicator.
MW-07	Pressure Filter with Pump 1 Unit	Sparkler type Pressure Filter Vertical Plates Self Cleaning Type Capacity sufficient for passing 5000 liter/hr.
MW-09	Ozoniser - 1 Unit SS-316	Ozoniser/contactor suitable for 4000 Liter/Hour of flowing water with suitable bubbling system (approx. 10gm/hr ozone supply).
MW - 10	Ozone Generator - 1 System	Consisting of 1) Air Preparation e.g. drying, dust and oil separation. 2) Electrical System including transformer 3) Ozone Generator All suitable for 4000 Liter/Hr. of flowing water.
MW-11	Treated Water Receiver 1 Unit	Rectangular, Vertical Material of construction concrete (M20 grade) Capacity 12000 Liter Length - 3000 mm, width 2000 mm, Height - 2000 mm. With inlet, outlet and overflow nozzles, Manhole and drain. With level indicator and level alarm.
MW-12	Overhead Water Storage 1 Unit	Concrete Water Storage Capacity 50,000 liter with water inlet and outlet and vent (M20 grade). With level indication and level alarm switch. With Mild Steel Staircase Height - 18 meter
CA- 01 & CA- 02	Alol Preparation Vessel & Feol Preparation Vessel 2 Units	Vertical, cylindrical with dished bottom and flanged dished top. Capacity 500 kg/batch Material of construction SS316 with heating and cooling jacket of mild steel (IS2062). Diameter - 800mm Cylindrical height - 1200mm Body thickness 5mm Jacket body thickness 6mm with helical reinforcing stiffener stirring system with 2 Nos. Turbine Blades Stirrer rod 60 mm dia with flexible coupling, bearing housing, steady bearing

		<p>Driving system with 5 HP Motor (1440 rpm) Gear Box 10:1 with V-pulley Final speed 150 r.p.m. $\pm 20\%$ With 2 nos. baffles Manhole and necessary nozzles 4 Nos. lungs.</p>
CA- 03 CA- 04	Alol collection Vessel and Feol Collection Vessel 2 Units	<p>Vertical ,cylindrical mounted on trolley, Capacity 600 ltr. MOC SS316; Body thickness 3mm open top</p>
CA- 05	Flocculent Solution Vessel 1 Unit	<p>Vertical Cylinder material of construction SS 304 Capacity 600 Liter Top open Body Thickness 4mm Stirred rod 50mm dia Diameter 800 mm Height 1200 mm With propeller type stirrers Driven by 3 h.p. motor (1440 rpm), Gear Box 20:1 with pulley, Flexible coupling and Bearing housing; R.P.M. $70\pm 20\%$ with 2 Nos. baffles and 4 lugs with necessary nozzles. With level indicator.</p>
CA- 06	Flocculent Collection Vessel 1Unit	<p>Vertical Cylindrical, mounted on trolley Capacity 600 Liter MOC -SS 304 Body Thickness 3mm Open Top</p>
CA- 07 CA- 08	Alol/ Feol Feed Vessel 2 Units	<p>Vertical Cylindrical, Material of construction SS316, Capacity 260 Liter Top open Diameter 650 mm, Height - 800 mm Body Thickness 3 mm with stiffener With loose cover, with level indicator and necessary nozzles and 2 No. lugs</p>
CA- 09	Flocculants Feed Vessel 1Unit	<p>Vertical Cylindrical, Material of construction SS304. Capacity- 600 liter. Top open with loose cover Diameter 800mm, Height 1200mm Body thickness 4mm With level indicator and necessary nozzles, 2 nos. lugs</p>
CA- 10	Sodium Carbonate Solution/Feed Vessel 1Unit	<p>Vertical Cylindrical Material of construction SS304 Capacity - 600 liters, Diameter 800mm, Height- 1200mm,Body thickness 5 mm with propeller Stirrer Drive 2.h.p.motor (1440 rpm) Gear. Box 20:1 with pulley, Speed 70 r.p.m. $\pm 20\%$ With flexible coupling and bearing housing, Top open; Drive system mounting on channels With level indictor 2 Nos. baffles and 2 lungs and necessary nozzles.</p>

STEAM BOILER UNIT – COAL FIRED

1. Coal fired Boiler : Capacity 150 Kg. per Hour
Low pressure (2-3 kg/cm²)
2. Process Water Tank : HDPE Tank 15000 Liter.
3. Iron Filter For :
4. Water Softener :
5. Soft Water Tank : HDPE Tank 15000 Liter.

PUMPS

	Nos.
P-1 Coal mine water to flocculation vessel centrifugal pump. Cast Steel Capacity 4000 liter/hour – 3 M Head Pump type- Centrifugal non clogging	2
P-2 Flocculation vessel to water heater centrifugal Pump. Cast steel Capacity 4000 liter/hour – 6 M head.	1
P-3 Water collector I to pressure Filter Centrifugal Pump Cast Steel Capacity 4000 liter/hour – 15 M Head	1
P-4 Water collector – II to Ozoniser - Centrifugal pump, Cast Steel, Capacity 4000 liter/hour – 5 M Head	1
P-5 Treated water collector to overhead storage- Centrifugal pump Cast Steel, Capacity 6000 liter/hour – 20M Head.	1
P-6 Portable Barrel Pump- Stainless steel (SS316) Capacity 800 liter/hour – 5M Head	3
P-7 Soft water to soft water storage- Centrifugal Pump, Cast Steel, Capacity 4000 liter/hour – 3M Head	1
P-8 Boiler Feed Pump (Part of Boiler Supply)	1
P-9 Flocculater sludge discharge pump- Diaphragm Type	1
P-10 Clarifier Sludge Discharge Pump- Diaphragm Type	1
P-11 Metering/Dosing Pump for addition of chemicals- Stainless Steel Plunger Pump	1

INSTRUMENTS

1. pH meter/indicator
2. On Line pH meter and controller
3. Temperature meter /Indicator
4. Online temperature indicator and controller including steam flow control valve.
5. Water Flow Meter 2 Nos
6. Level Indicator/Limit Switch/ Level Controller 4 Nos.
Instrumental Panel for above.

PIPELINE AND VALVES

For the main steam 75mm to 100mm pipeline of mild steel is required.

Pipelines are connected through flange joint.

For chemicals and additives stainless valves used are mostly

1. Glove Valve
2. Ball Valve
3. Diaphragm Valve

Pump with the capacity to pump 10,000 liter/Hr - 40m Head with valve and piping for about 500 meter will require for connecting the mine water discharge point to the water treatment plant site and it should also be included in the offer.

Necessary power for running the plant shall be available. Vendor may make estimate of requirement. Electrification and erection of an appropriate shed for housing the plants and equipments as per the layout should also be worked out and included in the offer.

Note: Equipments specification as given in equipment list is governing and any deviation from it should be clearly mentioned in the offer.

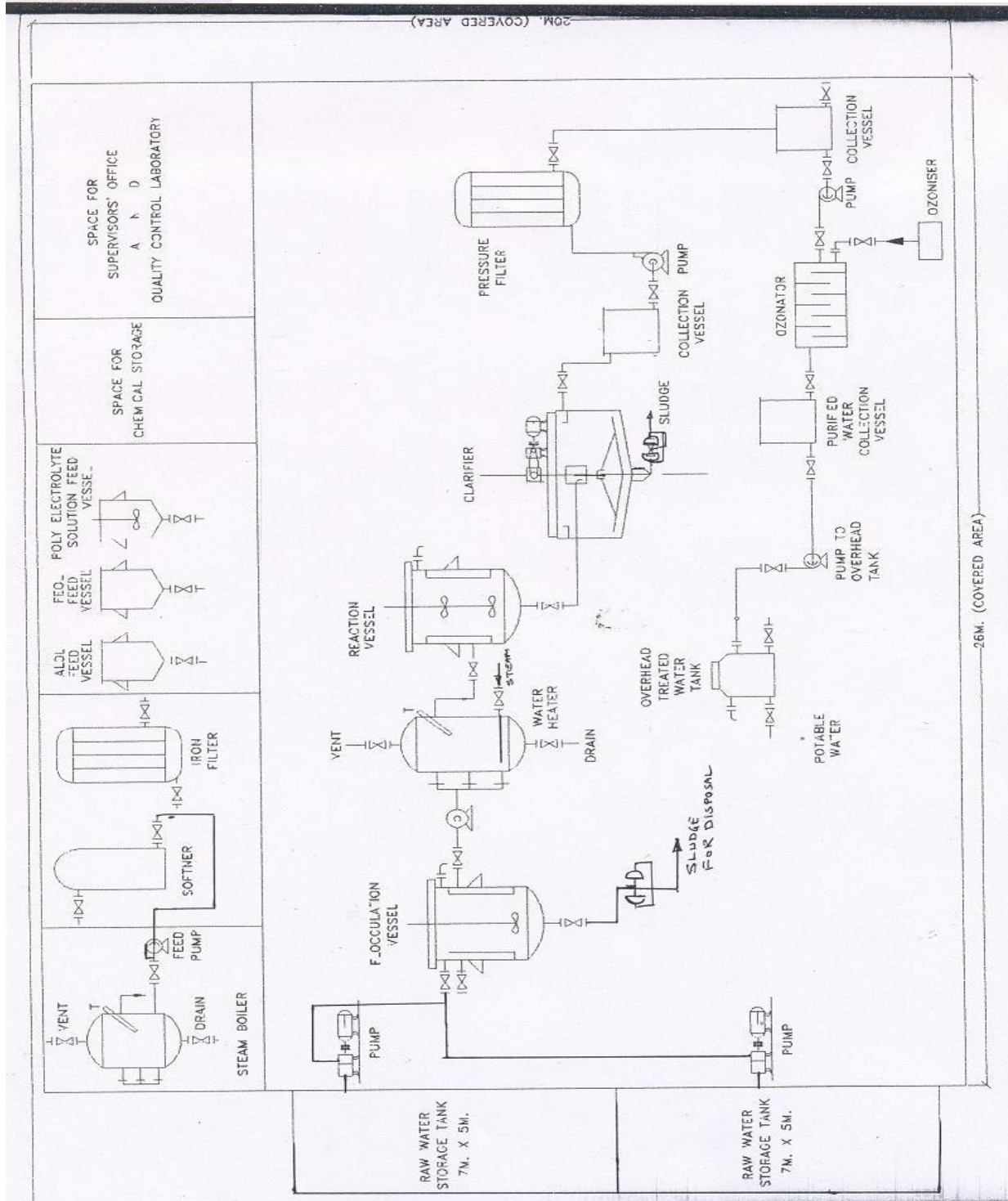
Some Important Points

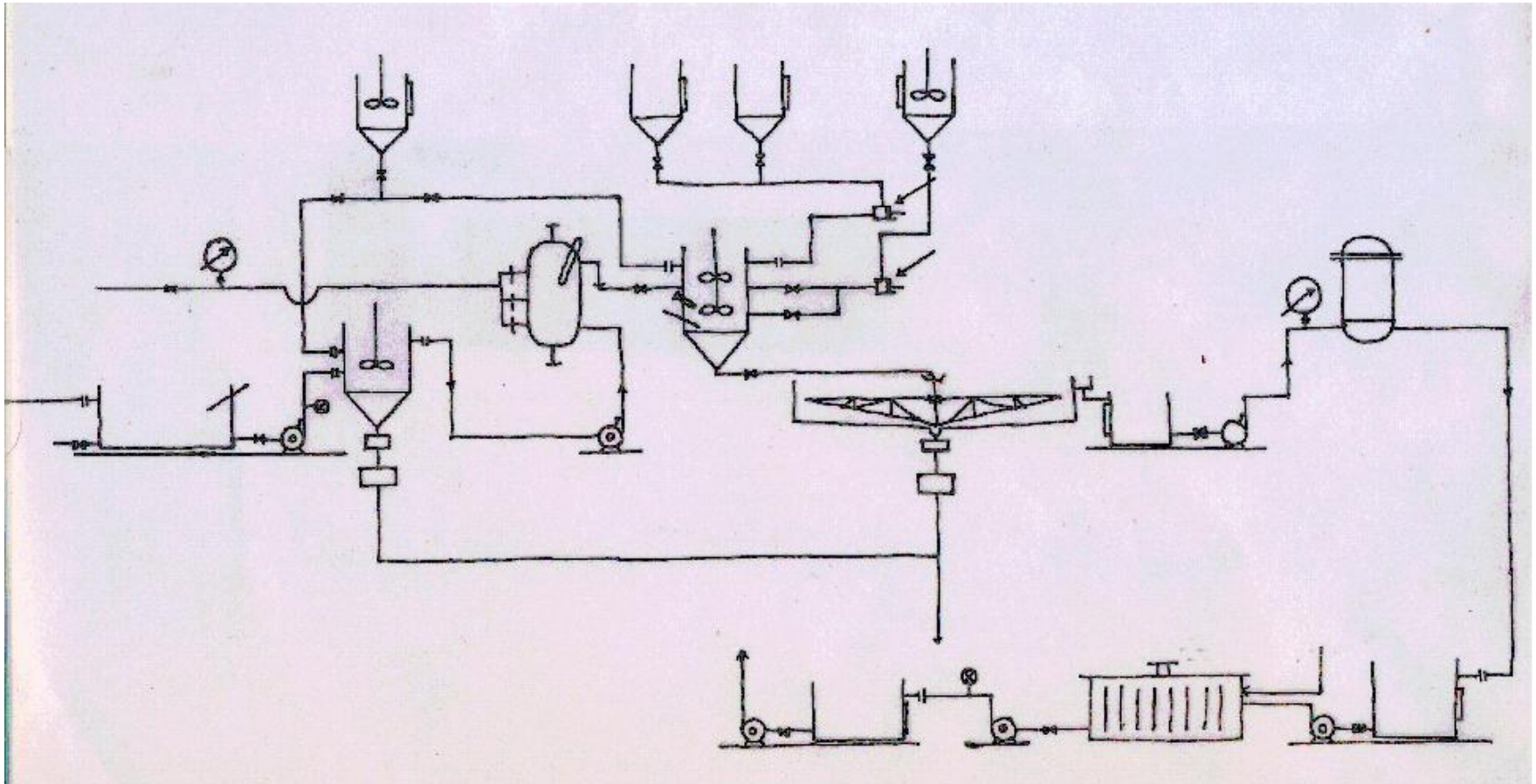
In addition to above, the following points should be taken into account and must be technically addressed in the submitted bid:

