

TENDER DOCUMENT

TENDER SPECIFICATION No : **BAP : ERN : NSPCL : ESP : ELEC :C : 235**

NAME OF WORK:

ELECTRICAL WORKS OF ELECTROSTATIC PRECIPITATOR (ESP) INVOLVING HANDLING AT SITE STORES / STORAGE YARD, TRANSPORTATION TO SITE OF WORK, DISMANTLING OF EXISTING COMPONENTS, ERECTION, TESTING AND COMMISSIONING OF ELECTRICAL COMPONENTS OF ESP IN UNIT-1 & 2, CPP-II (2X 60 MW), NSPCL, ROURKELA, ODISHA USING CONTRACTOR'S OWN TOOLS AND PLANTS, CRANES , CONSUMABLES, MANPOWER ETC.

Issued to M/s. :

PART – I (TECHNICAL BID)



ERECTION SERVICES DEPARTMENT
BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
BOILER AUXILIARIES PLANT
INDIRA GANDHI INDUSTRIAL COMPLEX
RANIPET – 632 406

BHARAT HEAVY ELECTRICALS LIMITED
BOILER AUXILIARIES PLANT
RANIPET- 632406.

ERECTION SERVICES DEPARTMENT

TENDER SPECIFICATION NO. : BAP:ERN: NSPCL : ESP : ELEC : C : 235

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**BHARAT HEAVY ELECTRICALS LIMITED
BOILER AUXILIARIES PLANT
RANIPET – 632 406**

ERECTION SERVICES DEPARTMENT

SPECIAL INSTRUCTIONS TO BIDDERS

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1. This Booklet consists of the scope and bill of quantities of the entire work etc.
2. The Bidders are requested to go through the instructions contained in the documents attached and quote in the Rate Schedule attached.
3. The Bidders are advised to go through the General conditions of contract, Special conditions of contract, Tender specifications and all parts of this tender document and fully understand the scope of work before quoting. Any doubt in the documents should be got clarified from Erection Services Department of BHEL, Ranipet before submitting their offer.
4. Bidders shall note that all consumables, tools & tackles and **all the required Cranes / Trucks / Trailers / Tractors etc.** are to be provided by the contractor.
5. **The Tender Documents should be submitted duly signed and stamped in all the pages** of the Tender Specification, General conditions of contract, special conditions of contract, Annexure etc. by the Bidder.
6. Offer of the Bidder with all the required documents should be submitted so as to reach the specified addressee as per schedule given in the Notice Inviting Tender.
7. **ADDRESS FOR SUBMISSION / POSTING OF BID DOCUMENTS**

**THE OFFICE OF MANAGER ,
CIVIL TOWNSHIP,
(NEAR MUKUNDARAYAPURAM RAILWAY STATION)
BHARAT HEAVY ELECTRICALS LIMITED,
BOILER AUXILIARIES PLANT,
RANIPET – 632 406.**

Phone No.:04172 - 284883

8. Address for communication, clarifications etc.

**THE DY. GENERAL MANAGER,
ERECTION SERVICES,
BHARAT HEAVY ELECTRICALS LIMITED,
BOILER AUXILIARIES PLANT,
RANIPET – 632 406.**

Phone No.:04172 - 241171 / 284973 / 284554

Fax : 04172 - 242011

E- mail : mohankumar@bhelrpt.co.in

vramesh@bhelrpt.co.in

Contd...

9. **No advance payment towards mobilization of site operation** or for any other purpose will be made by BHEL. The payment for work will be made strictly as per payment terms in the tender specification.
 10. The bidders shall submit the duly filled in **Formats** given in this Tender document, along with the offer.
 11. **The retrofitting work shall be carried out in one ESP at a time by isolating it from the system.** Bidders are requested to carefully study and understand the sequence and schedule of activities as the retrofitting work affects the unit's operation. Time is the essence of the contract and all the resources required for completion of work in the stipulated time period has to be mobilized well in advance of the shutdown/ stipulated date.
 12. BHEL is not bound to accept the lowest or any bid and will have the right to reject any or all the bids without assigning any reason whatsoever. It is to be noted that a two-part evaluation system will be used for this tender. Please read the relevant portions of the tender / NIT. Hence it is essential that the Bidder submits a comprehensive technical proposal in their bid.
 13. **No special tools are envisaged to be provided by BHEL.**
 14. Approval, if any, required from statutory authorities like Labour Commissioner, Electricity Board, etc., should be obtained by the bidder at his own cost and risk.
 15. The bidder should mobilise maximum labour force from the local area of work.
 16. These Tender Documents are not transferable.
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BHARAT HEAVY ELECTRICALS LIMITED

BOILER AUXILIARIES PLANT, RANIPET- 632406.

ERECTION SERVICES DEPARTMENT**NOTICE INVITING TENDER**

Sealed offers in TWO PARTS are invited from experienced bidders meeting the requisite Qualifying Requirements (QR) for the work mentioned below. Points relevant to the tender are mentioned below and are to be complied with.

1. TENDER SPECIFICATION NO. : **BAP:ERN:NSPCL:ESP:ELEC:C:235**

2. **NAME OF THE WORK** :

ELECTRICAL WORKS OF ELECTROSTATIC PRECIPITATOR (ESP) INVOLVING HANDLING AT SITE STORES / STORAGE YARD, TRANSPORTATION TO SITE OF WORK, DISMANTLING OF EXISTING COMPONENTS, ERECTION, TESTING AND COMMISSIONING OF ELECTRICAL COMPONENTS OF ESP IN UNIT-1 & 2, CPP-II (2X 60 MW), NSPCL, ROURKELA, ODISHA USING CONTRACTOR'S OWN TOOLS AND PLANTS, CRANES, CONSUMABLES, MANPOWER ETC.

3. **EARNEST MONEY DEPOSIT** : **Rs. 1,50,000/-** (Rupees One Lakh Fifty Thousand only)

3.1 **EARNEST MONEY DEPOSIT (EMD)** : The offer submitted must be accompanied by the prescribed amount of EARNEST MONEY DEPOSIT. EMD shall be remitted along with the tender in the form of pay order or DEMAND DRAFT only drawn in favour of BHARAT HEAVY ELECTRICALS LIMITED payable at RANIPET. EMD in the form of bank guarantee / fixed deposit receipt or in any other form **will not be accepted.**

3.2 One Time EMD remitted at any other BHEL Unit / Power Sector **will not** be considered. **EMD amount remitted at BHEL/ Ranipet against this tender will only be considered.**

3.3 **An offer / bid that is not accompanied by the requisite EMD amount is liable to be summarily rejected.**

4. **TENDER SCHEDULE** :

a.	START OF SALE OF TENDER DOCUMENTS	27.09.2013 To 19.10.2013
b.	PRE- BID MEETING	Not Applicable
c.	START DATE & TIME FOR BID SUBMISSION	07.10.2013 at 10.00 Hrs
d.	DUE DATE & TIME FOR BID SUBMISSION	19.10.2013 at 14.30 Hrs.
e.	DATE & TIME OF OPENING OF TECHNICAL BID	19.10.2013 at 15.00 Hrs.

Note : ***Please obtain updated information from the BHEL website about the latest applicable dates.***

5. **PRE BID MEETING** : Not applicable

6. **OPENING OF TENDER** : Technical bids will be opened on the mentioned date at the office of THE MANAGER, CIVIL TOWNSHIP, NEAR MUKUNDARAYAPURAM RAILWAY STATION, BHEL, Ranipet.

NOTICE INVITING TENDER

- 6.1 In case the opening of the tender is a non-working day then the opening will be done on the next working day as per the time schedule.
7. Tender specification documents with complete details are hosted in web page (www.bhel.com). Bidders can directly download the same and use for submission of offer. Tender document charges shall be paid to BHEL along with or before submission of offer.
8. Interested bidders may alternately collect hard copy of tender specification documents from Erection Services Dept / BHEL / Ranipet on all working days (between 10.00 to 14.00 hrs) within the sale period on payment of tender document charges.
9. **Tender specification document charges (Non-refundable)** : Charges for Tender Specification document @ Rs.2000/- per Tender Specification shall be paid through Account Payee Demand Draft in favour of “Bharat Heavy Electricals” payable at Ranipet or in Cash at the cash counter of BAP/Ranipet. In the case of downloading of Tender Specification documents etc. from the web page, the bidder shall remit the tender document charges (Rs.2000/-) positively along with or before submission of offer. In the case of request by the bidder for dispatch of Tender Specification documents through Courier/Post, extra charges shall be paid @ Rs.500/- per Tender Specification. The tender documents are not transferable.
10. BHEL will not take any responsibility for delay/loss of documents or correspondence sent by courier/post.
11. All corrigenda, addenda, amendments, clarifications etc. to tender specification will be hosted in the web page (www.bhel.com > **Tender notifications** > **view corrigendum**) only and not in the news paper. Bidders shall keep themselves updated with all such developments.
12. **QUALIFYING REQUIREMENTS (QR) :**
Bidders shall essentially meet all the qualifying requirements in (a) & (b) as under:
- a. Bidder must have successfully executed Erection and Commissioning of **Electrical / “Electrical and C&I” work** in industries like steel plants, Refineries, Cement plants, Thermal Power plants, Captive power plants etc. in the last seven years as on 31.08.2013 as follows.
- (i) One work of atleast Rs.63.00 lakhs in a single work order.
(ii) Two works of atleast Rs.39.00 Lakhs each..
(iii) Three works of atleast Rs.31.00 Lakhs each.

(AND)

- b. The contractor must have achieved minimum average annual financial turn over of **Rs.23.00 Lakhs** during the last three financial years (FY) ending on 31/03//2013 or 31/03/2012, if the account for the FY 12-13 is not audited.

Fulfillment of QUALIFYING REQUIREMENTS: A bidder must satisfy all the qualifying requirements enumerated as in (a) & (b) above concurrently in order to qualify to participate in this tender.

13. Erection and commissioning of Electrical and C&I work mentioned in 12.0 above shall mean works involving both Electrical and C & I parts with major being that of Electrical. Normal O & M works/ Services, replacement of limited quantities of spares and minor rectification works shall not be considered as Erection. Successful execution shall mean the erected system / equipment has been commissioned.

NOTICE INVITING TENDER**14. Supporting documents for QR:**

Bidder shall submit documents in support of possessing qualifying requirements as under, duly self certified and stamped by the authorized signatory.

- (i) List of jobs done with the name of the project, Owner of the project, Name of the customer, Work order reference No and date, brief details of jobs, executed value, date of start, date of completion.
- (ii) Certified Photocopies of work orders issued by the Customer containing details of bill of quantities/schedule of rates and certificates for proof of satisfactory completion of work.
- (iii) Certified Photo copies of Audited profit and loss account accompanied by relevant schedules for turn over figures.

15. Acceptance of any bid shall be subject to the approval by BHEL's Customer/ Client.

16. Seeking clarification on Tender Specification: Clarifications, if any shall be sought through written communication only, indicating the specific clauses in the Tender Document, so as to reach the specified office at least seven days before the last date for bid submission. BHEL shall not be responsible for receipt of queries after the due date for seeking of clarification due to postal delay. Any clarification / query received after the last date for seeking the same may not be normally entertained by BHEL and no time extension will be given.

17. BHEL may decide holding pre-bid meeting (PBM) with any /all intending bidders. On such communication from BHEL, the bidder shall ensure participation in the same at the appointed time, date and place as may be decided by BHEL. **Bidders are advised to visit the site and completely familiarize themselves with the site conditions for this Retrofit job.**

18. All the information as called for in the various clauses and annexure of tender specification should be furnished. Please refer to the check list. The details so furnished shall be complete in all respects and as per the formats prescribed in the Tender specification (Statutory requirement of Contract). The bidder may have to produce original documents for verification, if so desired by BHEL.

19. BHEL reserves the right to reject any offer on the basis of unsatisfactory performance of the bidder in any on going job or any similar job in the past.

20. BHEL will operate CPSE purchase preference policy as applicable.

21. Offers received with any deviation or without relevant information are liable to be rejected.

22. Price bids received in any form other than prescribed in Part-II (PRICE BID) are liable to be rejected.

23. BHEL reserves the right to accept or reject any or all the bids without assigning any reasons whatsoever.

24. **VALIDITY OF OFFER :** The validity of the offer shall be 180 days from the date of bid opening (including extensions , if any). No unsolicited revision in the tender offer shall be entertained after opening of tenders and till expiry of the validity period.

25. **LIQUIDATED DAMAGES:** BHEL will impose Liquidated Damages as per suitable clauses in the Tender Specifications on account of delay, violation of contract conditions and non-performance attributable to the contractor.

NOTICE INVITING TENDER

26. **REVERSE AUCTION (RA):** BHEL Reserves the right to adopt the process of **Reverse Auction** (ON LINE BIDDING on INTERNET) among the bidders who are found to be qualified on the basis of technical bid. Refer the **General Terms and Conditions of reverse auction** in SECTION-VIII. No extension of time on this account will be entertained for bid submission.
27. If the reverse auction is unsuccessful as defined in the RA rules / procedure, or for whatsoever reason, the sealed Price Bids may be opened for deciding the successful bidder.
28. **BID EVALUATION :** The offer submitted by bidders who meet the requisite Qualifying Requirements will be evaluated in two stages, namely Technical- Bid Evaluation and Price Bid Evaluation. The Technical bid will be evaluated as per 'Technical-bid Acceptance Criteria'(TAC) enumerated in ANNEXURE-1 to NIT. The bids which obtain the minimum score specified in the TAC will only be acceptable and further considered for Price Bid Evaluation.
29. Bidders whose technical bids are found acceptable to BHEL shall be intimated separately about the status of their offers. Date of price bid opening shall be intimated to the qualified bidders only.
30. **PRICE BID EVALUATION CRITERIA :** The successful bid shall be based only on the Grand Total quoted value for the entire scope of work, in the sealed "Price bid" or RA, as applicable.
31. The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site "www.bhel.com".
32. **EPF registration :** Bidders should furnish the EPF code and registration details along with the bid. Bidders who have not registered and do not possess EPF code, if awarded the work, should immediately register and obtain the code.
33. **Benefits to Micro, Small & Medium Enterprises (MSE) :** Guidelines of the Govt. of India shall be followed to provide benefits to MSE. MSE suppliers can avail the intended benefits only if they submit along with offer, attested copies of either EM-II certificate having deemed validity (Two years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with CA certificate (Format enclosed as per Appendix – IV) applicable for the year, certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or small) where the deemed validity of EM-II is over. Date to be reckoned for determining the deemed validity will be the last date of technical bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier submits these documents
34. **ORDER OF PRECEDENCE :** In the event of any ambiguity or conflict between the clauses / statements in Tender Documents, the order of precedence shall be in the order below.
- a. Amendments / clarifications / corrigenda / errata etc. issued.
 - b. Notice Inviting Tender (NIT)
 - c. Price Bid
 - d. Technical Conditions of Contract
 - e. Special Conditions of Contract
 - f. General Conditions of Contract
 - g. Forms & Procedures

35. In the event of any conflict between requirements of a clause/s of this specification /documents/drawings/data sheets etc. and different standards / codes specified, the same is to be brought to the notice of BHEL before submission of offer, else BHEL's interpretation shall prevail.
36. Typographical error/missing pages/other errors in the tender documents noticed, must be brought to the knowledge of BHEL in writing before pre-bid meeting / submission of offer, else BHEL's interpretation shall prevail.
-

ANNEXURE – I				
Technical bid acceptance Criteria (TAC)				
S. No	Evaluation Parameter	Document to be submitted	Max Score (MS)	Evaluated Score (WS)
1	General Technical Competence based on past experience More than 10 years experience in Electrical works in Power plants, Steel Plants etc. gets 20 marks. Anything less gets marks proportionate to no. of years of experience	List of works & Completion certificate	20	
2	Ability to complete on Schedule based on past records Contractor to submit the actual time periods of completion for his past projects along with contractual schedules	Proof of contract dates	5	
3	Similar ESP Retrofit Experience 03 or more ESP Electrical works gets 15 marks. Anything less gets proportionate marks	Completion letter/certificate	15	
4	Past Safety Records & Safety Plan Proposed Reasonable and complete Plan gets 05 marks. Else proportionate	Plan/Availability of safety officer	5	
5	Electrical Contractor License If License is available in own name 05 marks. If license is to be obtained through another agency 0 marks.	Verifiable document	5	
6	Work Breakdown Structure and Time Schedule Reasonable and complete schedule gets 10 marks. Else proportionate marks	Macro Schedule	10	
7	Appropriate Equipment committed to be mobilised If cranes, Tools & tackles, Testing equipment are covered with appropriate numbers including source for procurement 15 marks; else proportionate marks	Equipment list	15	
8	Company Organisation and Appropriate Project Staff Organisaion If appropriate no. of staff with 10 years similar erection experience are committed 05 marks; else proportionate	Staff list	5	
9	Appropriate Skilled Labour committed to be mobilized If appropriate no. of skilled labour with similar erection experience are committed 05 marks; else proportionate	Letters/ Certificate	5	
10	Status reporting and Quality Control Appropriate Quality Assurance procedures for different works and appropriate project reporting system	Quality document	5	
11	Bid Appreciation / Site visit If site problems are brought out and site visit has been made 05 marks; else proportionate	Proof of visit	5	
12	Completeness of bid submission If all stipulated documents are submitted 05 marks; else proportionate	Index and corresponding contents	5	
	Maximum Total Points (MS)		100	
	Acceptance of Technical bid - Minimum Score to pass Technical Evaluation		50	

BHARAT HEAVY ELECTRICALS LIMITED
BOILER AUXILIARIES PLANT
RANIPET- 632406.
ERECTION SERVICES DEPARTMENT

PROCEDURE FOR SUBMISSION OF SEALED TENDERS

- A. The bidders must submit their offer in two parts in separate sealed covers prominently superscribed as PART-I TECHNICAL BID and PART-II PRICE BID and also indicating on each of the covers the following details.
- a. TENDER SPECIFICATION NUMBER
 - b. NAME OF WORK and
 - c. DUE DATE AND TIME FOR SUBMISSION
- B. **PART-I (TECHNICAL BID) COVER-I :**
- a. Excepting Rate Schedule, all other schedules, data sheets, formats, drawings and other details called for in the NIT / specification shall be enclosed in Part-I “Technical Bid”.
 - b. Supporting documents / annexure etc. as required in line with Qualifying Requirement shall be enclosed. The documents shall be indexed properly.
 - c. Part – II : (UNPRICED) – without indicating rates / price, but mentioning ‘QUOTED’ / ‘UNQUOTED’ against each item. The Taxes applicable shall only be indicated in the appropriate columns / space provided.
- C. **PART-II (PRICE BID) COVER-II :**
- a. All indications of price shall be given in this PART-II “Price Bid” only. Discounts, if any shall be indicated only in the price bid.
- D. These two Covers - I & II (PART-I AND PART-II) shall together be enclosed in a **third envelope (COVER-III) along with requisite EMD** as mentioned in the Notice Inviting Tender and this SEALED COVER shall be superscribed and submitted to **THE MANAGER, CIVIL TOWNSHIP, BHEL, Ranipet** at the address given in “Special Instructions to Bidders ” on or before the due date.
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TENDER SPECIFICATION NO. : BAP:ERN:NSPCL:ESP:ELEC:C:235**PROJECT INFORMATION**

1. Purchaser and Owner : M/s. NTPC-SAIL POWER SUPPLY CO. PVT. LTD., (NSPCL)
NOIDA
2. Location : **CPP – II (2 X 60 MW)**
NSPCL,
ROURKELA STEEL PLANT
ROURKELA, ODISHA.
3. Nearest Railway station : Rourkela
4. Air Quality : Normal Power Plant conditions
5. **Climate & Limitation to work**

	Description	From	To
Season (months)	Summer	March	May
	Rain	June	September
	Winter	Dec	Jan

Monthly Wind, Rainfall and Temperature			
Month	Avg. Rainfall (mm)	Atmospheric Temperature (deg c)	
January	5.12	24.7	8.7
February	18.52	27.2	11.6
March	3.74	33.5	15.7
April	23.2	38.8	21.5
May	40.02	40.9	25.3
June	199.02	38.5	26.8
July	380.46	33.2	25.2
August	385.36	32.5	24.9
September	265.72	32.7	24
October	44.66	32.1	20.1
November	18.48	29.2	14.3
December	8.54	25.5	9.4

Above Data is from : India Meteorological Department
(<http://www.imd.gov.in/>)

Highest parameters recorded	Value	Month
Peak Rainfall (mm)	385.36	August
Peak Wind velocity(m/s)	39	
Highest Temperature (deg)	40.9	May
Lowest Temperature (deg)	8.7	January

Before submitting his/her/their offer, the Bidder has to get thoroughly acquainted with the site conditions with reference to Operating procedures inside the plant, security rules for access and movements, HSE rules prevailing in the plant, site interference problems, movement of cranes / derricks etc. in the store yard / work site during material handling, erection, storage facilities available, constraints on access and movements, etc. No compensation or revision of rates will be entertained at a later date for not having proper knowledge of the site conditions.

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TENDER SPECIFICATION**TENDER SPECIFICATION NO. BAP:ERN:NSPCL:ESP:ELEC:C:235**

1.0 SCOPE OF WORK : The scope of work includes Dismantling of electrical components of the existing Electrostatic Precipitator (ESP) (to the extent required, Supply of illumination system, Handling at BHEL/Customer storage yard and shifting of new electrical components of ESP to site of erection, Erection, testing and commissioning of the entire ESP in Unit- 1 & 2, CPP-II (2 X 60 MW), NSPCL, Rourkela using contractor's own tools and plants, cranes, material handling equipment, consumables, manpower etc. The detailed scope of work is

1.1 Detailed scope of work : The scope of work consists of the following major parts.

- a. Supply of Illumination system
- b. Dismantling of existing electrical components of ESP.
- c. Erection & commissioning of electrical components of ESP (BHEL supplied) and illumination system (in the scope of supply of the contractor).