1. The feed water for the water treatment plant is to be transported from the Aralgaria mine water discharge site by providing RCC sump of 15 kl capacity by 2 (two) pumps (one running and one standby) of capacity of 15 kl/hr with 30 m head. This water has to be transported by HDPE pipe (100 mm NB) to the water treatment plant site about 300m away. The pipe lining from mine water discharge site to the treatment plant site should be laid as per prevailing standards.
2. All flow meter should indicate both flow rate and total flow.
3. All submerged parts of the vessels to be made of SS-316 should also be of the same material (SS-316).
4. Float type level indicators with A/V alarms must be provided with MW-02 & MW-04.
5. Nominal rotating speed of clarifier (MW-05) rake should be 0.5 rpm. In addition, vary-pulley should be provided.
6. MW-06, MW-08 (water collector) & MW-11 (treated water receiver) should be provided with float type level indicator-cum-controllers with A/V alarms to control operation of P-3, P-4 and P-5 pumps respectively.
7. Temperature indicator-cum-controller should be provided to control water temperature at water heating vessels (MW-03).
8. Temperature indicator should be placed locally for CA-01 & CA-02.
9. Online pH meter with indicator and controller should be provided at MW-03 to control sodium carbonate dosing pump. Preferred make of pH meter is Eutech/Forbes/Orion.
10. Flocculator sludge discharge pump (P-9) and clarifier sludge discharge pump (P-10) should be diaphragm type made of SS-304. The nominal capacity of 200 liter/Hr with suitable head for discharging the sludge at 30 m distance.
11. 2 (two) numbers of metering and dosing plunger pump (P-11) with capacity of 2-10 liter/Hr should be provided for addition of chemicals.
12. Pipe line and Valves: Material of construction (MOC) and size of pipe line should be as follows:
 - (i) Pipeline from the collecting site to the treatment plant sites should be of HDPE, 100mm NB.
 - (ii) All gravity flow pipeline of the mainstream should be of MS-ERW flanged pipe line of 75mm NB.
 - (iii) The pipeline from pump P-4 to MW-11 should be of SS-316 of size suitable to the pump delivery.
13. All above ground RCC tank should be constructed with minimum 200 mm wall thickness and the cover thickness should not be less than 150 mm. Asphalt lining inside the RCC tanks is not needed.
14. All motor protection should comply with IP-55 standard and motor control centre (MCC) should comply with IP-52. Minimum sheet thickness of all control panels should be 16 BG at the front, and 18 BG in other parts.
15. All electrical cabling/wiring should be housed through MS conduits as applicable.
16. Two earth pits are envisaged. Adequate lightning arresters should be provided at the overhead tank and the plant shade.

17. MW-09 ozoniser is indicated to be of turbine type ozone contactor. However, the supporting literature and scheme should be provided about the ozoniser. For removal of moisture from intake air for ozonator, auto-generative desiccant type system should be used.
18. The size and other details regarding plant shade are indicative. The height of peripheral masonry wall will be around 1.5 m. Rest will be covered with MS grills/louvers.
19. Quality control cum office room shall be of glass and aluminium with flat roof, anti-skid floor, granite top working platforms and suitable tiled skirt above working platforms.
20. Boiler house with its all accessories and storage of coal should be housed outside the plant shade. Scheme of the boiler system is hereby enclosed for reference.
21. Piping and valves should be provided with adequate bypasses to meet the process requirement.
22. All buildings and technological structures are to be painted by two coats of primer with enamel paint of approved make and shade. All MS equipment and pipelines should be painted with primer and enamel paint on outside. Inside of MS vessels should be painted with food grade epoxy paint after proper surface preparation (sand blasting).
23. The payment and billing schedule should be furnished under the heads indicated in NIT. No item-wise quantity/rate will be entertained.
24. Successful bidder will have to provide 2 (two) years warranty after the date of the commissioning and handover as indicated in NIT.
25. List of operational and commissioning spares and consumables should be provided as indicated in NIT. However, the costs of these items will not be taken into consideration for the financial evaluation of bids.
26. Supply of all erection and commissioning consumables are in the scope of the bidder. Process consumables will be provided by the purchaser.
27. The successful bidder should arrange for the temporary storage and security of the material at the site at their own cost. The space will be provided to them. No free issued item is envisaged in the scope of the purchaser.
28. Electric supply point for the treatment plant will be supplied within 50 meter from the plant site. During construction/erection/commissioning, the successful bidder should bear the cost for electricity at the prevailing rate. Current rate of electricity is Rs. 4.25/unit.

Layout Plan for Mine Water Treatment Plant





Sl.No.02

Technical Specifications for Coal-to-Liquid Process Development Unit (PDU)

Pre-bid conference at site: 17.08.2010 and 18.08.2010 at 11 A.M onwards.

Coal-to-Liquid Process Development Unit (hence forward termed as CTL-PDU) is an integrated research/testing facility of catalysts and coals for conversion of coal to liquid hydrocarbons. The basic process includes gasification of coal by steam and air at atmospheric pressure and simultaneous conversion of the mixed gas to gaseous and liquid hydrocarbons in presence of catalyst at elevated pressure (20 – 30 kg/cm²) and temperature (180 – 320°C).

The whole CTL-PDU consists of:

- i) Coal Gasifier,
- ii) Cold Gas Clean-up System,
- iii) Shift Reactor Assembly
- iv) CO₂ Scrubber
- v) Booster Blower
- vi) Low Pressure Floating Head Gas Holder
- vii) High Pressure Syngas Compressor
- viii) High Pressure Buffer Tank
- ix) Pre-heater
- x) Additional Guard Bed for removal of Sulfur
- xi) Multi-tubular Fixed Bed Reactor with suitable Heat Exchanger
- xii) Catch pots (2 nos)
- xiii) Gas Flowmeter/Totalizer
- xiv) On-line Gas Analyzers (GC, IR Based and FT-IR based)
- xv) Bench Top Catalyst Testing Unit
- xvi) Flare Stack
- xvii) Housing of the Plant
- xviii) Essential Utilities

The total CTL-PDU should be PLC controlled. Details of operation and utility of each component are described below (**Schematic Flow Sheet in Fig: 1**)

- i) **Coal Gasifier (One):** It is a unit used for gasification of high ash (30- 50%) coals for generation of mixed gas in a continuous manner. Gasification will be done with the help of steam and air in fixed bed condition under atmospheric pressure and temperature of ~ 1100°C. Up to 100 kg/h coal may be charged in the gasifier to produce mixed gas of

approximate composition of CO: 16 – 20%; H₂: 16 – 20%; N₂: 50 – 55%; CO₂: 8 - 10%; CH₄: 2%. This mixture will also contain impurities in the form of solid/liquid/gases like solid particulate matter (SPM), soot, coal tar, H₂S, NH₃, HCN, COS, HCl, etc.

The gasifier should include a suitably rated steam generator and blower for air feeding. There should be suitable flow meter and control valves to control air flow rate and steam flow rate. There should be provision for ash extraction at the bottom of the gasifier. Provision for suitable raw coal crushing, handling and suitable mechanized coal feeding system like bucket elevator etc for coal charging in the hopper of the gasifier should be made. Level indicator for maximum and minimum level of coal in the hopper should be provided. Coal charging in the gasifier should be PLC controlled. There will be separate thermocouples for reading syngas temperature at the gasifier out-let. Safety devices like pressure relief valve and rupture discs should be provided. Suitable material of construction and lining should be provided as per processes requirement. Care should be taken in the PLC programming in the form of audible alarm for sudden temperature rise. A sampling line would be provided to the Gas Analyzer for time to time monitoring the composition of the product gas of the gasifier. A sampling port along with sampling probe should also be provided for manual collection of gas. A vent line would be provided and be connected to the flare stack so that gas stream could be vented during initial start-up of the Gasifier.

ii) **Cold Gas Clean-up System:** The product gas (~200 Nm³/h) from the gasifier be cooled down in the Gas Clean-up system ~ 70°C. The gas cleaning system can be divided as follows:

1. Removal of particles or dust collection through cyclone separator
2. Condensation and separation of tar from the product gas using water cooled condenser
3. Removal of water soluble gases HCl and NH₃ using water scrubber
4. Alkali scrubbing system for removal of acidic gases like COS, HCN
5. Mist eliminator/knock out drum for de-misting the product gas

There will be separate thermocouples for reading the temperature at the each out-let of the aforesaid gas cleaning devices.

The gas is cleaned of sulfur compounds and other unwanted components to extremely low levels, to protect the downstream catalysts. Water stripping removes ammonia produced from any nitrogen in the coal. Sulfur in the coal is converted to hydrogen sulfide (H₂S) and carbonyl sulfide (COS). Hydrolysis is used to convert COS in the syngas to H₂S, which is recovered in the acid-gas removal step.

A flow-meter/totalizer (Capacity: 200 Nm³/h) should be provided to quantify the total amount of gas produced during gasification. A sampling line would be provided to the Gas Analyzer for time to time monitoring the composition of the product gas of the gasifier. A sampling port along with sampling probe should also be provided for manual collection of gas.

The cleaned gas will be divided into two streams, one is to be connected to the Shift Reactor System and other is connected to the out-let of the Shift Reactor. The ratio of the two stream of gas would be ~ 1:2 and suitably rated flow meter and control valves would be provided to both the lines to maintain the gas flow.

- iii) **Shift Reactor Assembly:** It is an ancillary reactor system, which is used to increase the H₂/CO ratio. This reactor system will consist of four components namely: a) Pre-heater, b) High Temperature Shift (HTS) Reactor (300°C), c) Cooling system to cool the gas from out-let of HTS to 200°C, (d) Low Temperature Shift (LTS) Reactor (200°C). Commercial Shift Catalysts will be used for this purpose. HTS and the LTS are actually two adiabatic reactor beds connected by a cooling system to bring down the in-let temperature of the LTS to below 200°C. The maximum temperature of the HTS can go up to 300°C. HTS, LTS and the cooling system should have independent temperature controller and probes which will be able to control temperature through PLC. Heating should be provided with the help thermic fluid heat exchanger. There will be separate thermocouples for reading the temperature inside the pre-heater, HTS, LTS and intermediate and final cooling out-let. The gas should be fed top to bottom and with reference to the Gasifier capacity, nearly ~ 70 Nm³/h of mixed gas will pass through it. It should also include a suitably rated steam generator (Steam Feed Rate: ~ 20 L of water/h) which will inject steam into the reactor required for the Shift Reaction ($\text{CO} + \text{H}_2\text{O} \rightleftharpoons \text{H}_2 + \text{CO}_2$). Provision should be there to measure and control steam flow rate which will be introduced into HTS. Both the HTS and LTS are to be heated and both in-let and out let temperature for each bed to be monitored and controlled through PLC and the temperature should not go beyond 500°C and 300°C respectively (These are deactivation temperatures for HTS and LTS catalysts). Capacity of the Shift reactor assembly would approximately of 10 L. A sampling line would be provided to the Gas Analyzer for time to time monitoring the composition of the product gas from the Shift Reactor. A sampling port along with sampling probe should also be provided for manual collection of gas. A flow-meter/totalizer (Capacity: ~ 100 Nm³/h) should be provided to quantify the total amount of gas produced during shift conversion. Suitable MOC should be selected as per process requirement. Cooling arrangement should

be provided to bring down the temperature of the gas produced from Shift reactor to normal temperature.