The detailed scope of work is explained herein under and further enumerated in the **Annexure – V** attached with this tender specification, Special Conditions of Contract and Schedule of Rates & Quantities attached along with this tender. Trial-run, testing & commissioning of the entire system within the contract time and to the entire satisfaction of the of M/s NSPCL and BHEL forms part of the work.

- 1.2 Each Unit has two ESPs. Retrofitting work will be carried out for one ESP at a time by isolating the same during a short shutdown of unit. While retrofitting of an ESP is in progress, the unit will be in operation through the second ESP. Hence necessary precautions are to be taken while executing the work.
- 1.3 Work includes handling of ESP components at site stores / storage yards, transportation to site of erection, handling at site of erection, preassembly, water washing etc. complete and hook up of the entire system as per drawings of BHEL.
- 1.4 Any dismantling and re-erection of existing material/s that is required to complete the specified work shall form part of the work and shall be carried out at no extra cost to BHEL.
- 1.5 The distance of BHEL / Customer stores / storage yard within the plant to site of erection is in a radius of about 1.0 km.
- 1.6 Area illumination for enabling the execution of electrical work shall be in the scope of contractor.
- 1.7 All the ESP materials & components (except illumination system) will be supplied by BHEL / Client on free issue basis and the contractor has to take receipt of them at the designated point, store them carefully, use them in the works as specified and required and finally account for them.
- 1.8 Dismantling of existing High Voltage Rectifier (HVR) Transformers and Erection & alignment of new HVRs shall be carried out by other agencies. However, testing and commissioning shall be in the scope the contractor.
- 1.9 Fabrication and erection of temporary structures, platforms, supports etc. for dismantling and erection of Electrical components of ESP forms part of the work. The temporary structures etc. erected shall be removed after completion of work at no extra cost.

- 1.10 Adequate quantity of Tools & tackles shall be arranged by the contractor for safe dismantling and erection of the Electrical components.
- 1.11 The scope of work also includes shifting and proper storage of dismantled materials at storage yard. The dismantled materials should be segregated and unusable materials should be devoluted to NSPCL scrap yard.
- 1.12 Being a retrofitting job, any work like cutting/grinding etc. of supplied materials/existing materials to suit to site conditions shall form part of the erection work and no extra charges will be paid on this account.
- 1.13 After completion of work, all the materials/equipment removed/shifted shall be re-installed/re-erected/placed back in their original locations or at locations as instructed by BHEL.
- 1.14 The contractor shall make suitable security arrangements including employment of security personnel (round the clock) to ensure the protection of all materials/equipments and works from theft, fire, pilferage and any other damage and loss at stores/storage yard/pre-assembly area/erection site, till the completion of work.
- 1.15 Trial-run, testing & commissioning of the entire system within the contract time and to the entire satisfaction of the customer and BHEL forms part of the work.

2.0 ROUND THE CLOCK WORK : Part of the work is to be carried during shutdown of the running plant and the relevant works have to be completed within the planned shutdown. This will call for working with enhanced resources and round the clock. The contractor shall provide for suitable illumination, security, labour amenities, etc for such working. Necessary safety gadgets shall be provided and ensured for the manpower during late hours. The bidder shall consider all such contingencies in their offer.

3.0 TERMINAL POINTS : The terminal points shall be from Inlet Funnel to Outlet of ID Fan (inlet to stack) and outlet of Ash handling system below ESP.

4.0 SITE LOCATION : Please see project information sheet.

5.0 TOOLS & TACKLES : It may be noted that **BHEL will not provide** any cranes , trailers / trucks / tractors, tools and plants for execution of the work. All required resources including derricks, winches, wire ropes and tackles, etc are to be arranged by the contractor only. Higher capacity crane/s required for completion revamping work within the stipulated period shall be arranged by the contractor at no extra cost to BHEL. The quoted the rate shall consider all the eventualities that may arise during such works.

6.0 CONSTRUCTION POWER & WATER : Required construction power and water to site shall be provided by BHEL on FREE OF CHARGE at one point only (within 500m). Necessary power cabling from the source to distribution boards, energy meters etc. and distribution pipe lines to different locations of water point with taps, valves etc., shall be provided by the bidder at his cost.

7.0 HEALTH, ENVIRONMENT AND SAFETY : The contractor shall follow good safety practices at the site. All personnel shall be provided the required safety protective gear and contractor to ensure that they are used. Safety training to be provided to all personnel at the site. In addition, the prevailing rules and regulations pertaining to Health, Environment and Safety (HSE) procedures of M/s NSPCL, project site rules, prevailing labour laws enforced by local authorities, labour regulations, movement of labour / vehicles inside the plant area, time keeping systems etc., in force and other local political conditions shall be studied before submission of this budgetary offer. The bidder shall submit a write-up, along with the Technical-bid, on the HSE procedures to be adopted subject to modification and acceptance by BHEL, covering at minimum

Personal Protective Equipment such as helmets, hard shoes, goggles, gloves, etc, safety training to staff and labour, daily safety pep talks & inspections, safety sign boards, housekeeping procedures, etc.

8.0 COMPLIANCE TO STATUTORY REQUIREMENTS: It is the responsibility of the contractor to obtain the required labour license from the appropriate authorities before commencement of work.

8.1 The contractor shall comply with all State/Central Laws, Statutory Rules, Regulations etc. inclusive of those regarding Labour and Industrial Laws which are applicable from time to time and shall comply with the provision of the same Labour Legislation, Rules and Regulations framed under the provision of Employees' Provident Fund and Miscellaneous Provision Act 1952, ESI registration, Labour License etc..

8.2 **ELECTRICAL CONTRACTORS LICENSE** : The Bidder shall enclose a copy of valid electrical contractors license applicable for the state where the site is located valid till commissioning of the ESP and ID Fan system. In case the Bidder is not in possession of such a license, they may execute the work through any other agency having such valid license. This may be indicated in the offer itself and acceptance of such party may be enclosed with the offers. Offers not having any of these, are liable to be rejected.

9.0 APPROVAL FROM CIEG : It is the responsibility of the Bidder to test, commission and obtain necessary safety certificates & approvals from the Electrical authorities for the equipment installed / erected by them and by the other agencies to enable commissioning of the system.

10.0 SITE MANAGEMENT :

- a. The contractor shall arrange to print all materials management forms, daily labour progress reports, and all other forms & reports etc., as indicated / instructed by BHEL and customer's HSE plan and project site rules. The Contractor shall depute well experienced senior site manager who shall liaise with BHEL and clients, coordinate all resources and works and complete the job satisfactorily. The bidder shall submit in his Technical bid a resume of the proposed site manager. In addition, the Contractor shall mobilize adequate numbers of well experienced site technical supervisory staff as well as skilled and unskilled labour.
- b. Erection Progress Reports shall be accompanied by Photographs (both hard & soft copies) as directed by BHEL Engineer at site.

11.0 MOBILISATION ADVANCE : **No advance payment** towards mobilization of site operation or for any other purpose will be made by BHEL. The payment for work will be made strictly as per payment terms in the tender specification.

12.0 FIRM PRICE : The Contractor has to keep his quoted rates firm for the entire contractual period including total extended period, if any, and no claim for revision of rates or price escalation is allowed under any circumstances.

13.0 VARIATION IN QUANTUM OF WORK : The details of quantum of work are indicated in the rate schedule which is only approximate and is likely to vary to the extent of PLUS or MINUS 15% of the scheduled quantities.(except for Sl. No. N of Section-II for which the quantities may vary beyond 15%).

14.0 EARNEST MONEY DEPOSIT (EMD) : The EMD amount to be remitted along with the offer and the mode of remittance shall be as indicated in the "Notice Inviting Tender".

15.0 SECURITY DEPOSIT (SD) : The successful Bidder shall within the time specified in the letter of intent deposit the required amount of security deposit. The SD shall be as per clause 1.8 of General Conditions of Contract (GCC).

16.0 TAXES AND DUTIES : Refer Annexure–III for terms & conditions related to Taxes & Duties.

17.0 PAYMENT TERMS : All payments for the works completed shall be paid based on bills raised by the contractor as payment terms and certified by Engineer-in-Charge of BHEL. **Payment for works will be made within a period of 30 days from the date of submission of bills along with all the enclosures as called for by BHEL. Payment will be only through e-payment** (through electronic fund transfer (EFT) / RTGS) only after deducting Bank charges as per BHEL terms of payment.

17.1 DETAILS OF PAYMENT TERMS FOR ERECTION & COMMISSIONING: The payment terms shall be as per clause 3.22. of Special Conditions of Contract for Electrical works (SCC - Section-III).

17.2 DETAILS OF PAYMENT TERMS FOR SUPPLY PART : The payment terms shall be as per clause.7 of Terms and Conditions for Supply of Materials in Annexure-IV.

18.0 PERIOD OF CONTRACT / DURATION OF WORK : **The total duration for the tendered scope of retrofitting work is 11 (Eleven) Months. The time period shall commence from date of erection of first component at site, as certified by BHEL Site Engineer.** The Time period for shutdown and erection activity are enumerated below and shall be strictly adhered to.

18.1 Tentative Time period of work : Refer Annexure -II

18.2 The contractor shall mobilise the resources like manpower, cranes, consumables, tools and plants required to complete the entire work with in the above said schedule.

19.0 LIST OF TOOLS & TACKLES : The list of Tools and tackles, cranes etc proposed to be deployed by the contractor shall be given along with the offer. In case of cranes, the range diagrams and load charts should be included for the models to be used for the job.

20.0 G.A Drawing : Layout drawing is attached for reference. The drawings are for ‘Tender’ purposes only, even if indicated otherwise, which may undergo revisions / changes during construction /execution stage.

21.0 Accommodation for Contractors’ personnel : BHEL **shall not** provide any accommodation facilities for the contractors’ personnel. All the necessary arrangements have to be made by the contractor, outside the Plant premises, at no extra cost to BHEL.

22.0 LIQUIDATED DAMAGES : If the work completion gets delayed and the contract period gets extended due to reasons attributable to the bidder, liquidated damages as per provisions of contract (clause No.2.7.5 of General conditions of Contract for Works) shall apply. All decisions of BHEL in this regard will only be final and binding on the Bidder.

23.0 EXTRA CHARGES FOR MODIFICATION AND RECTIFICATION WORKS: Refer Section-VII of the special conditions of contract.

24.0 OVER-RUN COMPENSATION (ORC): Refer Section-VIII of the special conditions of contract.

25.0 The following documents enclosed shall also form part of the tender:

- a. Technical bid evaluation Criteria – (Annexure-I)

- b. Tentative Schedule of activities – (Annexure –II)
 - c. Taxes & Duties - (Annexure –III)
 - d. Terms & Conditions for Supply of Materials – (Annexure –IV)
 - e. Technical Specification & scope of work – (Annexure- V)
 - f. General terms and conditions of work (ES:F:010)
 - g. Special Conditions of Contract for ESP works (BAP:ERN:SPN:MECH:ESP:01 – SECTION-III, IV & V)
 - h. Special Conditions of Contract – (Section –VI, VII and VIII)
 - i. General Terms and Conditions for REVERSE AUCTION (SECTION-IX)
 - j. Statutory requirement of contract (ES:F:009)
 - k. Appendix-I, II, III and IV
 - l. Data sheet for Illumination System ref. NSPCL:ILL:REV01
 - m. Drawings for Tender purpose
 - i. Layout of ESP
 - ii. Illumination system
 - iii. Typical Flexible cable Tray support arrangement
 - iv. Typical arrangement of Disconnecting switch & Support Insulator heater
 - v. Typical installation arrangement of Thermostat in Hopper.
 - vi. Typical installation arrangement of Hopper heater.
 - vii. Typical installation arrangement of Ash level indicator.
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ANNEXURE – II

TENDER SPECIFICATION No. : BAP:ERN:NSPCL:ESP:ELEC:C:235

TENTATIVE SCHEDULE OF ACTIVITIES FOR ELECTRICAL WORK

The dates for each activity given below are only indicative and are likely to change depending on other related activities. The contractor shall ensure that the work is completed within the Time Period stipulated.