- iv) **CO₂ Scrubber:** After the shift reaction the syngas will be richer in CO₂ and needs to scrub 50 Nm³/h of CO₂ out of total 220 Nm³/h of gas. Standard scrubbing procedure may be followed like using DOW solvents like UCARSOL AP 814 solvent for total CO₂ removal (<15 ppm) or UCARSOL CR 402 solvent for total CO₂ and H₂S removal or SELEXOL solvents. The suitable regeneration and recycle system for the solvents should be included. There will be separate thermocouples for reading the temperature of the out-let gas. A sampling line would be provided to the Gas Analyzer for time to time monitoring the composition of the product gas from the scrubber. A sampling port along with sampling probe should also be provided for manual collection of gas. A flow-meter/totalizer (Capacity: ~ 200 Nm³/h) should be provided to quantify the total amount of gas available after CO₂ scrubber. Suitable MOC should be selected as per process requirement.
- v) **Booster Blower:** Suitable booster blower should be provided to suck the clean gas from the Gasification Island and fill in to the Gas Holder along with pressure control valves/mechanism to keep the pressure stable in the Gasification Island. This system should be regulated through PLC,
- vi) **Low Pressure Floating Head Gas Holder (One):** The syngas thus produced contains CO, H₂, N₂ and CH₄ (minor) will be stored in storage tanks. The capacity of the storage tank would be 30 Nm³ with all safety arrangements. Suitable MOC should be selected as per the norms for storing of inflammable gases. There should be thermocouples for reading the temperature of the stored syngas at least at two points of the Gas Holder.
- vii) **High Pressure Syngas Compressor (One):** Fischer-Tropsch reaction is a High pressure reaction, hence the syngas pressure is to go up to ~ 30 kg/cm². The compressor should be such that it can build up to 30 kg/cm² of pressure in Multi tubular reactor and its capacity should be of ~ 10 Nm³/h. The manufacturer of compressor should be of international repute. The ON/OFF operation of the compressor should be controlled in order to maintain stable syngas pressure in the Buffer Tank (Described next: viii). All international safety precautions (e.g. High pressure/temperature cut-off, safety relief valve, out-let of the safety relief valve to be connected to flare stack etc.) for high pressure syngas handling should be ensured.
- viii) **High Pressure Buffer Tank:** Syngas compressed by the High Pressure Compressor will temporarily be stored in a High Pressure Buffer Tank (Capacity of: ~ 1 M³) and simultaneously feed into the FT Reactor. The Gas Flow rate (up to 10 Nm³/h) can be

varied according to the requirement of the FT reaction. The High pressure buffer tank should be made of suitable quality material and thickness conforming to the standards of high pressure gas storage vessels. A flow-meter and control valve should be provided to quantify the total amount of gas to be fed in to the Pre-heater vis-à-vis Reactor.

Capacity or selection of Syngas compressor and high pressure storage should be such that any fluctuations in the process pressure have to be sustained.

- ix) **Pre-heater:** The cold gas is not directly fed in to the FT Reactor hence the feed gas is pre-heated to a temperature $\sim 20^{\circ}\text{C}$ less than the FT reaction temperature. Suitable heating arrangement by using thermic fluid should be provided to keep the temperature of pre-heater in the range of $150 - 300^{\circ}\text{C}$. There will be separate thermocouples for reading the temperature inside the pre-heater. The pre-heater should be provided with circular coils or filled up with inert materials for temperature homogenization of the feed gas. Additional CO/H_2 feed line with flow meter and flow control valves should be provided.
- x) **Additional Guard Bed (Capacity: 5L):** FT Catalyst is very much susceptible to sulfur poisoning, hence an additional Catalyst Bed will be attached to the on-line stream to bring down the S to minimal (<2 ppb S). The temperature of the Guard Bed should be in the range of $150 - 300^{\circ}\text{C}$ by suitable thermic fluid heat exchanger. Thermocouple should be provided at the out-let of the Guard Bed. It will be a Fixed Bed Reactor where commercial desulphurization catalyst will be used to remove any trace of sulfur from the feed gas.
- xi) **A) Multi-tubular Fixed Bed Reactor:** This is the main Fischer-Tropsch reactor system. It is multi-tubular Fixed Bed Reactor of 10 L catalyst capacity. The temperature of the reactor can go up to 400°C through thermic fluid heat exchanger and operating pressure of $30 \text{ kg}/\text{cm}^2$. The length of the reactor would be 2.3 M and it can hold 6 – 7 smaller tubes. These tubes (ID of each tube: 30 mm) should be jacketed and suitable heating and cooling system should be arranged to maintain the temperature of the reactor as exothermic heat produced is $\sim 4000 \text{ kcal}/\text{h}$ during the FT reaction. Another additional set of tubes should be provided which will consist of 10 tubes of ID 20 mm and length 2.3 M. The feed gas should enter from the top and product out is from the bottom of the reactor. Vendor should make proper design of flow distribution so as to ensure the equal reaction conditions in all tubes. The temperature of the reactor should be monitored at least at 3 to 4 zones (top, 2-mid zones and bottom) of all around the reactor and suitable temperature controller system should be given to maintain the reactor temperature at certain reaction temperature ($\pm 2^{\circ}\text{C}$). The reaction temperatures may be varied from 200 to 320°C at an interval of 10°C and control of temperature should be such that temperature fluctuation should not be more than

$\pm 2^{\circ}\text{C}$. Suitable arrangement should be made for loading of the catalyst from the top and used catalyst discharge from the bottom of the reactor. All international safety precautions (e.g. High pressure/temperature cut-off, safety relief valve, rupture discs, out-let of the safety relief valve to be connected to flare stack etc.) should be ensured for this reactor. The out-let of the reactor is connected to the Hot Catch Pot through a product transfer line which is maintained at a temperature of $110 - 120^{\circ}\text{C}$ for collection of the liquid and solid products of the reaction.

B) Heat Exchanger: The exothermic heat of reaction generated with in the **Multi-tubular Fixed Bed Reactor** is removed by circulating thermic fluid in the shell side of the reactor to maintain near iso-thermal conditions of the catalyst beds. The thermic fluid is circulated through the reactor shell by a circulating pump. A heat exchanger with cooling is provided in the circulation line to take away the heat of reaction which is picked up by thermic fluid from the reactor. Electric heaters are to be provided in the line (heat tracing) and also within the thermic storage tank to heat-up the reactor during start up and whenever required. The Heat Exchanger should be provided with suitably rated all necessary components including Thermic Fluid (TF), TF Heater, TF Pumps, Cooling Tower, Water Cooler, Air Cooler (Radiator), TF Evapansion/Refilling Tank etc. During reaction time, the exothermic heat will be transferred to the thermic fluid which will be carried to the heat exchanger where heat will be transferred to the cooling tower.

xii) Catch Pots: Catch pots are the containers connected at the end of the product transfer line. The product transfer line should be equipped with heating arrangement ($120 - 150^{\circ}\text{C}$). There will be two catch pots and they will be maintained at different temperatures to arrest different hydrocarbon products. Isolation collection pots will be provided at the bottom of each catch pots having capacity 5 L each. Isolation valves should be provided in between catch pot and the collection pots. Liquid level gauge in the catch pot and the collection pot should be provided. Heat tracing arrangement should be provided in the Catch pot and collection pots for de-waxing purpose.

a) Hot Catch Pot (01 No.): The temperature of this pot will be maintained from $40 - 110^{\circ}\text{C}$.

b) Cold Catch Pot (01 No): The cold catch pot will be maintained at temperature ranging from $- 20$ to 40°C . Uncondensed gases in the cold catch pot will be taken to vent through the Back Pressure Control Valve and Gas Flow Meter. Suitable rated Back Pressure Control Valve should be provided to maintain the Reactor Pressure.

- xiii) Gas Flow Meter/Totalizer:** It will record total gas out-put (un-reacted + gaseous hydrocarbon products) from the Fischer-Tropsch Multi-tubular Fixed bed Reactor. The maximum flow will be $\sim 10 \text{ Nm}^3/\text{h}$.
- xiv) On-line Gas Analyzers:** 1 (one) NDIR based on-line gas Analyzer (Gasboard 3100, Wuhan Cubic Optoelectronics Co Ltd.), GC (01 No; Equipped with both TCD & FID) and FT-IR based Gas Analyzer (50 gases together, Make: GASMET, Model: Cx-4015) for quick and easy on-line gas analyses. All necessary arrangements should be made for gas transfer lines following the principles of the individual Gas Analyzers (Details is provided in equipment List). Required carrier gas cylinders together with suitably rated double stage gas regulators (Gas Manifold) should be provided for the Gas analyzers in the Pilot Plant.
- xv) Bench Top Catalyst Testing Unit:** It is a complete reaction system designed for catalyst evaluation in small quantity. The standard system includes one fixed bed tubular reactor with system control accomplished by a PLC and a supervisory computer. The reactant preparation portion is capable of handling up to four inputs. Two inputs can be high pressure liquid pumps. The reactants are passed through an optional mixer/vaporizer assembly for blending and creating a single homogeneous, non-pulsating stream to be fed to the reactor. This system allows for accurate and automatic control of feed valves, status valve, sample valve, reactor temperature and pressure. Mass Flow Controllers for automated delivery of reactants and a heated transfer line to a Gas Chromatograph port. Reactor Temperature: $\geq 500^\circ\text{C}$, System Pressure: $\geq 50 \text{ bar}$, Reactor size: 10 mL, Oven Temperature: $\geq 200^\circ \text{C}$, Components located in Oven: mixer/vaporizer, reactor, sample valve, status valve, back pressure regulator body, pressure transducer isolator. Feed Lines: 1/8" bulkhead, 7 micron filter, metering valve, 3-way valve for vent or online porting, and reverse flow check valve. Compression fittings for stainless steel tubing with 1/8" OD and 1/16" ID.
- xvi) Flare Stack:** This should be provided with LPG (5 nos of commercial LPG cylinders should be provided) supported pilot burner with flame sensor which will be operated through its control panel/PLC for flaring of the exhaust gas from the FT Reactor, Gasifier and various vent lines etc with all safety arrangements.
- xvii) Housing of the Plant:** Housing of the plant to be provided by the Vendor. Other than the Low Pressure Gas Holder, the entire Pilot Plant should be housed under single roof with half man wall boundary. Roof should be of galvanized corrugated steel sheets conforming to IS 227 and fasteners shall conform to IS 730. All fabricated structure shall receive two coats approved make red oxide zinc chromate primer as per IS 2074 and the finishing paint on erected structures shall be a minimum of two coats of aluminum paint conforming to IS 2339 or synthetic enamel paint conforming to IS 2932. Adequate numbers of entrance and exits should

be provided for the plant area. The total area would be calculated in such a way that sufficient moving space is there considering the convenience of operation of the plant/equipment, safety, maintenance etc. The Control Panel and other necessary sensitive Equipments (viz.: GC, FT-IR based Gas Analyzer, IR based Gas Analyzer, Bench Top Catalyst Testing Unit, etc.) should be housed in a room (within the Plant Area) provided with adequate Air-conditioning (Two Split ACs of 2 Ton Capacity each) arrangements. The room would be of sufficient size that at least 10 persons can work simultaneously. Adequate numbers of tables (for keeping the computers and instruments) and chairs (sitting for ten persons) should be provided. Double Glass pane window (W: 4 M, H: 2 M) should be provided toward the Plant side. The plant area should be adequately illuminated with flame proof lights. All the electric motors, junction boxes and fittings of the plant area should be flame proof. Structural steel, reinforcement steel and cement should be of tested quality. Other construction materials like bricks, sand, stone chips, paints, fasteners should be of standard quality and strength. All equipment, structure, pipe lines etc shall be painted with adequate numbers of coatings as per relevant BIS/ISO standards.

xviii) Essential Utilities:

- a) **High Pressure Gas Manifold:** Separate line to be provided from High Pressure Gas Manifold to the Shift Reactor Assembly, Additional Guard Bed and Multi-tubular Fixed Bed Reactor. Hydrogen cylinders (15 Nos., Capacity: 47 L water Capacity, Pressure: 130-150 kg/cm²) are to be provided in the High Pressure Gas Manifold which should be equipped with suitably rated necessary delivery system including Strainer Filter, Flow meters and flow control Valves, PRV, Pressure Gauges etc.
- b) **Gas Sample Header** along with sample collection facilities should be provided to collect and feed the samples to the individual analyzers. This should also include purging, flushing and evacuation facilities to facilitate de-contamination. This facility should be controlled by PLC.
- c) **Water Storage Tanks:** Water storage tanks of suitable size should be provided at each required places.
- d) **DM Water Plant:** DM Water Plant of suitable size for steam generation, process requirement etc should be provided.
- e) Suitable system for cold drinking water may be provided in the Plant Area
- f) **Control Panel**
 - Local display for the Temperature, pressure, Differential pressure and flow instruments should be provided at each location for redundancy.
 - ON/OFF Switches to execute the sequential operations of coal feeding and ash extraction activities manually (apart from PLC).
 - Speed controllers and drives for the control of various motors as per requirement

- Indicators for the “Position” of control valves & solenoid valves and actuator operated on/off valves
- Push button switches for power etc.
- Emergency switches and suitable safety devices should be provided for control and instrumentation.
- **Programmable Logic Control (PLC) and Data Acquisition System:** PLC cabinet should be mounted in control room and should be provided with at least 20% extra I/Os.

Two HMI (Human Machine Interface) touch screen control stations should be provided in the Plant. One control station 28” monitor size should be provided in the Control Room. Apart from this, two mobile control stations with wireless connectivity should be provided. Audible and visible alarm system should be provided for PLC. The PLC should be of reputed make like Allen Brady/Siemens. The sophisticated instruments like GC, FT-IR based Gas Analyzer should have there independent data acquisition system. All temperatures, flow rates, pressures, differential pressures, levels and on /off position signals from the valves can be made available to the PLC system, through serial data communication. Suitable hardware and software should be provided. Minimum of 20 KVA (3 Φ) on-line UPS of reputed make (Tata Libert, APLAB) should be provided with one hour back up time for running the control panel and sophisticated instruments.

- Energy meter with digital display and totalizer should be provided for the entire Plant
- The minimum configuration of each of the computer is as follows:**
 Reputed Make (DELL/Compaq/HP/IBM); Intel® Core™ i3-530 Processor (3.2 GHz or higher, 1333MHz FSB, 4MB Cache), **Operating System:** Genuine Windows(R) 7 Home Basic 64 bit Edition (English); **Memory:** 4GB (2X2GB) DDR3 SDRAM 1066MHz Memory, **Hard Drive:** 500GB SATA 3.0Gb/s Hard Drive with Native Command Queuing; **Monitor:** 20” Widescreen Flat Panel Monitor, **Video Card:** NVIDIA(R) GeForce(R) G310 512MB, **Optical Drive:** 16X DVD+/-RW with Dual Layer Write Capability; Multimedia Computer Speaker,
- Laser printers (Make: HP Color: 01 and Black & White: 02) with latest configuration should be provided

Safety, Accessibility and Health hazards

There shall be adequate provisions for access to and around equipment for operational and maintenance functions. High pressure safety valves should be provided at each point where the system is at high pressure. All moving and exposed parts shall be adequately guarded. The consideration for fire hazard and health hazard should be taken care of by the supplier. For safety, DCP, CO₂, foam extinguishers & sand buckets should be placed for electrical,

explosion prone area etc. At least eight fire extinguishers of each type of approved make should be provided. All equipment and components should conform to the standard safety regulations. Also, CO and smoke (10 each) detectors with proper audible and visible alarm system should be provided. Local two-way address/communication system in the Plant Area and Control Room should be provided. Fire fighting system consisting of pump and hose should be provided. Rubber mats, shock treatment charts to be provided at all places like MCC rooms, control room etc. Grounded neutral shall be adopted for the purpose of the proposed plant. The earthing system should conform to IS 3043 and will be in accordance with IE rules. Frame of every motor and other electrical apparatus used for high, medium as well as low voltage accessories shall be earthed by two distinct and independent conductors (in addition to cable armouring where there are cable connections). Proposed plant building shall be provided with lightning arresters with independent earthing pits and grid as IS norms.

It should be noted that the PDU generates various gases, which are detrimental to operator's safety. It is therefore proposed that CO monitor and smoke detectors should be placed at strategic places, which can be identified together with CIMFR scientists.

Special Instructions to Vendors

- ◆ Entire work i.e. from equipment/plant detail design including civil work, design and execution to commissioning is on **Turnkey** basis hence the supplier has to provide guarantee of successful running of the CTL Plant.
- ◆ General description of design consideration and all the assumptions to be made by the Vendor
- ◆ Vendor must suggest appropriate layout for complete plant and utilities to arrange the space or plot and the time frame in which the parallel work should be started for civil activities after getting the purchase order.
- ◆ Sufficient sets of spares should be included in the list of commissioning spares. Any additional spares over and above this list required for commissioning shall be provided by the supplier
- ◆ A detail Bar Chart for progress of work should be provided
- ◆ Catalogues/complete documentation including detail design, drawings of plant/equipment and instruments along with operation manuals should be provided.
- ◆ Latest calibration certificates for all equipment/instruments/control accessories from manufacturer/ competent authority should be supplied.

- ◆ Necessary NOCs should be obtained from Competent Authorities like pressure vessels, gas storage systems, Reactors, Compressors etc.
- ◆ Q.A.P. (Quality Assurance Plan) should be provided
- ◆ List of exclusions, deviations and references should be provided
- ◆ Weight of each items/equipment should be provided.
- ◆ Complete motor details like kW rating, CDF, duty class, class of insulation, make etc.
- ◆ List of commissioning spares, testing procedure.
- ◆ Any other details which may be felt necessary.
- ◆ All tools & tackles, apparatus, special instruments required for installation, testing, commissioning and establishment of Performance Guarantee Test (PGT) shall be arranged, stored, maintained and guarded by the Successful Vendor.
- ◆ Until the plant and equipment are handed over to the purchaser, the successful Vendor shall be sole custodian of all materials; equipments assembled at site and will be responsible for loss, theft, damage or destruction. For this purpose the successful Vendor shall arrange insurance at his own cost to cover the assets.
- ◆ On completion of work, all rubbish debris, temporary supports, enabling structures etc. shall be removed from the site and the site (including storage site) handed over to the purchaser in a tidy manner. All scrap etc. shall be dumped suitably at specified places as directed by the purchaser.
- ◆ CIMFR Scientists and Representatives may visit the fabrication site with prior intimation to assess the progress
- ◆ All high-pressure equipment, instruments, electrical items and fittings should conform to the international safety standards, as applicable. Necessary certificates should be provided.
- ◆ The Project will be executed on **TURNKEY** basis and the Project must be completed **within 12 months** from the date of Purchase order.
- ◆ Tapping of electricity from outgoing terminal of purchasers LT board and located at an approximate distance of 100 M including supply of four pole SFU and MCBs of suitable rating. Proper earthing should be provided for the Plant, Electrical Panel and Control Panel as per IS norms. In order to ensure standard power factor of 0.95, bank(s) of 415 V Capacitors with automatic switching ON/OFF arrangement for the correction of Power Factor in stages through suitable type of correction relays to be

provided. Cable lay-out drawing for instrumentation and electrical throughout plant should be provided.

- ◆ Water tapping will be available at an approximate distance of 100 m. Water storage system of sufficient capacity should be provided by the vendor. Over head water storage tank should be provided for emergency water supply wherever required along with proper control system.
- ◆ All structural mild steel should conform to IS 2062, Grade A for rolled sections and plates up to 20 mm thickness.
- ◆ Surface drainage should be provided as per site requirement
- ◆ The purchaser reserves the right to accept/reject the offer in totality or split the scope of supply or alter the specified quality of supply or delete any item from the scope of work without assigning any reason.
- ◆ During commissioning cold testing as well as two experimental runs at hot conditions of 48 hours duration should be conducted.

Warranty

Successful Bidder should provide One year on-site warranty for the entire plant from the date of handing over the plant. Price should be quoted for additional Warranty of Two Years.

AMC : The bidders must quote AMC charges, which will be freezed for future reference.

Payment Terms

- (i) **40% of the order value may be paid as advance against Bank Guarantee.**
- (ii) **20% of the order value may be paid after delivery of the full material of the CTL Pilot Plant.**
- (iii) **10% of the order value after successful installation and erection.**
- (iv) **Rest 30% after successful commissioning, demonstration, training and handling over the Plant against PBG.**

Past Experience

The bidders must have past experience for executing at least two similar kind Pilot Plant with successful installation and commissioning. The order value of the previous Pilot Plant should be at least of Rs.2.0 Crore. The clause must be given/highlighted in the NIT for pre-qualifying of the tenders.

List of Equipments with specifications and Make/Model

SI No.	Name of the Instrument	Broad Specification	Make/Model
1	Pressure gauge	Bottom or back Mounted, Wetted parts of SS 316	Wika/Dwyer/Waree
2	MFC	MOC (Wetted Parts) SS 316 Accuracy +/- 0.5% Repeatability +/- 0.5 % Output signal 0-5 VDC & 4-20 mA	Bronkhorst/Brooks
3	NRV	Screwed or flange end, SS 316, PTFE seated. Wafer type or poppet type	Swagelok/Parker/Hamlet
4	BV	Screwed or flange end, Body SS 316, internally PTFE/EPDM seated	Swagelok/Audco/Virgo/BDK
5	TWV	Screwed or flange end, Body SS 316, internally PTFE/EPDM seated	Swagelok/Audco/Virgo/BDK
6	Filters	5-7 microns, Body SS 316	Pall/Domnic Hunter/Swagelok Equivalent
7	TVC	4-20 mA, Flange ended Pneumatically actuated, Double Diaphragm, % opening type.	Avcon/Jordan/Samson/Audco
8	FCV	4-20 mA, Flange ended Pneumatically actuated, Double Diaphragm, % opening type	Avcon/Jordan/Samson/Audco
9	SRV	SS 316, threaded end connection, spring loaded	Swagelok/Parker/ Equivalent
10	TE	Two wire PT-100, variable length as vessel dimension	Watlow/Omega/Radix
11	Level transmitter	Ultrasonic / Capacitance Type. Inbuilt indicator, 4-20 mA output	Forbes Arshall/Metler/Fitzer/ Equivalent
12	pH Meter	Gel Filed membrane base, continuous online 4-20 mA output	Melter/Thermo/Equivalent
13	Rota meter	As per pump Flow Rates	Eureka/Scientific

14	Fasteners	Class 450 rating, SS 316 for process line, SS 304 for utility lines. Chemically itched	APL/Unbrako
15	Flanges	Forged, Class 450 rating, SS 316 for process lines, SS 304 for utility line. Chemically itched	Tested
16	Gaskets	O ring type.	
17	Electrical Cables	As per IP 65.Armard for supply lines and Multi core with SS spiral hose for communication line.	Finolex/Polycab
18	Cable Trays	250 mm * 50 mm* 2 mm CRCA	Fabricated
19	PLC	Process Controlling, Trending, Data Acquisitions etc	Allen Bradley/Siemens
20	Control Panel	To Accomodate PLC, MCBs, Relays, Push Buttons, Power Supply, Connectors	Designed and Fabricated
21	MCBs/Switchgears	For Electrical Power	Siemens/GE/ABB
22	Connectors	For Connection with filed instruments and power supply	IE/Phoenix/
23	HMI/Computer	For firing the set values and monitoring the process Data	Siemens/Sony/hp
24	Steam trap		Forbes Marshaall/Equivalent
25	Syngas Compressor	50 kg/cm ² & 10 Nm ³ /h Dynamic or Turbo Compressor(Centrifugal)	Hitachi/Atlas Copco/Dressr Rand
26	Pump	Centrifugal	Grundfoss/ITT/WILO
27	VFD	For rpm or motion variation & control	Siemens/Allen Bradly/ Yasakawa/ABB
28	Shed Flooring	Concrete surface with proper leveling and drainage system.	