S.No	Description of work	From	To	Time period
01.	Dismantling of electrical components of 1 st ESP in Unit-2.	26.10. 2013	05.11.2013	10 days
02.	Erection of new components of 1 st ESP in Unit-2.	01.12. 2013	25.12. 2013	25 days
03.	Dismantling of electrical components of 2 nd ESP in Unit-2.	02.01. 2014	11.01.2014	10 days
04.	Erection of new components of 2 nd ESP in Unit-2.	01.02. 2014	15.03. 2014	42 days
05.	Dismantling of electrical components of 1 st ESP in Unit-1.	24.03. 2014	05.04.2014	10 days
06.	Erection of new components of 2 nd ESP in Unit-1.	02.05. 2014	12.06. 2014	40 days
07.	Dismantling of electrical components of 2 nd ESP in Unit-1.	15.06. 2014	25.06.2014	10 days
08.	Erection of new components of 2 nd ESP in Unit-1.	20.07. 2014	31.08. 2014	42 days

ANNEXURE – III**TAXES AND DUTIES**

Page 01 of 02

A. FOR ERECTION & COMMISSIONING :

1.0 Rates quoted shall include all royalties, taxes, terminal taxes, Octroi, duties, Sales Tax on Works Contract, Entry Tax, Licenses, Deposits, Royalty, Stamp Duty, Central or Provincial Excise Tax and other taxes (**except Service Tax**) leviable under the state and the central Government Rules. BHEL will not entertain any claim whatsoever in this respect. No reimbursement on account of increase in rate of existing levies shall be made.

1.1 SERVICE TAX

1.1.1 The Bidder shall not include Service Tax in their quoted rates; but the bidder has to separately indicate the Service Tax rate, amount and workings thereof in the Price bid schedule included in the bid documents.

1.1.2 If service tax amount is not indicated separately in the price bid schedule included in the Bid documents, it will be presumed that the quoted rate is inclusive of applicable service tax and bids will be evaluated accordingly.

1.1.3 The bidder shall furnish proof of service tax registration with Central Excise Department specifying the name of services covered under this contract. Registration Certificate should also bear the endorsement for the premises from where the billing shall be done by the bidder on BHEL for this project.

1.1.4 Section-I : Pure Service not involving any supply of materials by Contractor:

a) Bidders have to quote the applicable Service Tax payable in the Price bid format included in the Bid document which shall be considered for evaluation. The same shall be considered for reimbursement against valid documentary evidence to successful bidders ie. Service Tax Registration Certificate, Original Invoice, Service Tax Payment Certificate and copy of Service Tax payment Challan.

1.2 VALUE ADDED TAX (VAT) FOR THE WORKS

1.2.1 **Price quoted shall be inclusive of VAT except service tax.** : Notwithstanding the fact that this is only an erection service contract not involving any transfer of materials whatsoever and not attracting VAT liability, being labour oriented job work, for the purpose of VAT the contractor has to maintain the complete data relating to the expenditure incurred towards wages etc. in respect of the staff/workers employed for this work as also details of purchase of materials like consumables, spares etc., inter alia indicating the name of the supplier, address and VAT Registration No. and VAT paid for the purchases, etc.

1.2.2 The bidder shall get registered with State VAT authorities and the registration certificate shall be forwarded to BHEL immediately after commencement of work. In case the bidder had already registered under respective State VAT, they must quote their registration Number and forward copy of Registration Certificate while submitting this tender.

1.2.3 The monthly/quarterly VAT return, duly incorporating the erection income from BHEL as turnover, should be submitted to BHEL at regular intervals with all annexure and details of payment of VAT (WCT).

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- 1.2.4 You have to obtain VAT Clearance Certificate from the concerned authorities as per the provisions of local VAT act, on completion of the project and submit along with the final bill.

B. FOR SUPPLY PART :

- 1.0 Rates quoted shall include all royalties, taxes, terminal taxes, Octroi, duties, Entry Tax, Central or Provincial Excise Tax and other taxes (**except VAT / CST**) leviable under the state and the central Government Rules. BHEL will not entertain any claim whatsoever in this respect. No reimbursement on account of increase in rate of existing levies shall be made.
- 2.0 Bidders shall indicate the applicable VAT / CST separately in the Price bid.
- 3.0 If VAT / CST is not indicated separately in the price bid schedule included in the Bid documents, it will be presumed that the quoted rate is inclusive of the applicable VAT / CST and bids will be evaluated accordingly.

C. OTHER TERMS & CONDITIONS

- 1.0 **New Levies / Taxes :** 16.4.1 In case Government imposes any new levy / tax after award of the work during the tenure of the contract, BHEL shall reimburse the same at actual on submission of documentary proof of payment subject to the satisfaction of BHEL that such new levy / tax is applicable to this contract. However, this is applicable for contract delivery period only.
- 2.0 **Statutory variations :** Statutory variations are applicable only in the cases of changes in Value Added Tax and Service Tax, during the contract delivery period. The changes implemented by the Central / State Government in the VAT Act / Service Tax during the contract deliver period, viz. increase / decrease in the rate of taxes, applicability, etc. and its impact on upward revision / downward revision are to be suitably paid/ adjusted from the date of respective variation. The bidder shall give the benefit of downward revision in favour of BHEL. No other variations shall be allowed during the tenure of the contract.
- 3.0 **Direct Tax :** BHEL shall not be liable towards Income Tax of whatever nature including variations thereof arising out of this contract as well as tax liability of the bidder and their personnel. Deduction of tax at source at the prevailing rates shall be effected by BHEL before release of payment as a statutory obligation, unless exemption certificate is produced by the bidder. TDS certificate will be issued by BHEL as per the provisions of Income Tax Act.
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ANNEXURE – IV**TERMS AND CONDITIONS FOR SUPPLY OF MATERIALS (ILLUMINATION SYSTEM)**

Page 01 of 02

1. **Packing and Marking:** The supplier shall arrange for securely protecting and packing the stores to avoid loss or damage during transit.
2. **Despatch :** The scope of supply includes secure packing and delivery at BHEL stores / storage yard at NSPCL, Rourkela site, i.e., F.O.R NSPCL site, Rourkela. Consignee shall be BHEL and delivery documents will be sent by BHEL in favour of their Client / Customer.
3. **Make of Materials :** The make of materials / components shall be as per the Technical specification only.
4. Products with I.S.I certification marks will be preferred.
5. Latest catalogues covering the items in quote shall be provided to BHEL.
6. Test Certificates, Operating and maintenance manuals as called for in the technical specification / BHEL Engineer, in the required number of copies shall be provided to BHEL at no extra cost.
7. **Terms of Payment:** Payment will be made within 45 days of satisfactory receipt of the materials at site. Where required by BHEL, the successful bidder must send the operation and maintenance manuals, test certificates, drawings, etc. as called for, for the materials ordered. These should be sent immediately after dispatch of the materials and a statement to that effect should be made in the invoice. Failure to comply with this provision will result in delay in payment of the bills. Goods dispatch either by V.P.P. or by the document presented through bank will not be accepted unless agreed to by BHEL. The transporter's copy of Excise invoice should accompany to the material. The original invoice along with other documents shall be directly send to BHEL.
8. **Liquidated Damages:** It is clearly understood among the parties to the contract that "Time is the essence of the contract". Therefore, the delivery of the goods specified in the purchase order should be made within the time limit prescribed. Where the seller supplies or dispatches the goods, beyond the delivery period specified, BHEL will have no obligation to accept the goods. If accepted, liquidated damages at the rate of ½ % of the value of goods delayed for each week of delay or part thereof will be levied without prejudice to any other relief of compensation due to the purchase under any other condition of this contract.
9. **Risk Purchase:** Alternatively, BHEL will be entitled purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute therefore. The supplier shall be liable for any loss which the purchaser may sustain by reason of such risk purchase in addition to penalty at the rate mentioned in the clause above.
10. **Preferential Delivery:** It should be noted that if a contract is placed on higher bidder as a result of this invitation to tender in preference to the lowest acceptable offer in consideration to the earlier delivery, the seller will be liable to pay to the purchaser the difference between the contract rate and that of the lowest acceptable tender on the basis of final price F.O.R. destination including all elements of freights, sales tax, duties and other incidental in case of failure to complete supplies in terms of such contract within the date of delivery specified in the tender and incorporated in the contract.

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11. **General:** BHEL reserves the right to split up the tender and place for individual items with different bidders and also increase the quantity.
12. **Inspection:** Inspection will be carried out by BHEL's duly authorized Inspecting Officer at the works of BHEL or at a place as specified by BHEL. The decision of the Inspecting Officer shall be final and rejected material shall be returned to the Seller at their cost and risk and after recovery of the value of the materials already paid, inward freight and other incidental charges. No correspondence and protests will be entertained under any circumstances.
13. **Insurance:** For Ex-Works or FOR Dispatching Station contracts, kindly advice telegraphically the dispatch particulars indicating the LR/RR number with date to BHEL to enable arrangement for insuring goods/equipments for transit hazards.
14. **Guarantee Certificate:**

PROFORMA : (As Applicable)

Certified that the materials dispatched vide RR/LBW/PBW No. _____ dated _____ conform to the quality as per specification of BHEL and guaranteed for 12 months from the date of putting the same into actual use/consumption or 18 months from the date of dispatch whichever is earlier against all manufacturing defects, faulty materials and bad workmanship, etc. If any defect is noticed during the above period, the defective materials shall be replaced or rectified free of cost within a reasonable time.

Date:

Signature & Seal

ANNEXURE – V

TENDER SPECIFICATION No. : BAP:ERN:NSPCL:ESP:ELEC:C:235

TECHNICAL SPECIFICATION & SCOPE OF WORK**1. INTRODUCTION**

- 1.1 The NSPCL Rourkela CPP-II comprises of two Units of 60 MW, each commissioned in the Year 1987 & 1988 respectively. Each Unit is installed with two numbers of ESPs. The ESPs were originally supplied by Elektrim, Warazawa, Poland.
- 1.2 The ESPs were originally designed for an outlet emission of 350 mg/Nm³. Due to deterioration in the coal quality and change in the operating condition of the boiler, the present level of emission is more than the specified norms by Pollution Control Board. Therefore, now NSPCL intends to take up Renovation & Modernizations of ESPs to bring down the outlet emission level to 75 mg/Nm³.
- 1.3 In this R & M/ Retrofitting work, BHEL envisages the modification in existing ESPs by extending the casing vertically to accommodate taller electrode system and extending the casing horizontally to accommodate additional two series fields in the available space between ESP outlet and ID fan.