29	Flame Proofing	Following safety regulations	International repute
30	Gas Sensors	Detection of CO, H ₂ , CO ₂ etc	Honeywell
31	FTIR On-line Gas Analyzer	50 gas analysis using FTIR based technology (Rack Mounted)	Make: GASMET Model: Cx 4000
32	GCs (No.: 1) On-line	i) With TCD, FID and suitable packed columns for analysis of feed and product gases. ii) With FID for analysis of Liquid Hydrocarbon Products equipped with suitable capillary column and SIMDIST application. GCs to be connected at out-let of the Multi-tubular FT Reactor	Varian/Perkin Elmer
33	IR, TCD & ECD Based on-line Gas Analyzer	a) Principles of Measurement: NDIR: CO, CO ₂ , CH ₄ , and C _m H _n Electro Chemical Detector (ECD): O ₂ Thermal Conductivity Detector (TCD): H ₂ b) Range of Detection Limit: CO: 0 – 50 %; CO ₂ : 0- 30% CH ₄ : 0 – 75 %, C _m H _n : 0-10% H ₂ : 0-70%, O ₂ : 0 - 20% Analyzer to be connected at out-let of the CO ₂ Scrubber	Make: Wuhan Cubic Optoelectronics Co. Ltd Model: Gasboard 3100
34	Bench Top Catalyst Testing Unit	Complete reaction system designed for catalyst evaluation in small quantity. Reactor Temperature: ≥ 500°C, System Pressure: ≥ 50 bar, Reactor size: 10 ml, Oven Temperature: ≥ 200° C	M/s Autoclave Engineers OR M/s Parr Instruments Company

Schematic Flow Diagram of the CTL Plant

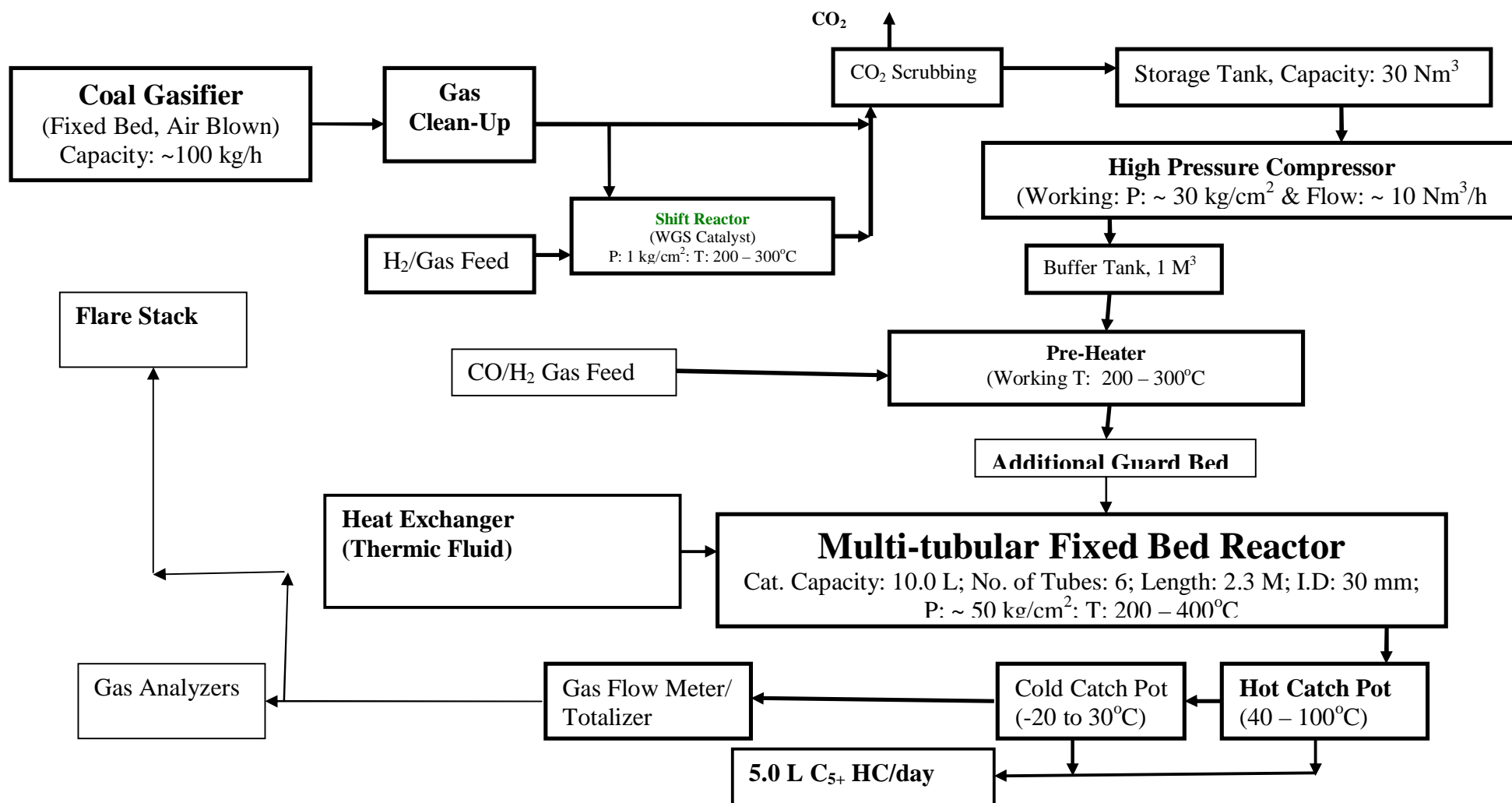


Fig: 1

Specification for X-ray diffractometer (XRD) system

Fully automatic high resolution X-ray diffractometer system with θ - θ Goniometer for airborne on-filter dust analysis (quartz), identification and quantification of minerals (especially in coal) and high temperature in-situ treatment of minerals.

Technical specifications:

1a. X-ray Generator: Computer controlled X-ray generator with good stability having the following ratings:

- Generator Output: 3 KW or above
- Tube voltage: 20-60KV (in steps of 1 KV)
- Tube Current: 2-60mA (in steps of 1 mA),
- Digital display of KV and mA and adjustable through computer.

The system should come with proper safety device and shield, fully protected enclosure as per international safety norms.

1b. X-ray tube: Copper anode target, but Mo target may be quoted as optional.

2. Goniometer:

- Automated θ - θ geometry, must hold the sample in a horizontal and stationary Position. Variable spinner facility should be provided as part of the system
 - Minimum angular range: -3 to $+160^{\circ}$ (2θ) or better
 - Angular accuracy: $\pm 0.0025^{\circ}$ or better
 - Scan speed: 0.001 to 2° per second or better, provision of fast scanning to be provided
 - Minimum step size: 0.0001° or better
 - Angular reproducibility: $\pm 0.0001^{\circ}$ or better
- for both step and continuous modes.

Automatic alignment of all the optical components should be the basic feature of the instrument.

Easy changeover from parallel beam to para-focusing geometry

3. Detector: Solid State Linear fast detector (optionally Scintillation counter may be quoted)

4. Diffracted beam monochromator : Graphite

5. Optics: Automatic variable programmable slit (DS, RS & AS)– it should be compatible with the high speed detector.
7. Software: PC based software package to control all instrument parameters and comprehensive X-ray diffraction analysis programme package for operation in the latest Windows environment.
8. Analytical task: Details are given hereunder-
- On-filter analysis of dust (size of PVC filter is 25 mm), low background sample holder with groove to be provided for this purpose.
 - Complete search/ match programme with back ground subtracted data, search-match with both ICDD as well as ICSD database for phase identification.
 - Suitable software package for both semi -quantitative and quantitative analysis
 - Rietveld quantification of identified phases (standard less quantification)
9. Computer and printer: Branded PC system (Del, IBM, HP or HCL) for operation with 19” TFT monitor and color laser printer (HP Colour Laserjet CP2025 N or better). The computer should have the minimum configuration: Intel Core 2 Duo, 500 GB Hard Disk, 4GB RAM, DDR2SDRAM 800 MHz, Operating system Microsoft XP preinstalled or better, DVD-RW, Optical Mouse and Keyboard (Multimedia), web cam, N media card.
10. Water chiller: Noiseless high performance chiller compatible with X-ray system to be supplied with the instrument, the supplier should provide fume hood with exhaust to expel hot air, in case it is necessary and install the same during installation of the XRD.
11. UPS: 3-phase on-line 20KVA UPS (from reputed and branded firms like Tata Leibert and Aplab) capable of one hour backup for the entire system including XRD, Chiller, PC and printer with battery bank having at least 3 years warranty
12. High temperature attachment: The HTA should be capable of attaining minimum 1500⁰C in different atmospheres. The attachment must include proper automatic controller and necessary vacuum pump (oil free).
13. Requirement: 1. Data quality guarantee with NIST standard should be provided by the manufacturer, 2. It is desirable that the model to be offered has been supplied to govt. organizations/CSIR/ other reputed organizations in the past 5 years
14. Warranty : The vendor should provide three years on-site comprehensive warranty from the date of installation of the instrument. Minimum essential spare parts for three years operation should be provided with the instrument. Products support for a period of minimum five years after warranty should be ensured by the firm.

15. Standards: Provide NIST standards, such as alumina plate, crystalline alumina powder, α -quartz powder for dust analysis and anhydrous kaolinite powder.
16. Installation and training: The equipment must be installed at the site of the user by trained persons from the supplier and the capabilities must be demonstrated in full as per specifications. The charges of installation and training may be included in the basic unit's price. Service manual should be provided. The supplier should provide training to the scientists on the site of installation.
17. Firm should also give single all inclusive price (FOB/FCA and preferably CIF values) of all essential component/supplies as per specification for the cost comparison purpose.

File No.13(2)/CIMFR-DC/10/10-11/PUR→
No04.

Sl No.	Detailed Specification of the item	Quantity
1.	Microscopic Photometer with Photomultiplier & complete set of unit for measuring precise reflectance of vitrinite as per ICCP & ISO/DIN Norm 7404 compatible with existing DMRXP & DM-4500 coal petrological microscopes.	01 No.



Central Institute of Mining & Fuel Research

Erstwhile Central Mining Research Institute
(Council of Scientific & Industrial Research)
 Barwa Road Campus, Dhanbad –826015 (Jharkhand), INDIA

COMMERCIAL TERMS & CONDITIONS

Important Notice

The Commercial Terms & Conditions is given in five different sections, which may please read carefully before submitting the tender. Any deviation and non-compliance of the terms & conditions must be written clearly. An incomplete offer and late bids are liable to be ignored and rejected. To aid the Bidders in submitting complete offers, a Check List is included in the bid document. The bidders must fill this and submit along with their offer in their own interest to avoid rejection of their tender.

Request For Proposal (RFP)

NIT No.

CIMFR/PUR/14(1)2010

1.Last Date for Submission of Bid :

30.08.2010 upto 4.00 P.M

2.Date of Opening of Tender(only Technical Bid in case of Double Bid System) :

31.08.2010 at 10.30 A.M

3.Date of Opening Financial Bid wherever applicable : TENDERERS WHOSE TENDERS ARE
 FOUND TECHNICALLY SUITABLE

SECTION - I

INVITATION FOR THE BIDS

Sealed tenders are invited under **Two Bids System** 1. Technical-Commercial Bid and 2. Financial Bid for the products mentioned in our Global / Open Tender Notice required to be supplied, installed, commissioned and demonstrated at CIMFR, Dhanbad. **Technical- Commercial Bid and Financial Bid should be identical in all respects except that the Technical-Commercial Bid should have blank space at the place where prices have been indicated in the Financial Bid.**

Tenderers are requested to submit their tenders in three separate envelopes 1. EMD Envelope, 2. Technical-Commercial Bid Envelope and 3. Financial Bid Envelope duly sealed and super scribed with "Tender No. and Description of item" strictly as per our Technical specifications and Terms and Conditions.

Technical-Commercial Bid should consist of:

1. Technical specifications being offered by the firm of Tender Documents along with Brochures and literature giving all features.
2. Certificate of Registration of firm
- 3. Authorization Letter from the manufacturer to quote and submit tender.**
4. Certificate of valid Authorised Distributorship/Dealership/Retailer ship from the manufacturer.
5. Latest Income Tax Clearance Certificate
6. Certificate of Central Sales Tax/Local Sales Tax Registration No. Authorised Service Provider Certificate from the Manufacturer only.
- 7. Photocopy of Warranty Service Provider Agreement between the manufacturer and the Service Provider.**
8. Clients list along with addresses, Telephone Nos., Fax Nos., Contact persons. Product supplied, Qty. supplied, Performance Certificates/Bench marking of the equipments by recognized National/Institutional/ Govt. organization like Department of Electronics.
9. Last Audited Balance Sheet of the firm.
10. Maintenance Infrastructure Facilities including addresses, Telephone No. of Service Centre.
11. Photocopy duly attested of Certificate of compulsory enlistment of Indian Agents of Foreign Principals with DGS&D (**wherever required**) quoting on their behalf. Date of enlistment must be before the date of opening of tenders.
12. Details of Equipments supplied of identical or similar nature to other CSIR Labs/Institute for the preceding three years along with the prices eventually or finally paid.

Commercial Terms :

- a. Percentage rate of CST/LST, Octroi, freight and forwarding charges, handling charges, loading/unloading charges, any other tax/charge as applicable should be clearly mentioned. The offers indicating "Taxes as applicable" or "Taxes inclusive" may be rejected.
- b. Validity of Quotation
- c. Delivery Period
- d. Payment Terms
- e. Warranty
- f. Training
- g. Discount
- h. Terms of Delivery
- i. Post Warranty AMC
- j. Performance Security Deposit
- k. Liquidated Damages
- l. Installation, testing and commissioning charges
- m. Percentage of Agency Commission in case of imports.
- n. Agency Commission should be included in the FOB Price and will be paid to the Indian Agents if registered with DGS&D (**wherever required**)
- o. Gateway Airport in case of shipment from abroad
- p. Beneficiary Bank and SWIFT No. in case of imports

Financial Bid should consist of:

Basic Price in case of indigenous supply/FOB price in case of imports

Commercial Terms

a. Percentage rate of CST/LST, Octroi, freight and forwarding charges, handling charges, loading/unloading charges, any other tax/charge as applicable should be clearly mentioned. The offers indicating "Taxes as applicable" or "Taxes inclusive" may be rejected.

b. Validity of Quotation

c. Delivery Period

d. Payment Terms

e. Warranty

f. Training

g. Discount

h. Terms of Delivery

i. Post Warranty AMC

j. Performance Security Deposit

k. Liquidated Damages

l. Installation, testing and commissioning charges

m. Percentage of Agency Commission in case of imports.

Agency Commission should be included in the FOB Price and will be paid to the Indian Agents if registered with DGS&D (**wherever required**).

n. Gateway Airport in case of shipment from abroad

o. Beneficiary Bank and SWIFT No. in case of imports

The bids complete in all respects addressed to the Director, CIMFR should reach at the following address **latest by 4.00 PM on 30.08.2010.**

Central Institute of Mining & Fuel Research

Erstwhile Central Mining Research Institute

(Council of Scientific & Industrial Research),

Barwa Road Campus, Dhanbad -826015, JHARKHAND, INDIA

' : 0091-0326-2296030, **G**: 0326-2296030,2202429

STD CODE: 0326

The Tenders (Technical Bids only wherever applicable) will be opened in this Office at 10.30 A.M hours on 31.08.2010 in the presence of Bidders (only one representative of the firm) who is willing to participate in the tender and whose EMD is in order.

SECTION - II

INSTRUCTION TO BIDDERS

1. Scope of Work:

Supply installation, testing, commissioning, demonstration and training in the usage and administration of procurement of products mentioned in our Open Tender Notice.

2. Bidders:

The invitation for Bid is open to all Indian Original Equipment Manufacturers / Authorized Distributors/Authorized Dealers/Authorized Retailers/Foreign Manufacturers or suppliers directly/authorized Indian Agents. In such cases where the tenders are submitted by the Indian Agents of their Foreign Manufacturer/Supplier or directly by the Principal to CIMFR, then the tender of Foreign Manufacturer/Supplier will only be considered and CIMFR will deal directly with the Foreign Manufacturer/Supplier or otherwise as decided by Director' CIMFR.

3. Cost of Bidding:

The bidders shall bear all costs associated with the preparation and submission of its bid and CIMFR will in no case be responsible or liable for these costs regardless of the conducts and the outcome of the bidding process.

4. The Bidding Documents:

The goods and services required, bidding procedures and contract terms are prescribed in the bidding document. In addition to the invitation for the bids, the bidding document includes:

- a) Instruction to bidders
- b) Schedule of requirements
- c) Technical Specifications
- d) Terms & Conditions
- e) Bid form and price schedule

The bidder is expected to examine all instructions, forms, terms and conditions in the bidding document. Failure to furnish all information required or submission of bid not substantially responsive to the bidding documents in every respect will be at the bidder's risk and may result in rejection of its bid.

5. Preparation of bids:

The bids are to be submitted in three separate sealed envelopes

- a) Earnest Money Deposit
- b) Technical-Commercial Bid
- c) Financial Bid

6. Submission of Bids :

a) Sealing and Marking of Bids

- i) The bids shall be submitted in three separate sealed envelopes addressed to **The Director, Central Institute of Mining & Fuel Research , Barwa Road, DHANBAD-826015 JHARKHAND, INDIA** which shall be marked as "EMD", "Technical-Commercial Bid" and "Financial Bid" mentioning Tender Number, Description of Item and Date of Opening and all the three envelopes should be put inside the big envelope.
- ii) The Envelopes shall indicate the name and address of the bidder to enable the bid to be returned unopened in case it is declared late and delayed.

Telex, cable, facsimile and unsigned bids will not be considered and rejected.

b) Deadline for submission of Bids

i) Bids must be received by CIMFR at the address given in Section-I not later than the time and date specified on the cover page. In the event of the specified date for the submission of bids being declared a holiday for CIMFR, the bids will be received up to the appointed time on the next working day.

ii) The Director, CIMFR may at his discretion extend the deadline for submission of bids by amending the bid documents, in which case all rights and obligations of the purchaser and bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

c) Late Bids

Any bid received after the deadline for submission of bids prescribed by CIMFR will be rejected and/or returned unopened to the bidder.

d) Bid Opening and Evaluation

Opening of Technical Bids by Purchaser

The Purchaser will open all Technical-Commercial Bids, if the EMD, is submitted as per requirement in the presence of bidders' representatives who choose to attend, at the time, on the date and venue indicated in Section-I. The bidders' representatives present there, shall sign a register evidencing their attendance. In the event of the specified date of the bid opening being declared a holiday for the Purchaser, the bids shall be opened at the appointed time and location on the next working day.

e) Clarification of Bids

i) During evaluation of the bids, the purchaser may at his discretion ask the Bidder for clarification of bids. The request for clarification and the response shall be in writing and no change in price or substance of the bid shall be sought, offered or permitted.

ii) No Bidder shall contact the Purchaser on any matter relating to its bid from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Purchaser, it should be done in writing.

iii) Any effort by a Bidder to influence the Purchaser in its decisions on bid evaluation, bid comparison or contract award decision may result in rejection of the Bidder's bid.

f) Evaluation of Technical Bid

i) Prior to the detailed technical evaluation the purchaser will determine the substantial responsiveness of each bid to the Bidding Documents. A substantially responsive bid is one that conforms to all the terms and conditions of the Bidding Documents without material deviations.

ii) A bid determined as not substantially responsive will be rejected by the purchaser and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

iii) All the vendors will have to bring their equipment/machine for testing and technical evaluation/benchmarking as and when asked for, if required. Separate communication will be sent in this regard.

The bidders short listed by the purchaser based on evaluation of their technical bids may be called for detailed discussion including presentation of their equipment system to a team selected by the purchaser for the purpose, at a specified date, time and venue, if needed.

g) Opening of Financial Bids

i) The purchaser will open the financial bids of only those bidders, which are found to be technically qualified to undertake the job. The time, date and venue of opening of financial bids will be intimated to these technical qualified bidders only.

ii) The Financial Bids of the technically qualified bidders shall be opened in the presence of their representatives, who are willing to participate, on the specified date, time and venue.

h) Evaluation and Comparison of Bid

i) The comparison shall be of all inclusive price of goods, inclusive of all costs as well as taxes paid or payable and the warranty period asked for.

ii) Arithmetical errors will be rectified on the following basis: if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity the unit price shall prevail and the total price shall be corrected. If the supplier does not accept the correction of errors, its bid will be rejected. If there is a discrepancy between words and figures, the amount in words will prevail.

iii) Bidders shall state their bid price for the payment schedule. Bids will be evaluated on the basis of this base price. Bidders are however, permitted to state an alternative payment schedule and indicate the reduction in bid price they wish to offer for such alternative payment schedule. The purchaser may consider the alternative payment schedule offered by the selected Bidder but it may not be binding on purchaser.

i) Placement of Purchase Order

The purchaser will place the purchase order on the successful bidder whose bid has been determined to be substantially responsive and has been determined as the best evaluated bid provided further that the bidder is determined to be qualified to perform the contract satisfactorily.

SECTION - III

TERMS & CONDITIONS

1. Submission of Tenders: Sealed tenders must be submitted in an envelope duly super scribing "Tender/File Ref.No., Description of item and Date of Opening" addressed to **The Director, Central Institute of Mining & Fuel Research, Barwa Road, Dhanbad - 826015 JHARKHAND, INDIA** in the Tender Box kept in the Office of the Stores & Purchase Officer, CIMFR, **latest by upto 4.00 PM on 30.08.2010 positively. Request for extension of submission date of tenders will not be considered.**

2. Late/delayed tenders : Late/delayed tenders due to any reason whatsoever will not be accepted / considered at all under any circumstance.

3. Opening of Tenders: The tenders received will be opened at **10.30 A.M.** on **31.08.2010** in the presence of the authorized representatives, if any, of quoting firm (one member only) at this office. **Request for extension of opening date of tenders will not be considered.**

4. Earnest Money Deposit: Tenderers shall have to deposit EMD of amount mentioned in our Global / Open Tender Notice in **Indian Rupees** or in equivalent amount in foreign currency in the form of Crossed Demand Draft/BG only in favour of Director, CIMFR, Dhanbad, issued by Scheduled/Nationalized Bank payable at Dhanbad, India, along with their tenders (with Technical Bid only). **The validity of the EMD submitted in the form of Bank Guarantee must be co-terminous with the validity of the offer. It must normally be valid for six months (180 days) from the date of opening of tender. Tenders received without earnest money will not be entertained/considered at all and rejected summarily. Tenders received along with EMD in the form of Cheque/Cash will not be accepted/ considered and rejected.**

Firms registered with DGS&D and NSIC may be exempted from payment of EMD if the product being quoted is actually manufactured by them and the product is registered with these agencies. Firms registered with these agencies selling products of other companies and not manufacturing the products being quoted by them are not allowed exemption from payment of EMD. Firms are to submit a legible photocopy duly attested, of Registration Certification of the products manufactured and registered with DGS&D and NSIC for availing EMD exemption before opening of Technical-Commercial Bids, otherwise tender submitted by them will not be considered and rejected summarily.

5. Forfeiture of EMD: The earnest money deposited (EMD) will be forfeited if the vendor withdraws or amends, impairs and derogates from the tender in any respect within the period of validity of tender or fails to furnish the Performance Security Deposit as per Clause No. 6 - Performance Security Deposit mentioned below.

6. Performance Security Deposit: The successful tenderer will have to furnish an unconditional Performance Bank Guarantee in favour of the Director, CIMFR, Dhanbad valid up to sixty (60) days after the warranty from a Scheduled/Nationalised Bank in India for 10% of the total order value within twenty one (21) days of the placement of order for orders where full payment is to be made on Letter of Credit/Sight Draft or on delivery, failing which the purchase order/contract shall be terminated.

b. The successful tenderer will have to furnish an unconditional Performance Bank Guarantee in favour of the Director, CIMFR, Dhanbad valid up to sixty (60) days after the warranty from a Scheduled/Nationalised Bank in India for 10% of the total order value before the release of final payment where payment is to be made on satisfactory supply, installation, testing, commissioning, demonstration and final acceptance of the products.

7. Refund of Performance Security Deposit: The Performance Security Deposit will be returned to the successful vendor after sixty days from the date of the completion of warranty period and no interest would be paid thereon.

8. Warranty: Equipments should be under free ONSITE comprehensive warranty for a minimum period of three years from the date of completion of satisfactory installation, testing, commissioning, demonstration and final acceptance of the products. A satisfactory service during the warranty period is defined as 95% uptime. In case 95% uptime is not provided, the warranty period would be extendable by a period which is equivalent to the period during which 95% uptime was not provided. **The bidder will also ensure that the spares are available at least for three years after the warranty period for the operation and maintenance of the equipments supplied. The firms giving the warranty offer less than three years must specify the equivalent amount to be charged for additional warranty/per year which will be added to the price quoted for deciding Lowest Tender. Failing to quote the same will lead to rejection of the bid. This must be strictly complied.**

9. Custom Duty and Excise Duty: Our Institution is eligible for payment of concessional Custom Duty and exempted from payment of Excise duty.

a) In case, the tenderers are Indian Agents of the foreign suppliers and quoting prices on behalf of their foreign principals must enclose the proof of enlistment with DGS&D (**wherever required**). Date of enlistment must be before the date of opening of tenders. Tenders of agents not enlisted with DGS&D will be ignored and summarily rejected. The compulsory enlistment of Indian Agents of foreign principals with DGS&D is of general nature and does not confer on the Indian Agents the status of a supplier registered with DGS&D.

b) In case, the prices are quoted in foreign currency, it must be on FOB price. Indian Agency Commission/Technical Service Charges, if any, must also be shown separately and shall be payable in India in Indian Rupees only if the Indian Agent is registered with DGS&D. Kindly indicate Indian Agent's address, their kind of services and percentage Agency Commission (which will be reduced from invoice and paid in Indian Rupees Only). Also quotation should indicate whether Agency Commission is included / excluded in the FOB price.

c) In case of Domestic, the offer should contain the basic price and percentage of Excise Duty separately since we are exempted from payment of Excise Duty.

10. Prices: The price quoted should clearly mention whether

- a) **FOR destination /Dispatching Station by registered road transport**
- b) **FOR free delivery at this office Stores including Packing & Forwarding, freight, insurance charges, etc.**
- c) **Where there is no mention of the above, the offers will be rejected as incomplete.**
- d) **In case of Imports, the quotation should be for FOB price only.**

11. Taxes: The percentage rate of sales tax, resale tax, duties/levies and any other charges etc, should be clearly indicated in the tender, wherever chargeable. The packing charges must be included in the rates. **CIMFR is not authorized to issue C/D Forms.** However, the concessional rate of central sales tax is admissible to Research Institutions from certain States is also applicable to this Institute and necessary Concessional Sales Tax Certificate will be issued. The supplier should submit documentary proof while claiming octroi, naka etc. charges.

12. Annual Maintenance Contract: After the expiry of warranty period, ONSITE Comprehensive Maintenance Contract may be entered into for which the Annual Maintenance Contract (AMC) charges should invariably be quoted in terms of percentage (%) of cost on the exact amount inclusive of all taxes and duties of the product to be supplied.