2.0 RETROFITTING METHODOLOGY :

- 2.1 Retrofitting work of the Electrostatic Precipitator (ESP) in Unit-1&2 involves dismantling of the internals of the existing 05 fields (all the components materials except Support columns, Casing panels, Hoppers and slide bearings) and erection of new ESP components, including addition of 02 fields in series, thereby increasing the height & length of ESP.
- 2.2 The existing precipitator casing will be increased in height from 11.6 m to 15.0 m to accommodate taller fields. Also the casing will be extended horizontally to have seven fields in total.
- 2.3 The existing ESP internals and roof will be completely dismantled. However the existing supporting structures, hoppers and casing are retained.
- 2.4 Existing ducting system and gates from APH outlet to ESP inlet will be retained. Modified ESP inlet funnel will be connected to existing inlet duct as shown in the layout drawing.
- 2.5 The ESP outlet funnel and its ducting will be new one and connected to existing ID fan inlet duct. The existing gates at outlet duct will be re-used & will be relocated.
- 2.6 Existing ESP hoppers of first five fields will be retained and existing heaters will be replaced with thermostatically controlled electrical tubular type heating elements.

- 2.7 Existing handling arrangement for the transformer rectifier sets mounted on the precipitator roof will be reused and relocated.
- 2.8 Existing 3 numbers guillotine gate along with electrical actuator per boiler will be reused, one number at outlet duct of each ESP, one number at outlet interconnecting duct. Two (2) numbers new bi-plane dampers at ID fan inlet duct will be provided.

3.0 SCOPE OF SUPPLY OF ILLUMINATION SYSTEM

- 3.1 The scope of supply of illumination system shall be in the contractors scope and as per the schedule of rates & quantities.
- 3.2 The make of Illumination system shall be PHILIPS / BAJAJ / WIPRO only.
- 3.3 The details and make of components for SLDB, MLDB etc. are given the Data sheet / specification ref. no. NSPCL : ILL: REV01.
- 3.4 The scope of supply includes secure packing and delivery at BHEL stores / storage yard at NSPCL, Rourkela site, i.e., F.O.R NSPCL site, Rourkela. Consignee shall be BHEL and delivery documents will be sent by BHEL in favour of their Client / Customer.
- 3.5 Products with I.S.I certification marks will be preferred.
- 3.6 Latest catalogues covering the items in quote shall be provided to BHEL.
- 3.7 Test Certificates, Operating and maintenance manuals as called for in the technical specification, in the required number of copies shall be provided to BHEL at no extra cost.

4.0 BRIEF SCOPE OF SUPPLY

- 4.1 The scope of supply of new electrical components by BHEL for retrofitting of ESP will include, but not limited, to the following.
- 4.2 Two numbers (02 per Unit) of 6.6 KV /0.415 kV outdoor service transformer of rating 1000 KVA for providing power to existing modified ESP. The two service transformers shall be hooked to one number new LTMSB through bus duct.
- 4.3 One number (01 per Unit) LTMSB (LT main Switch board), draw out & double front type for supplying power to EC panels of existing modified ESP. This will be housed in the new additional control room non-A/C area. The new LTMSB shall have two incomer circuit breaker and one bus coupler.
- 4.4 One numbers (01 per Unit) of ACP (Auxiliary Control Panel) of Double front, draw out type with single incomer for catering to power and control circuit of rapping motors, hopper heaters and insulator heaters.
- 4.5 High voltage Disconnecting Switches between the transformer rectifier and the high voltage emitting system complete.

- 4.6 Fourteen numbers (14 per Unit) of mineral oil immersed High Voltage Rectifier (HVR) Transformer rectifier units (95 KV, 600 mA).
- 4.7 Microcontroller based Precipitator Controller (ARECA) housed in the electronic control cubicles (Electronic control panels -ECP). The EC panels will be housed in the existing control room A/C area.
- 4.8 Heating elements of tubular type for the hoppers, support insulators and shaft insulators complete with thermostats.
- 4.9 Ash level indicator (Radio frequency type) for high and low level, for old hoppers and new hoppers.
- 4.10 Two numbers (02 nos. per Unit) of opacity monitor, one number at the outlet duct of each ID fan near to chimney shall be provided for continuous dust monitoring.
- 4.11 Interlock system consisting of key exchange boxes and interlocks for personnel protection arranged so that access to any high voltage equipment is prevented until the high voltage system is de-energised and grounded.
- 4.12 All the power and control cables of (XLPE insulated for power cable, FRLS PVC insulated for control cable), unarmoured type, between LTMSB and ACP and the electrical equipment of the precipitator.
- 4.13 HT cable between 6.6 KV power supply board and new service transformer 6.6 KV, XLPE insulated, unarmoured and their terminations at both end.
- 4.14 Ladder type trays.
- 4.15 Flexible cable tray supports.
- 4.16 Earthing materials.
- 4.17 One set (01 per Unit) of PC based Precipitator Integrated Operating System (IOS) to enable UCB operator to access the ESP for control, monitoring and data acquisition functions. The IOS-PC, Data logger PC and Printer will be kept at the UCB. This IOS (for each Boiler) consists of
- 1 number of PC (IOS-PC),
 - 1 number of PC based data logger,
 - 1 number printer
 - 1 set of microcontroller based Rapper controller (Intellirap).
 - 1 set of STATCON
- 4.18 One number (01 per Unit) IOS Panel to house Intellirap controllers, which will be at ESP control room.
- 4.19 Flexible Cable tray supports.
- 4.20 Structural steel materials (angles, channels etc) for fabrication of supports for cable trays, junction boxes, panels etc,
- 4.21 Air Conditioning system (Blower etc.) for new ESP control room

5.0 DISMANTLING SCOPE OF WORK

- 5.1 The scope dismantling of existing electrical components of ESP will include, but not limited, to the following.
- 5.2 Main Power Distribution Board / Auxiliary Control panel (ACP) in existing ESP control room.
- 5.3 Electronic Control panels (ECP).
- 5.4 Cables to High voltage Rectifier Transformer (HVR)
- 5.5 Cables for Heaters, Raping motors, Ash level indicators etc.
- 5.6 Cable trays on Outer Roof of ESP.
- 5.7 All junction boxes.
- 5.8 Illumination on outer roof and Collecting Rapping platform.
- 5.9 Fire proof Cable entry sealing arrangement.

6.0 SCOPE OF REUSE OF EXISTING MATERIALS / AREA.

- 6.1 The scope reuse of existing electrical components of ESP will include, but not limited, to the following. These materials shall be identified / tagged and stored safely for reuse.
- 6.2 Illumination system in Collecting Rapping platform.
- 6.3 Cable trays from existing Control Room to ESP.
- 6.4 Cable trays in hopper, Collecting Rapping area etc.
- 6.5 Earthing materials.
- 6.6 Existing control room will be used for accommodating the new ECP.

7.0 EXCLUSIONS

- 7.1 Dismantling of existing 10 number transformer rectifier (HVR) of capacity 80 KV(peak) and 400 mA(mean). These will be dismantled by BHEL / Other agency.
 - 7.2 Erection of new HVR transformer. These will be erected by BHEL / Other agency, but testing is in the scope of electrical works.
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APPENDIX - I**LIST OF MAJOR TOOLS & TACKLES , TESTING & MEASUREING INSTRUMENTS/ TOOLS AND TRACKLES TO BE ARRANGED/BROUGHT BY CONTRACTOR.**

This is only an indicative list. All the tools & tackles, equipment, instruments, test kits etc. required for completion of the work shall be arranged by the contractor. **All safety equipment required for this work shall be arranged by the contractor. All safety regulations of BHEL/their client M/s.NSPCL must be followed by the contractor during the erection work.**

SL.NO.	Description
I. INSTRUMENTS , TEST KITS AND EQUIPMENT	
01	Primary Injection Kits
02	Secondary Injection Kits
03	Motorised Megger (2.5/5 KV)
04	Micro ohm Meters
05	HV Test Kit
06	Digital Multimeters (31/2/4 ½ Digit)
07	Insulation tester hand operated 250V/500V/1000V rated mains/battery operated (Megger).
08	Tong testers
09	Industrial type vacuum cleaner
10	Transformer Oil Filtration Machine and BDV Test Kit
II. HANDLING EQUIPMENT	
01	Turn buckles
02	D-Shackles
03	Steel wire ropes
04	Manila ropes
05	Chain pulley blocks
06	Mobile Crane (10 MT)
III. MAJOR T&P	
01	Grinding machine and Drilling machine ¼”,1/2”,3/4” and 1”.
02	Sprit level.
03	Tap sets for both BSP and NPT threads upto 1” each
04	Mechanical tool kit for fitters.
05	Electrical tool kits including spanners, Allen keys etc.
06	Cutting tools
07	Flood light fittings.
08	Distribution boards with power cable as required.
09	Painting brush.
10	Safety belts and safety helmets.
11	Ferrule printing machine.
12	Electrode drying ovens.
13	Gas cutting set
14	Welding Generators / T/F

GENERAL CONDITIONS OF CONTRACT

FOR

WORKS

(SECTION – I & II)

ES : F : 010



ERECTION SERVICES DEPARTMENT

BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

BOILER AUXILIARIES PLANT

INDIRA GANDHI INDUSTRIAL COMPLEX

RANIPET – 632 406

BHARAT HEAVY ELECTRICALS LIMITED
BOILER AUXILIARIES PLANT
RANIPET 632 406
GENERAL CONDITIONS OF CONTRACT FOR WORKS IN ERECTION SERVICES DEPARTMENT OF
BHARAT HEAVY ELECTRICALS LIMITED (RANIPET)

SECTION -I

1. GENERAL INSTRUCTIONS TO BIDDERS

1.1. DESPATCH INSTRUCTIONS:

- 1.1.1.** This tender specification as a whole, duly furnishing all the details required and other documents as required in the following pages, shall be duly signed and sent in a sealed cover duly super scribing the name of work as given in the tender notice.
- 1.1.2.** The tender shall be addressed to Officer inviting tender as indicated in the tender notice.
- 1.1.3.** Tenders submitted by post shall be sent by “REGISTERED POST WITH ACKNOWLEDGEMENT DUE “and shall be posted with the due allowance for any postal delay. The tenders received after the due date and time of opening are liable to be rejected. Telegraphic offers and offers received by telex may not be considered.
- 1.1.4.** Tenders shall be opened by authorized officer of BHEL at his office at the time and date as specified in the tender notice in the presence of such of those bidders or their authorized representatives who may be present.
- 1.1.5.** The Tenders shall closely pursue all the clauses, specifications and drawings indicated in the tender documents before quoting. Should the bidder have any doubt in the meanings of any portion of the tender specification or find discrepancies or omission in the drawings or the tender documents issued are in complete or shall require clarification on any of the technical aspect, scope of work etc., he shall at once contact the authority inviting the tender for clarification before the submission of the tender.
- 1.1.6.** Before tendering, the bidders are advised to inspect the site of work and the environments and be well acquainted with the actual working and other prevalent conditions, facilities available, position of material and labour. No claim will be entertained later, on the ground of lack of knowledge.
- 1.1.7.** Bidder must fill up all the schedules and furnish all the required information as per the instructions given in various sections of the tender specification. Each and every page of the Tender Specification must be signed and submitted along with the offers by the bidder in token of complete acceptance thereof. The information furnished shall be complete by itself.
- 1.1.8.** The bidders shall quote the rates in English language and international numerals. These rates shall be entered in figures as well as in words.
- 1.1.9. Discrepancy in Quoted Rates :**
- a. If, in the price structure quoted, there is a discrepancy between the Unit rate quoted and the Total Price (which is obtained by multiplying the unit price by the quantity) due to arithmetical errors, the Unit rate quoted will be considered valid and the Total price will be corrected accordingly, unless in the opinion of BHEL there is an obvious misplacement of decimal point in the unit price. In which case the total price as quoted shall govern and the unit price corrected accordingly.
 - b. If there is an error in total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.
 - c. If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

- d. If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date before which the bidder has to send their acceptance on the above lines. If the bidder does not agree to the decision of BHEL, the bid is liable to be ignored.