Satisfactory services during AMC period is defined as 95% uptime. In case 95% uptime is not provided the AMC period would be extendable by a period which is equivalent to the period during which 95% uptime was not provided.

Response Time : Should be four hours

Preventive Maintenance: Tenderers should provide at least one preventive maintenance service every month during the AMC period.

13. Training: Tenderers should provide free training on the complete operation and care of the equipment and Software Packages to be supplied on mutually agreed terms.

14. Validity of Tender: The quotations shall be valid for a minimum period of **One Hundred Eighty (180) days from the date of opening of tenders.**

15. Delivery: Equipment may be delivered between 11.00 A.M. to 04.00 P.M. on all working days i.e. Monday to Friday at our Stores Section only.

16. Payment - Indigenous Supplier: Payment shall be made after delivery, satisfactory installation, testing, commissioning, demonstration and final acceptance of the ordered items by the user department, through an Account Payee cheque drawn on **State Bank of India, Hirapur Branch, Dhanbad-826 015 (Jharkhand)**, India within thirty (30) days from the date of submission of the bill. Bill(s) in triplicate duly pre-receipted with Rs.1/- revenue stamp will have to be presented for claiming payments.

17. Liquidated Damages: The LD clause of 01% per week subject to maximum 10% of the order value will be imposed on non-compliance of the order Terms & Conditions. The L.D may further be revised and enhanced as per the discretion of the Competent Authority, CIMFR on violation of the contractual terms of any form. Director, CIMFR reserves the right to go ahead with the procurement of ordered goods from any another vendor without giving any prior notice and cancel the purchase order. In such case, any additional impact on CIMFR over and above that contained in the Purchase Order shall be recovered from the successful vendor from the payment to be made by CIMFR or any of the CSIR Labs. to them towards earlier supplies, EMD or otherwise

18 S.T. Registration No./ITCC/Distributorship/Dealership/Service Provider Certificates:

Tenderers must attach a legible photocopy of the following documents positively along with their tenders.

- i) CST/Local Sales Tax Registration Certificate.
- ii) Latest Income Tax Clearance Certificate.
- iii) Authorised Distributorship/Authorised Dealership/Authorised Retailership/Authorised Service Provider Certificate from the manufacturers.

19. Environmental conditions for the installation of equipments: Tenderers should specify minimum environmental needs for installation of their Equipments such as air-conditioning specifications, power supply specifications including any special requirements like voltage regulators, etc.

20. Software installation: Tenderers should clearly specify the minimum hardware requirements for the installation of Software Packages positively.

21. Tenderers should note that they should offer their best products pertaining to Technical specifications given.

22. Tenderers should clearly indicate whether they are Original Equipment Manufacturers or authorized distributors/dealers/suppliers on behalf of manufacturers. Brand names & Model Nos. of all equipments and components offered should necessarily be mentioned.

23. Tenderers should furnish the experience of their organization in the area of manufacturing and/or supply of similar equipment.

24. Tenderers should have a well established Office and Service and Support Centre in Kolkata / Dhanbad, India, managed by qualified maintenance professionals along with documentary evidence to be attached with their tenders.

25. Tenderers should indicate the names (along with addresses, Telephone nos., Fax No., Contact person, dates of supply, etc.) of various Government, Public Sector Departments and other organizations where they have supplied and installed the similar equipments and are duly maintaining them.

26. Tenderers should furnish all details of Performance Certification/Bench marking of their Equipments by recognized National/International Institutes Govt. Organizations like D.O.E. (Dept of Electronics), etc as applicable.

27. All prices shall be quoted clearly both in figures and words duly taking into account all concessions provided by the Govt. of India as on the date of tender. In case of discrepancy in Unit and Total prices, unit price shall be taken to be final price for the purpose of calculations.

28. Tenders incorporating additional conditions are liable to be rejected.
29. Complete details including final specifications of the equipments offered/quoted should be furnished along with brochures/literature mentioning all features.
30. Tenderers should indicate whether they are the OEMs/. Authorised Distributors/Authorised Dealers/Authorised Retailer of the equipments offered and have valid license to sell Equipment.
31. Tenderers will also indemnify CIMFR against all possible damage due to any Copyright violation by them.
- 32 Only legal and authorised copy of Software Packages with all original manuals, installation and performance guide, etc. complete in all respects are required to be supplied.
33. Tenderers will replace equipments in toto, in case of any malfunctioning or other similar problems arise after supply of the equipment.
34. Equipment supplied will include all Operational and Maintenance Manuals, tutorials, reference manuals, installation and performance guide, etc. complete in all respects. Connecting cable and/or any other part/device which is essentially required for making the equipment operational is required to be supplied along with the equipment and n additional cost.
35. Printed conditions of the tenders shall not be binding on CIMFR.
36. CIMFR is an R&D organization under CSIR, Ministry of Science & Technology, Govt. of India. Therefore it is requested to **quote concessional rates applicable to the R&D organizations since the equipment is required for research purposes.**
37. Offers for stores vaguely described as "Best Indian Make", "Foreign Make" will be ignored while considering the tenders.
38. Details of Equipments supplied to CSIR Labs/Institutes: The tenderers who have supplied identical or similar equipment to other CSIR Labs/Institutions have to furnish the details of such supplies for the preceding three years along with the prices eventually or finally paid positively.
39. **Responsibility:** The responsibility lies with the successful tenderer, if any damage or loss to the property of the Institute occurs while undertaking and executing the contract.
40. **Shortage of Supplies:** Suppliers will have to make the good the shortages, if any, which is revealed after opening the packages. The Stores, which are spoiled/damaged during transit due to faulty packing will have to be replaced by the suppliers. The product should have warranty for workmanship, performance and service for a minimum period of twelve months from the date of acceptance of replacement of spares/parts during warranty period. The replacement should be done free of all costs including to and fro Air Freight, packing, forwarding and insurance charges.
41. **Defects and Liability Period:** Thirty six months from the date of virtual completion, installation and commissioning of the equipments as certified by CIMFR, Dhanbad, India.
42. **Damage and Unaccepted supply :** The material found to be damaged and declared rejected should be collected by you at your risks and costs within 21 days from the date of intimation by CIMFR, otherwise ground rent will be charged.
- In addition to the Terms and Conditions mentioned above, Terms and Conditions for the items offered from abroad are as follows:
43. The detailed specifications of the material offered should be given. Relevant technical Literature and descriptive catalogue / pamphlet should also be attached with the offer.
44. **FOB Price only to be indicated.** Other charges applicable to be indicated separately.

45. INSURANCE: Insurance will be done by our own means for imports. Please intimate immediately after shipment about the Airway Bill No. For indigenous items the cost must include the insurance charges.

Bill of Lading, consignment etc. to The Director, CIMFR, P.O + Dist: Dhanbad, Dhanbad, Jharkhand, India.

46. WARRANTY: Warranty period should be for a minimum period of **three years onsite comprehensive.**

47. COUNTRY OF ORIGIN: Please specify Place/County of Origin and the Place/Country from where goods will be finally shipped. These particulars are very important for establishment of Letter of Credit and arranging insurance.

48. VALIDITY PERIOD: Your offer should be valid for at least One Hundred Eighty (180) days from the date of opening of tenders.

49. Please also indicate names and addresses of some of the Indian Organizations to whom you have supplied material, if any, under reference.

50. This Institute is eligible for payment of concessional customs duty under OGL Scheme. Actual User-Condition (Non-industrial-R&D institution).

51. INDIAN AGENT'S COMMISSION: If you have any Agent in India, please indicate specifically whether the amount of agency commission payable to the agent is included in the FOB Price or not. Moreover, Indian Agent should have compulsory registration with DGS&D, Govt. of India (**wherever required on case to case basis**). Please note that the tender will not be considered if the Indian Agent is not Compulsorily registered with DGS&D, Govt. of India and Agency Commission will not be paid to the Indian Agent unless a legible photocopy of DGS&D Registration Certificate duly attested is submitted to this office. The Indian Agents Commission will be paid in Indian Rupees only within thirty days from the date of commissioning and final acceptance of the whole system by CIMFR, Dhanbad-828 108, India. The role played by the Indian Agents in rendering assistance to your customers may also be specified.

52. FREIGHT: The mode of dispatch should be Ocean Freight/Air Freight preferably by Air India Flight and on To-Pay basis only. Please indicate the approximate Air Freight Charges for Kolkata Air Port, India. The consignments are required to be shipped by Air India (Freight to pay) up to Kolkata Airport, India. All the documents are to be made in favour of Director, CIMFR, Dhanbad-826 001, India and forwarded to our Banker.

For speedy clearance, please specify our Purchase Order Reference No. and date on the top of the parcel as well as on the Airway bill without fail. Address all the consignments to **Director, CIMFR, Dhanbad-826 015**, India and not to Bank. The ordered materials are being imported under Open General License.

The following documents may be sent to us directly while dispatch.

Invoice in quadruplicate with deduction of Agency Commission, if any, Packing List, Delivery Challan, Country of Origin Certificate, Literature, if any, should be enclosed.

53. PAYMENT TERMS :

Term I - In case of indigenous orders, the payment will be on credit basis i.e. 100% after receipt of material in good condition, installation, testing, commissioning, satisfactory demonstration, final acceptance of the whole system and on submission of unconditional Performance Bank Guarantee for 10% of the total order value valid till 60 days after the warranty period from a Indian Scheduled Bank duly recognized by RBI.

Term II - In case of import orders, 80 percent value of goods will be paid through an Irrevocable Letter of Credit on submission of shipping documents. Balance 20 percent value of goods will be paid through L/C excluding Indian Agency Commission, if any, after installation, testing, commissioning, satisfactory demonstration, final acceptance of the whole system and on submission of unconditional Performance Bank Guarantee for 10% of the total order value valid till 60 days after the warranty period from a Foreign Bank duly endorsed by Nationalized Bank in India.

Term III - 100% payment after satisfactory installation & commissioning of the equipment if it is to be supplied for the first time in India or otherwise if the party does not have successful installation in India, against submission of unconditional Performance Bank Guarantee for 10% of the total order value within twenty one (21) days of the

placement of Purchase Order valid till 60 days after the warranty period from a Foreign Bank duly endorsed by Nationalized Bank in India. Director, CIMFR reserves the right to change the payment terms at his discretion from case to case basis depending on the merit of the case.

54. The tenders are liable to be cancelled if any of the conditions noted herein are not complied with. Hypothetical, ambiguous and conditional tenders will not be entertained at all and rejected summarily.

55. Goods should not be dispatched until firm Purchase Order is received by the successful vendor.

56. Director, CIMFR reserves the right to delete or alter the item given in the enclosed annexure depending on prevailing requirements.

57. Director, CIMFR reserves the right to accept or reject any tender in completely or in part thereof without assigning any reason.

58. Arbitration :

Except where otherwise provided in the Contract, all questions and disputes relating to the meaning of the specifications, instructions and terms & conditions herein before mentioned and as to the quality of the materials, as to any question, claim, right, matter or thing whatsoever, in any way arising out of or relating to the Contract. Specifications, estimates, instructions, orders

or these conditions or otherwise concerning the works, or the execution of the same whether arising during the process of the work or after the completion or abandonment thereof shall be **referred to the sole arbitration of a person nominated by the Director General, Council of Scientific & Industrial Research, New Delhi**, and if he is unable or unwilling to act to the sole arbitration of some other person appointed by him willing to act as such arbitrator. The submission shall be deemed to be submission to Arbitration under the meaning of the India Arbitration & Conciliation, 1996 or any satisfactory modification or reenactment thereof for the time being in force conclusive and binding on all parties of the Contract. **The venue of the arbitration will be Dhanbad only.**

In the case of a dispute between the purchaser and a foreign supplier, the dispute shall be settled by arbitration in accordance with provision of clause above. But if this not acceptable to the supplier then the dispute shall be settled in accordance with provisions of UNCITRAL (United Nations Commission of International Trade Law) Arbitration Rules. The venue of the arbitration shall be the place from where the order is issued.

SECTION - IV

FORMATS FOR BID SUBMISSION Checklist for Bid Submission

The following check-list must be filled in and submitted with the bid document:

Technical Bid:

1.	Has the tender document issued to you?	Yes / No
2.	Have you attached the technical bid form?	Yes / No
3.	Have you attached a copy of the last audited balance sheet of your firm?	Yes / No
4.	Have you attached proof of the manufacturer's authorization?	Yes / No
5.	Have you attached the details of the income tax registration and latest income tax clearance certificate?	Yes / No
6.	Have you attached the statement of deviations from the technical Specifications in the format?	Yes / No
7.	Have you provided details of your maintenance infrastructure facilities including addresses of the service centers in the format	Yes / No
8.	Have you attached the technical details of the goods and services offered as a part of this bid document?	Yes / No
9.	Have you attached the copies of relevant work orders executed during the last three years?	Yes / No
10.	Have you attached the details of identical or similar equipments supplied to other CSIR Labs/Institutes for the preceding three years together with prices eventually or finally paid?	Yes / No
11.	Have you attached photocopy duly attested of Certificate of compulsory Enlistment of Indian Agents of foreign principals with DGS&D if quoting on their behalf? Date of enlistment must be before the date of opening of tenders.	Yes / No
12.	Have you attached Service Provider Certificate issued by the Manufacturer?	Yes / No

Financial Bid:

1.	Have you attached the Financial Bid?	Yes / No
2.	Have you attached the price schedule for the goods/services offered in the Format?	Yes / No
3.	Have you attached the statement of deviations from the Financial terms and conditions in the format?	Yes / No

Please arrange your tender document for each part as given below:

Earnest Money Deposit :

TECHNICAL BID:

Technical Bid Form

Copy of the Last Audited Balance Sheet of the company

Income Tax Registration Certificate/PAN No.and latest Income Tax Clearance Certificate

Proof of Manufacturer's authorization

Photocopy of Warranty Service Provider Agreement between the manufacturer and the Service Provider.

Statement of Deviation from the technical specifications

Details of service centers at Dhanbad

Photocopy duly attested of Certificate of compulsory enlistment of Indian Agents of foreign principals with DGS&D if quoting on their behalf. Date of enlistment must be before the date of opening of tenders?

Copies of relevant work orders

Details of supplies of identical or similar equipment made to other CSIR Labs/Institutions for the preceding three years together with price eventually or finally paid.

FINANCIAL BID:

Financial Bid Form

Estimated quantity and Financial Bid Analysis

Statement of Deviations from Financial terms and conditions

Technical Bid Form

(To be submitted on the firm's Letter Head and signed by an authorized person)

To ,
The Director
Central Institute of Mining & Fuel Research
P.O. DHANBAD Barwa Road,
DHANBAD – 826015, Jharkhand,INDIA

Ref: Tender No.CIMFR/PUR/14(1)2010 dt.16.07.2010.

Sir,

Having examined the bidding documents, the receipt of which is hereby duly acknowledged, we, the undersigned offer to supply and deliver goods as per the schedule of requirements and in conformity with the said bidding documents.

We undertake, if our bid is accepted, to deliver the goods in accordance with the delivery schedule specified in the bidding documents.

If our bid is accepted, we will submit a unconditional performance bank guarantee for the sum equivalent to 10% of the Contract Price i.e. Total Order Value for the due performance of the Contract, in the form prescribed by the Central Institute of Mining & Fuel Research, Dhanbad.

We agree to abide by this bid for a period of One Hundred Twenty days after the date fixed for opening and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

We declare that we are the manufacturers/authorized agents/distributor of

that we/our principals are equipped with adequate machinery for production, quality control and testing of offered products manufactured/developed and used by us.

2. We hereby offer to supply the Goods/Services at the price at the rates mentioned in the Financial Bid.

3. We enclose herewith the complete Technical Bid as required by you. This includes:

Technical Bid Form

Copy of the last audited balance sheet of the company

Proof of Manufacturers authorization.

Technical details of the goods and services offered.

Statement of deviation from the technical specifications

Details of local service centers

Product catalogues/user manual/other informative material about our products and Services.

Details of supplies of identical or similar equipment to other CSIR Labs/Institutes for the preceding three years together with prices eventually or finally paid.

Photocopy duly attested of Certificate of compulsory enlistment of Indian Agents of Foreign principals with DGS&D if quoting on their behalf. Date of enlistment (It must be before the date of opening of tenders).

4. We have carefully read and understood the terms and conditions of the bid document and the conditions of the contract applicable to the bid document and we do hereby undertake to supply as per these terms and conditions.

5. Certificate that the bidder is:

A Sole proprietorship firm and the person signing the bid document is the sole proprietor/constituted attorney of the sole proprietor, or

A partnership firm, and the person signing bid document is a partner of the firm and he has authority to refer to arbitration disputes concerning the business of the partnership by virtue of the partnership agreement/by virtue of general power of attorney, or

A company and the person signing the document is the constituted attorney.

(NOTE: Delete whatever is not applicable. All correction/deletions should invariable by duly attested by the person authorized to sign the bid document)

6. We do hereby undertake take, until a formal work order is prepared and executed, this bid, together with your written acceptance thereof and placement of letter of intent awarding the work order, shall constitute a binding contract between us.
Dated this day 2004 Signature of Bidder

Details of enclosures.

Full Address _____

Telephone No. _____

Telegraphic Address: _____

Fax No _____

E-Mail _____

COMPANY SEAL

**STATEMENT OF DEVIATIONS FROM TECHNICAL SPECIFICATIONS AND
SCHEDULE OF REQUIREMENTS**

Following are the Technical deviations and variations from the Technical specifications and Schedule of Requirements. These deviations and variations are exhaustive. Except these deviations and variations, the entire work shall be performed as per your specifications and documents.

SI No.	Item	Statement of Deviations / Variations

Signature of the Bidder

Name:

Date:

Place:

Address:

Company Seal

**MAINTENANCE INFRASTRUCTURE FACILITIES INCLUDING ADDRESSES OF
THE LOCAL SERVICES CENTRES**

LOCATION	ADDRESS OF SERVICE CENTRE	NAME OF THE CONTACT PERSON WITH TEL. No. Fax No. and Email	Total No. of qualified service engineers	Remarks

Signature of the Bidder

Name:

Date:

Place:

Address:

Company Seal

Financial Bid Form

(On the Letter Head of the firm submitting the Bid Document)

To
The Director
Central Institute of Mining & Fuel Research
P.O.DHANBAD, DISTT: DHANBAD
PIN - 826015, Jharkhand, INDIA

Ref: Tender No. CIMFR/PUR/14(1)2010 dt.16.07.2010.

Sir,

Having examined the bidding documents and having submitted the technical bid for the same, we, the undersigned, hereby submit the Financial Bid for supply of goods and services as per the schedule of requirements and in conformity with the said bidding documents.

We hereby offer to supply the Goods/Services at the prices and rates mentioned in the Financial Bid.

We do hereby undertake that, in the event of acceptance of our bid, the supply of Goods/Services shall be made as stipulated in the schedule to the Bid document and that we shall perform all the incidental services.

The prices quoted are inclusive of all charges including installation and commissioning charges in the Central Institute of Mining & Fuel Research Institute, Dhanbad.

We enclose herewith the complete Financial Bid as required by you. This includes:

Financial Bid Letter

Price Schedule

Statement of deviations from Financial terms and conditions.

We agree to abide by our offer for a period of One Hundred Twenty (120) days from the date fixed for opening of the bid documents and that we shall remain bound by a communication of acceptance within that time.

We have carefully read and understood the terms and condition of the bid document and we do hereby undertake to supply as per these terms and conditions. The Financial Deviation are only those mentioned in the statement of deviation from financial terms and conditions.

Certified that the bidder is:

A sole proprietorship firm and the person signing the bid document is the sole proprietor/constituted attorney of sole proprietor.

Or

A partnership firm and the person signing the bid document is a partner of the firm and he has authority to refer to arbitration disputes concerning the business of the partnership by virtue of the partnership agreement/by virtue of general power of attorney.

Or

A company and signing the bid document is the constituted attorney.

(Note: Delete whatever is not applicable. All corrections/deletions should invariably be duly attested by the person authorized to sign the bid document).

We do hereby undertake, that until a formal work order is prepared and executed, this bid, together with your written acceptance thereof and placement of letter of intent awarding the work order, shall constitute a binding contract between us.

Dated this day of _____ Signature of Bidder

Details of enclosures

Full Address:
Telephone No.
Telegraphic Address:
E-mail:

COMPANY SEAL

PRICE SCHEDULE - Estimated Quantity and Financial Bid Analysis

Sl No	Item Name	Qty.	Manufacturer	Model Name & Version	Compliance to suggested Technical Specification	Operating System Environment	Unit Cost Rs.	Total cost (inclusive of all other charges)

1. Attach sheet giving detailed Technical Specification and deviations for the suggested systems.

NOTE

- (i) For Financial bid comparison total Value in Col. No. 9 shall be the basis.
- (ii) Unit value quoted in actual quantity of work shall form the basis.
- (iii) The Bid should have Col. 3 x Col. 8 = Col.9. Any error in the Table of any bidder is liable to be out rightly rejected.
- (iv) The price quoted should be inclusive of all charges including all applicable taxes, Octroi, freight and handling charges, and all other miscellaneous expenses.
- (v) In case of discrepancy between unit price and total price, the unit price will prevail.
- (vi) Annual Maintenance Charges after warranty period should be quoted separately.

Signature of the bidder

Name :

Place :

Date :

Address :

Company Seal

STATEMENT OF FINANCIAL DEVIATIONS

Following are the financial deviations and variation(s) from the exceptions to the specifications and documents for the Bid document. These deviation(s) and variation(s) are exhaustive.

Except these deviation(s) and variation(s), the entire work shall be performed as per your specifications and documents.

SI No.	Section No.	Clause No.	Statement of Deviations / Variations

S. No. Section No. Clause No. Statement of deviation(s) and variation(s)

Signature of the bidder

Name:

Place:

Date:

Address:

Company Seal

PRICE SCHEDULE FOR GOODS BEING OFFERED FROM ABROAD

Name of the Bidder : _____

TENDER No.: _____

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>			
Sl. No.	Item Description	Country of origin	Unit	Qty.	Unit Price		Total Price(5x6)		Charges for Insurance & transportation to port/place of destination		Total Price (7+8) CIF
					FOB (named port of shipment)	FCA (named place of delivery)	FOB (named port of shipment)	FCA (named place of delivery)	Ocean	Air	

Note:

Currency

(a) Indian agents name and address _____ in words.

(b) Installation, commissioning & training charges, if any.

(c) Cost of spares: _____

Address : _____

(d) The Indian Agent's commission shall be paid in Indian Rupees only based on the Exchange Rate prevailing on the date of negotiation of documents in accordance with clause 22.1 of GCC.

(e) The cost of optional items shall be indicated separately.

Total Bid Price in Foreign

Signature of Bidder

Name

Business

PRICE SCHEDULE FOR GOODS BEING OFFERED FROM INDIA

Name of the Bidder : _____

Tender No.: _____

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>
Sl. No.	Item Description	Country of Origin	Unit	Qty.	Ex-works/ Ex-warehouse/ Ex-showroom off the shelf price (inclusive of all taxes already paid)	Total Price Ex-Works / Ex-warehouse/ Ex-showroom off the shelf price (inclusive of all taxes already paid) 5x6	VAT & other taxes like excise duty payable, if contract is awarded	Packing & forwarding upto station of dispatch, if any	Charges for inland transportation, Insurance upto Lab./Instt.	Installation, Commissioning and Training Charges, if any

Total Bid Price in Foreign
Currency in words:
Signature of Bidder

Name : _____

Address : _____

Note: (a) The cost of optional items shall be indicated separately.
(b) Cost of Spares.

BID SECURITY FORM

WHEREAS
 (hereinafter called "the Bidder") has submitted its bid dated(Date if
 submission of bid) for the supply of(Name and/or
 description of the goods) (Hereinafter called "the bid").

KNOW ALL PEOPLE by these presents that WE(Name
 of bank) of (Name of country), having our registered office at
 (address & phone & fax no. of bank) (hereinafter called "the bank"), are bound unto
 (Name of Purchaser) (hereinafter called "the Purchaser") in
 the sum of For which payment well and truly
 to be made to the said purchaser, the Bank binds itself, its successors, and assigns by these
 presents, Sealed with the common Seal of the said Bank this Day of
 200.....

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or
2. If the Bidder, having been notified of the acceptance of its bid by the Purchaser During the period of bid validity:
 - a) Fails or refuses to execute the Contract Form if required; or
 - b) Fails or refuses to furnish the performance security, in accordance with Instruction to Bidders.

We undertake to pay the purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is owing to it, owing to the occurrence or one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee shall remain in force up to and including 180 (One Hundred Eighty) days after the period of the bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

PERFORMANCE SECURITY FORM

To: _____ (Name of Purchaser)
 WHEREAS _____ (Name of Supplier) hereinafter called "the Supplier" has undertaken, in pursuance of Contract No. _____ dated _____ 2007 to supply _____ (Description of Goods and Services) hereinafter called "the Order" AND WHEREAS it has been stipulated by you in the said order that the Supplier shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the order.

AND WHEREAS we have agreed to give the Supplier a Guarantee:
 THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of _____ (Amount of the Guarantee in Words and Figures) and we undertake to pay you, upon your first written demand declaring the sum or sums within the limit of _____ (Amount Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the _____ day of _____

Signature and Seal of Guarantors

Date

Address

All correspondence with reference to this guarantee shall be made at the following address:

 (Name & address of the lab)