1.1.10. For the purpose of the tender, the metric system of units shall be used.

1.1.11. All entries in the tender shall either be typed or be written in ink. Erasers and overwriting are not permitted and may render such tenders liable to summary rejection. All cancellations and insertions shall be duly attested by the bidder.

1.2. QUALIFICATION OF BIDDERS:

Only bidders who have previous experience in the work of this nature and description detailed in this tender specification are expected to quote for this work duly submitting details of experience along with the offer. Offers from bidders who do not have proven and established experience in the field are not likely to be considered.

1.3. DATA TO BE ENCLOSED:

Full information shall be given by the bidder in respect of the following. Non-submission of these information may lead to rejection of the offer.

1.3.1. FINANCIAL STATUS:

A certificate from Scheduled Bank to prove his financial capacity to undertake the work duly indicating financial limits the bidder enjoys or solvency certificate from the concerned Government authority. Information required in Annexure A shall be furnished by the bidder along with the offer.

1.3.2. INCOME TAX CERTIFICATE:

A certificate of Income Tax clearance from the appropriate authority in the forms prescribed there for indicating annual turnover and the Sales Tax clearance certificate from the appropriate authorities as prescribed by the concerned state government, if any. These certificates shall be valid for one year from the date of issue or for the period prescribed therein for all tenders submitted during the period.

1.3.3. PREVIOUS EXPERIENCE:

A statement giving particulars duly supported by documentary evidence of the various services rendered for each similar work by the bidder indicating the particulars, value of each work, the site location, the duration, date of completion, a list of site locations and particulars and value of various services that are under progress. Information required in Annexure –BI & BII shall be furnished by the bidders along with the offer.

1.3.4. ORGANISATION CHART:

The Organisation pattern that is presently available with the bidder and that will be employed by the bidder for this work shall be furnished.

1.3.5. An attested copy of the Power of Attorney, in case the tender is signed by an individual other than the sole proprietor, shall also be attached. (If it is a Company or Firm, etc., Director/Managing Partner as the case may be is required to sign)

1.3.6. IN CASE OF AN INDIVIDUAL:

His full name, address and place and nature of business shall be indicated.

1.3.7. IN CASE OF PARTNERSHIP FIRMS:

The names of all the partners and their addresses be furnished along with a copy of the partnership deed/instrument of partnership duly certified by Notary Public shall be enclosed.

1.3.8. IN CASE OF COMPANIES:

Date and place of registration including date of commencement certificate in case of public companies (certified copies of Memorandum and Articles of Association are also to be furnished) are to be furnished.

1.3.9. Nature of business carried on by the Company and the provisions of the Memorandum relating there of shall be furnished.

1.3.10 Names and particulars including addresses of the Directors and their previous experiences shall be furnished.

1.3.11 A list of tools and tackles that the bidder is having and those that will be used on this job shall be furnished.

1.3.12 In addition to the above, the particulars required in various annexure shall also be furnished.

1.4. EARNEST MONEY DEPOSIT:

1.4.1. Every tender must be accompanied by the prescribed amount of Earnest Money Deposit in any one of the following forms.

1.4.1.1.EMD shall be deposited in cash (as permissible under income tax act), Payorder or Demand Draft (payable at Ranipet in favour of “Bharat Heavy Electricals Ltd.,”) only. No other form of EMD remittance shall be acceptable to BHEL.

1.4.1.2.In case of payment of EMD in the form of Cash, the amount should be remitted by the bidder to the Cash Office of Bharat Heavy Electricals Limited, BAP,Ranipet-632 406 during it's working hours and cash receipt issued shall be enclosed along with the tender.

1.4.2. Tenders received without Earnest Money in full in the manner prescribed above are liable to be rejected.

1.4.3. The Earnest Money Deposit of the successful tenders may be retained towards part of Security Deposit.

1.4.4. In the case of unsuccessful bidders, the Earnest Money will be refunded to them within a reasonable time after finalisation of the tender.

1.4.5. Earnest Money Deposit by the bidder will be forfeited as per tender documents if the bidder:

1.4.5.1.Fails to communicate unqualified acceptance of Letter of Intent within 15 days of date of Letter of Intent.

1.4.5.2.Does not commence the work within the period as per LOI/Contract. In case the LOI/Contract is silent in this regard then within fifteen days after award of contract.

1.4.5.3.After opening of Tender, revokes/withdraws his tender within the validity period or revises/alters his earlier quoted rates/conditions.

1.4.5.4.Fails to submit SD as indicated in the Letter of Intent.

1.4.6. Earnest Money deposit shall not carry any interest.

1.5. AUTHORISATION AND ATTESTATION:

1.5.1. Tenders shall be signed by persons duly authorized /empowered to do so. Certified copies of such authority and relevant documents shall be submitted along with the tenders.

1.6. VALIDITY OF OFFER:

The rates in the Tender shall be kept open for acceptance for a minimum period of six months from the date of opening of tenders. In case the Bharat Heavy Electricals Limited calls for negotiations such negotiations shall not amount to cancellation or withdrawal of the original offer , which shall be binding on the bidders.

1.7. EXECUTION OF CONTRACT:

The successful bidder's responsibility under this contract commences from the date of issue of the Letter of Intent by Bharat Heavy Electricals Limited. The successful bidder shall be required to execute an agreement in the prescribed form (Annexure-D) with BHEL within a reasonable time after the acceptance of his tender and in any case before submitting the first bill for payment. The expenses for completion, stamping and registration of the agreement with prescribed authority, if necessary, shall be borne by the Contractor.

1.8. SECURITY DEPOSIT:

1.8.1. Upon acceptance of tender, the successful bidder within the time specified in the letter of intent must deposit the required amount of Security Deposit for satisfactory execution of work and shall not commence work under this contract before remitting security deposit except as directed by BHEL.

1.8.2. The total amount of Security Deposit shall be as follows:

1.8.2.1. In the case of work costing up to Rs.10 lakhs – 10% of the quoted value.

1.8.2.2. In the case of work costing Rs.10 lakhs to Rs.50 lakhs – Rs.1 lakh plus 7.5% of the amount exceeding Rs.10 Lakhs.

1.8.2.3. In the case of work costing more than Rs.50 Lakhs – Rs.4 lakhs plus 5% of the amount exceeding Rs.50 Lakhs.

1.8.3. The Security Deposit may be furnished in any one of the following forms:-

1.8.3.1. Cash (as permissible under the income tax act).

1.8.3.2. Payorder , Demand Draft in favour of BHEL.

1.8.3.3. Local cheques of Scheduled Banks, subject to realization.

1.8.3.4. Securities available from Post Offices such as National saving Certificates, Kisan Vikas Patras etc. (Certificates should be held in the name of contractor furnishing the security and duly pledged in favour of BHEL and discharged on the back).

1.8.3.5. Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the companies act. The Bank Guarantee format should have the approval of BHEL (Annexure-E). The Bank Guarantee furnished towards Security Deposit should be kept valid by proper renewal till the expiry of 6 Months after the said work is actually completed.

1.8.3.6. Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the companies act. The FDR should be in the name of the contractor, account BHEL, duly discharged on the back.

1.8.3.7. Security deposit can also be recovered at the rate of 10% from the running bills. However in such cases atleast 50% of the security deposit (as Bank Guarantee or Demand Draft) should be remitted before start of the work and balance 50% may be recovered from the running bills till the full Security Deposit is made up.

1.8.3.8. EMD of the successful bidder may be converted and adjusted against the security deposit on specific request by the contractor.

1.8.3.9. Acceptance of security deposit as per clause 1.8.3.4 and 1.8.3.6 above will be subject to hypothecation or endorsement on the documents in favour of BHEL. However, BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith.

1.8.4. If the value of the work done at any time exceeds the accepted agreement value, the security Deposit shall be correspondingly enhanced and the extra Security Deposit shall be immediately deposited by the Contractor or recovered from payments due to him.

1.8.5 Failure to deposit the Security Deposit within the stipulated time, may lead to forfeiture of Earnest Money and cancellation of the award of work.

1.8.6 If any part of Security Deposit of the Contractor is held in the form of approved securities it shall be kept transferred in the name of Bharat Heavy Electricals Limited, Ranipet, in such a manner that the same can be realized fully without referring to the Contractor, BHEL shall not be responsible for any depreciation in the value of the Security while in BHEL's custody or for any loss of interest thereon.

1.8.7 BHEL reserves the right to forfeiture of Security Deposit in addition to the other claims and penalties in the event of the Contractor's failure to fulfill any of the Contractual obligation including liquidation or bankruptcy of the contractor, non-payment of money payable by means of arbitration award in favour of BHEL or in the event of termination of Contract as per terms and conditions of Contract. BHEL reserves the right to set off the Security Deposit, against any claims of any other contracts with BHEL.

1.8.8 RETURN OF SECURITY DEPOSIT:

If the Contractor performs and completes the work in all respects to the entire satisfaction of BHEL and presents an absolute "No Demand Certificate" in the prescribed form (Annexure-F) and returns properties belonging to BHEL handed over, lent or hired by him for carrying out the said works, Security Deposit will be released to the Contractor after deducting all cost of expenses or other amounts that are to be paid to BHEL under this or other contracts entered into with the Contractor. **It may be noted that in no case the Security Deposit shall be refunded/released prior to passing of final bill.**

1.9. REJECTION OF TENDER AND OTHER CONDITIONS

1.9.1. The acceptance of Tender will rest solely with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights for the following without assigning any reasons whatsoever.

1.9.1.1. To reject any or all of the bidders.

1.9.1.2. To split up the work amongst two or more Bidders.

1.9.1.3. To award the work in part.

1.9.1.4. Either of the contingencies stated in (1.9.1.2) and (1.9.1.3) above to modify the time for completion suitably.

1.9.2. Conditional and Unwitnessed tenders, tenders containing absurd or unworkable rates and amounts and tenders which are incomplete and otherwise considered defective and tenders not in accordance with the tender conditions, specifications, etc., are liable to be rejected.

1.9.3. If a bidder expires after the submission of his/her tender or after the acceptance of his/her tender, BHEL may at their discretion cancel such tender. If a partner of a firm expires the submission of the tender or after the acceptance of the tender, BHEL may cancel such tender at their discretion unless the firm retains its character.

1.9.4. BHEL will not be bound by any power of Attorney granted by the bidder or by changes in the composition of the firm made subsequent to the execution of the Contract. They may, however recognize such power of Attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.

1.9.5. If the bidder deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or cancel the contract, if awarded. The Earnest Money/Security Deposit /any other money due shall also be forfeited.

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

1.9.7. Should a bidder or contractor or in the case of a firm or company of contractors one or more of its partners/share holders/Directors have a relation or relations employed in BHEL, the

authority inviting tender shall be informed of the fact along with the offer, failing this BHEL may, at its sole discretion reject the tender or cancel the contract and forfeit the Earnest Money/Security Deposit.

- 1.9.8.** The successful bidder should not sub-contract the part or complete work detailed in the tender specification undertaken by him without written permission of BHEL. The bidder is solely responsible to BHEL for the work awarded to him.
- 1.9.9.** No deviation from the tender specification shall be acceptable to BHEL. Bidders shall confirm their unqualified acceptance of the terms and conditions by giving an undertaking to this effect in a separate letter as specified by BHEL.
- 1.10. NO INTEREST shall be payable by BHEL on Earnest Money or Security Deposit, if applicable, or any money due to the Contractor by BHEL.**

SECTION –II

2.1. DEFINITION:

The following terms shall have the meaning hereby assigned to them except where the context otherwise requires.

- 2.1.1. BHEL or (B.H.E.L Ltd)** shall mean Bharat Heavy Electricals Limited a Company registered under Indian Companies Act 1956, with its Registered Office at BHEL House, Siri fort, New Delhi 110 049 or its Authorised Officers or its Resident Engineer or other employees authorized to deal with any matters with which these persons are concerned on its behalf.
- 2.1.2. “GENERAL MANAGER”**
shall mean the Officer in Administrative charges of contracting unit of BHEL.
- 2.1.3. “ENGINEER” or “ENGINEER IN CHARGE”** shall mean Engineer who is in-charge for the works referred in Erection Services. The term also includes PROJECT MANAGER, “RESIDENT MANAGER” “SITE ENGINEER “ “ RESIDENT MANAGER” and “ASSISTANT SITE ENGINEER “ of BHEL at the site as well as the Officers in-charge at Head Office.
- 2.1.4. “SITE”** shall mean the place or places at which the plants/equipments are to be erected and services are to be performed as per the specification of this contract.
- 2.1.5. “CLIENTS OF BHEL” or “CUSTOMER”** shall mean the project authorities to whom BHEL is supplying the equipments.
- 2.1.6. “CONTRACTOR”** shall mean the individual, firm or company who enters in to this contract with BHEL and shall include their executors, administrators, successor and permitted assignees.
- 2.1.7. “CONTRACT” or “CONTRACT DOCUMENT”** shall mean/and include the agreement or work order, the accepted appendices of rates, schedules, quantities, if any and general conditions of contract, the special conditions of contract, instructions to the bidders, the drawings, the technical specifications, the special specifications, if any, the tender documents and the Letter of Intent/Acceptance Letter issued by BHEL. Any conditions or terms stipulated by the contractor in the tender document or subsequent letters shall not form part of the contract unless specially accepted in writing by BHEL, in the Letter of intent and incorporated in the agreement.
- 2.1.8. “GENERAL AND SPECIAL CONDITIONS OF CONTRACT”** shall mean the “Instructions to Bidders and General and Special Conditions of Contract” pertaining to the work for which the bidders are called for.
- 2.1.9. “TENDER SPECIFICATIONS”** shall mean the “SPECIFIC CONDITIONS, Technical specifications, appendices, site informations and drawings” pertaining to the work in which the bidders are required to submit their offer, Individual specification number will be assigned to each tender specification..
- 2.1.10. “TENDER DOCUMENTS”** shall mean the General and Special Conditions of Contract(2.1.8) and tender specification(2.1.9).
- 2.1.11. “LETTER OF INTENT”** shall mean the intimation by a letter to the bidder that the tender has been accepted in accordance with provisions contained in that letter. The responsibility of the contractor commences from the date of issue of this letter and all the terms and conditions of contract are applicable from this date.
- 2.1.12. “COMPLETION TIME”** Shall mean the period by date specified in the acceptance of tender or date mutually agreed upon for handing over of the erected equipment/plant which are found acceptable by the Engineer being of required standard and conforming to the specifications of the contract.

- 2.1.13. “PLANT”** shall mean and cannot the entire assembly of the plant and equipments covered by the contract.
- 2.1.14. “EQUIPMENT”** shall mean all equipments, machinery, materials, structurals, electricals and other components of the plant covered by the contract.
- 2.1.15. “TESTS”** shall mean and include such test or tests to be carried out on the part of the contractor as are prescribed in the contract or considered necessary by BHEL in order to ascertain the quality, workmanship, performance and efficiency of the contract work or part thereof.
- 2.1.16. “APPROVED” “DIRECTED” or “INSTRUCTED”** shall mean approved, directed or instructed by BHEL.
- 2.1.17. “WORK OR CONTRACT WORK”** shall mean and include supply of all categories of labour specified consumables, tools and tackles required for complete and satisfactory site transportation handling, stocking, storing, erecting, testing, and commissioning of the equipments to the entire satisfaction of BHEL.
- 2.1.18. “SINGULAR AND PLURAL ETC”** works carrying singular number shall also include plural and vice versa, where the context so required. Words importing the masculine gender shall be taken to include the feminine gender and words imparting persons shall include any company or association or body of individuals, whether incorporated or not.
- 2.1.19. “HEADINGS”**
- The headings in these general conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
- 2.1.20. “MONTH”** shall mean calender month, unless specified otherwise in the tender.
- 2.1.21. “WRITING”** shall include any manuscript typewritten or printed statement under the signature of BHEL.
- 2.2. LAW GOVERNING THE CONTRACT AND COURT JURISDICTION**
- The contract shall be governed by the Law for the time being in force in the Republic of India, and shall be subject to the Jurisdiction of the courts having Jurisdiction over RANIPET (VELLORE Dist, Tamil Nadu).
- 2.3. ISSUE OF NOTICE:**
- The Contractor shall furnish to the BHEL ENGINEER the name, designation and address of his authorized agent and all complaints, notices, communication and reference shall be deemed to have been duly given to the contractor or his authorized agent or left or posted to the address of either the contractor or of his representative and shall be deemed to have been so give in the case of posting on the day on which they would have reached such address in the ordinary course of post or on which they were so delivered of / or left.
- 2.4. USE OF LAND:**
- No land belonging to BHEL or their customer under temporary possession of BHEL shall be occupied by the Contractor without the written permission of BHEL.
- 2.5. COMMENCEMENT OF WORKS:**
- 2.5.1.** The Contractor shall commence the works within the time indicated in the Letter of Intent from BHEL and shall proceed with the same with due expedition without delay.
- 2.5.2.** If the successful bidder fails to start the work within the stipulated time, BHEL, at his sole discretion will have the right to cancel the contract. His earnest money and/or Security Deposit with BHEL will stand forfeited without any further reference to him without prejudice to any and all of BHEL’s other rights and remedies in this regard.

- 2.5.3.** All the works shall be carried out under the direction and to the satisfaction of BHEL.
- 2.5.4.** The erected/constructed plant or work performed under this contract shall be taken over when it has been completed in all respects and/or satisfactorily put in to operation at site.
- 2.6. MODE OF PAYMENT AND MEASUREMENT OF THE WORK COMPLETED:**
- 2.6.1.** All payments due to the contract shall be paid through E-PAYMENT (EFT / RTGS) only. The contractor has to furnish acceptance for e-payment, duly indicating the bank account details in the prescribed format.
- 2.6.2.** For Progress running bill payment:
The contractor shall present detailed measurement working sheets, in quadruplicate, duly indicating all relevant details based on technical documents and connected drawings for work done during the month/period under various categories in line with terms of payment as per letter of intent. The basis of arriving at the quantities/weight shall be the relevant documents and drawings released by BHEL.
- 2.6.3.** These measurement working sheets will be checked and vetted by BHEL Engineers and quantities and percentage eligible for payment under various groups shall be decided by BHEL engineers. The abstract of quantities and percentage so arrived based on the terms of payment shall be entered in Measurement Book and signed by both the parties.
- 2.6.4.** Based on the above quantity, contractor shall prepare the bills in prescribed proforma and work out the financial value. These will be entered in Measurement Book and signed by both the parties and paid duly effecting recoveries due.
- 2.6.5.** All recoveries due from the contractor for the month/period shall be effected in full from the corresponding running bills unless specific approval from the competent authorities is obtained otherwise.
- 2.6.6.** Measurement shall be restricted to that for which it is required to ascertain the financial liability of BHEL under this contract.
- 2.6.7.** The measurement shall be taken jointly by persons duly authorized on the part of BHEL and by the contractor.
- 2.6.8.** The contractor shall bear the expenditure involved, if any, in making the measurement. The contractor shall, without extra charges provide all the assistance with appliances and other things necessary for measurement.
- 2.6.9.** If, at any time due to any reason, whatsoever, it becomes necessary to re-measure the work done in full or in part, the expenses towards such re-measurements shall be borne by the contractor.
- 2.6.10.** Passing of measurement as per bills does not amount to acceptance of the completion of the work mentioned. Any left out work has to be completed if pointed out at a later date by BHEL.
- 2.6.11.** Final measurement bill shall be prepared in the final bill proforma prescribed for the purpose based on the certificate issued by BHEL Engineer that entire work as stipulated in the tender specification has been completed in all respects to the entire satisfaction of BHEL. Contractors shall give unqualified 'No Due' and 'No Demand' certificate. All the tools and tackles loaned to them should be returned in condition satisfactory to BHEL. Quantities/Weight erected shall be prepared and paid, within a reasonable time after completion of work. After payment of final bill, only guarantee obligation percentage shall remain unpaid which shall be released in accordance with clause 2.13. The final bill quantities and financial value shall also be entered in Measurement Book and signed by both the parties to the contract.

2.7 RIGHTS OF BHEL

BHEL reserves the following rights in respect of this contract without entitling the contractor for any compensation.

- 2.7.1.** To get the work done through other agency at the risk and cost of the Contractor, in the event of Contractor's poor progress, or inability to progress the work, persistent disregard in instruction of BHEL, assignment transfer, subletting of the contract without permission of BHEL, non fulfillment of any contractual obligation etc., and to recover compensation for such losses from the contractor including BHEL's supervision charges and overheads from Security Deposit / other dues.
- 2.7.2.** To withdraw any portion of work and/or to restrict/alter quantum of work as indicated and get it done through other agency and/or with departmental labour to suit BHEL's commitment to its customer or in case BHEL decides to advance the date of completion due to other emergency reasons/BHEL's obligation to its customer.
- 2.7.3.** To terminate the contract after due notice to cause forfeiting of Security Deposit and recover the loss sustained in getting the balance work done through other agencies in addition to liquidated damages in the event of :
 - 2.7.3.1.** Contractor's continued poor progress.
 - 2.7.3.2.** Withdrawal from or abandonment of the work before completion of the work.
 - 2.7.3.3.** Corrupt act of contractor.
 - 2.7.3.4.** Insolvency of the contractor.
 - 2.7.3.5.** Persistent disregards to the instructions of BHEL.
 - 2.7.3.6.** Assignment transfer, sub-letting of the contract without BHEL's permission.
 - 2.7.3.7.** Non-fulfillment of any contractual obligations.
- 2.7.4.** To recover any money due from the contractor from any money due to the contractor under this contract or any other contract or from the Security Deposit.
- 2.7.5.** To claim compensation for losses sustained including BHEL's supervision charges and overheads for completion on termination of contract and to impose penalty for delay in completion of the work at the rate of ½% of the contract value per week of delay or part thereof subject to a ceiling of 10% of contract value.
- 2.7.6.** To terminate the contract or to restrict the quantum of work and pay for the portion of work executed in case BHEL's contracts with their customers are terminated for any reason.
- 2.7.7.** To effect recovery from any amount due to the contractor under this or any other contractor in any other form the moneys BHEL is forced to pay to anybody, due to contractor's failure to fulfill any of his obligation.
- 2.7.8.** To restrict or increase the quantity and nature of work to suit the site requirements since the tender specification is based on preliminary documents and quantities furnished there in are indicative and approximate and the rates quoted shall not be subject to revision.
- 2.7.9.** To deploy BHEL's fitters, welders, operators and technicians in case of emergency/poor progress/deficiency in skill on the part of employees of contractor and to recover the expenditure on account of the same from contractor's bills.
- 2.7.10.** While every endeavor will be made by BHEL they cannot guarantee un-interrupted work to the contractor due to conditions beyond their control. Contractor will not be entitled for any compensation extra payment on his account.
- 2.7.11.** In the event of any dispute of any nature, the decision of BHEL shall be final and binding on the contractor.

2.7.12. Cancellation of contract in part or full for contractor's default:

If the contractor:

- a) makes default in commencing the work within a reasonable time from the date of handing over of the site and continue in that state after a reasonable notice from Engineer-in-charge.

OR

- b) in the opinion of the Engineer-in-charge at any time whether before or after the date / extended date for completion, make default in proceeding with the work, with due diligence and continue in that state after a notice of seven days from Engineer-in-charge

OR

- c) fails to comply with any of the terms and conditions of the contract or after 7 days notice in writing with orders properly issued there under

OR

- d) fails to complete the work order and items of work as per individual dates for completion and clear the site on or before the date of completion or fails to achieve the progress set out in accordance with the provisions of contract.

The Accepting Officer may, without prejudice to any other right or remedy which shall have accrued or shall accrue to BHEL, cancel the contract as a whole or in part thereof or only such work order items of work in default from the contract. Whenever the Accepting officer exercises his authority to cancel the contract as a whole or in part under this condition he may complete the work at the contractor's risk and cost, provided always that in the event of the cost of completion (as certified by Engineer-in-charge, which is final and conclusive) being less than the contract cost the advantage shall accrue to the BHEL. If the cost of completion exceeds, the money due to the contractor under this contract the contractor shall either pay the excess amount ordered by General Manager or the same shall be recovered from the contractor by other means. Engineer-in-charge will have power to take possession of site and materials, constructional plant, implements, stores etc there on.

In case BHEL completes the work or any part thereof under the provisions of the contract conditions, then such completion is to be taken in to account in determining the excess cost to be charged to the contractor under this condition and shall consist of the cost of materials purchased and / or labour provided by BHEL, with an addition of such percentage to cover superintendence and establishment charges as may be decided by the General Manager, whose decision shall be final and conclusive.

- 2.7.13.** If the contractor fails to pay the excess sum within a period of 30 days the Engineer-in-charge shall have the right to sell any or of the contractor's unused materials, construction plant, implements, temporary buildings etc., and apply the proceeds of sale thereof towards the satisfaction of any sum due from the contractor under the contract and if there after be any balance out standing from the contractor, it shall be recovered in accordance with the provisions of the contract.

2.8. RESPONSIBILITIES OF THE CONTRACTOR IN RESPECT OF LOCAL LAWS, EMPLOYMENT OF WORKERS Etc.

The following are the responsibilities of the Contractor in respect of observation of local laws, employment of personnel, payment of taxes etc.

- 2.8.1.** As far as possible unskilled workers shall be engaged from the local areas in which the work is being executed.
- 2.8.2.** The contractor at all times during the continuance of this contract shall, in all his dealings with local labour for the time being employed on or in connection with the work, have due regard to all local festivals, religious and other customs.

- 2.8.3.** The contractor shall comply with all state and Central Laws, Statutory Rules, Regulations etc., inclusive of those regarding labour and industrial laws which are applicable from time to time and they shall comply with the provisions of the said labour legislations, rules and regulations framed under the provisions of Employees Provident Fund and Miscellaneous Provisions Act 1952 shall be strictly followed.
- 2.8.4.** The contractor shall pay all taxes, including sales Tax on works contract if any fees, license, charges, deposits duties, tool royalty commissions or other charges which may be leviable on account of any of his operations in execution of the contract in case BHEL is forced to pay any of such taxes. BHEL shall have the right to recover the same from the contractor either from his bills or other wise as deemed fit.
- 2.8.5.** While BHEL would pay the inspection fees, of the Boiler Inspectorate, all other arrangements for the visits periodically by Boiler Inspector to site, Inspection Certificate etc., will have to be made by the contractor. However BHEL will not make any payment to Boiler Inspector in connection with contractor's welders qualification/requalification tests etc.
- 2.8.6.** The contractor shall be responsible for provision of health and sanitary arrangements (more particularly described in Contract Labour Regulation & Abolition Act) safety precautions etc., as may be required for safe and satisfactory execution of the contract.
- 2.8.7.** The contractor shall be responsible for providing proper accommodation including adequate medical facilities for the personnel employed by him.
- 2.8.8.** The contractor shall be responsible for the proper behavior and observance of all regulations by the staff employed by him.
- 2.8.9.** The contractor shall ensure that no damage is caused to any person/property of other parties working at site. If any such damage is caused it is the responsibility of the contractor to make good the losses or compensate for the same.
- 2.8.10.** All the properties/equipments/components of BHEL their client loaned with or without deposit to the contractor in connection with contract shall remain the properties of BHEL/their client. The contractor shall use such properties for purpose of execution of this contract, all such properties/equipments/components shall be deemed to be in good condition when received by the Contractors unless he notifies within 48 hours to the contrary. The Contractor shall return them in good condition as and when required by BHEL/their client. In case of non-return, loss, damage, repairs etc, the cost thereof, as may be fixed by the site Engineer, will be recovered from the Contractor.
- 2.8.11.** It is not obligatory on the part of BHEL to supply any tools and tackles or other materials other than those specifically agreed to do so by BHEL. However, depending upon the availability/possibility BHEL's customer's handing equipment and other plants may be made available to the contractor on payment of the hire charges/free of charges, as fixed subject to the conditions laid down by BHEL/Customer from time to time. Unless paid in advance such hire charges if applicable shall be recovered from contractors bills/security deposit in one installment.
- 2.8.12.** The Contractor shall fully indemnify BHEL against all claims of whatsoever nature arising during the course of erection/construction/performing work under the contract.
- 2.8.13.** In case the Contractor is required to undertake any work outside the scope of this contract the rate payable shall be those mutually agreed upon.
- 2.8.14.** Any delay in completion of works/non-achievement of periodical targets, due to reasons attributable to the contractor, the same will have to be compensated by the Contractor either by increasing manpower and resources or by working extra hours and/or by working more than one shift. All these are to be carried out by the contractor at no extra cost.
- 2.8.15.** The contractor shall arrange and co-ordinate his work in such a manner as to cause no hindrance to other agencies working in the same premises.

- 2.8.16.** All safety rules and codes applied by the client/BHEL at site shall be observed by the contractor without exception. The contractor shall be responsible for the safety of the equipment/material and works to be performed by him and shall maintain all light, fencing guards signs etc, or other protection necessary for the purpose. Contractor shall also take such additional precautions as may be indicated from time to time by the Engineer with a view prevent pilferage, accidents, fire hazards and due precautions shall be taken against fire hazards and atmospheric conditions. Suitable number of clerical staff, watch and ward, store keepers to take care of equipment, materials and construction tools and tackles shall be posted at site by the contractor till the completion of the work under this contract. The contractor shall arrange for such safety devices as are necessary for such type of work and carry out the requisite site tests of handling equipments, lifting tools, tackles, etc., as per prescribed standards and practices.
- 2.8.17.** The contractor will be directly responsible for payment of wages to his workmen. A pay roll sheet giving all the type payments given to the workers and duly signed by the contractor's representative should be furnished to BHEL Site office on or before 15th of every succeeding month.
- 2.8.18.** In case of any class of work for which there is no such specification as laid down in the contract, such work shall be carried out in accordance with the instructions and requirements of the Engineer.
- 2.8.19.** No levy of payment or charge made or imposed shall be impeached by reason of any clerical error or by reason of any mistake in the amount levied or demanded or charged.
- 2.8.20.** Also no idle labour charges will be admissible in the event of any stoppage caused in the work resulting contractor's labour being rendered idle due to any cause at any time.
- 2.8.21.** The contractor shall take all reasonable care to protect the materials and work till such time the plant/equipment has been taken over by BHEL/their client.
- 2.8.22.** Contractor shall not stop the work or abandon the site for whatsoever reason or dispute, excepting for force major conditions. All such problems/dispute, shall be separately discussed and settled without affecting the progress of work. Such stoppage or abandonment shall be treated as breach of contract and dealt with accordingly.

2.9. CONSEQUENCES OF CANCELLATION:

Whenever BHEL exercises its authority to terminate the contract/withdraw a portion of work under the clause 2.7 they may complete the work by any means. In the event of the cost of completion as certified by the site Engineer which is final and conclusive being less than the contract cost, the advantage shall accrue to BHEL and that if the cost of completion exceeds the moneys due to the contractor under the contract, the contractor shall either pay the excess amount ordered by BHEL or the same shall be recovered from the contractor by any other means. This will be in addition to the forfeiture of Security Deposit and recovery of liquidated damages as per the relevant clauses.

- 2.9.1.** In case BHEL completes the work under the provision of this condition, the cost of such completion to be taken into account in determining the excess cost to be charged to the contract under this condition, shall consist of materials purchased and/or labour provided by BHEL with an addition of such percentage to cover supervision and establishment charges as may be decided by BHEL.

2.10 INSURANCE:

- 2.10.1.** BHEL/their customer shall arrange for insuring the materials/properties of BHEL / customer covering the risks during transit, storage, erection and commissioning.
- 2.10.2.** It is sole responsibility of the contractor to insure his workmen against accidents and injury while at work as required by relevant Rules and to pay compensation, if any, to workmen as per workmen's Compensation Act. The work will be carried out in a protected area and all the

rules and regulations of the client/BHEL in the area of project which are in force from time to time will have to be followed by contractor.

- 2.10.3.** If due to negligence and/or non-observance of safety and other precautions, any accident/injury occurs to any other persons/public, the contractor shall have to pay necessary compensation and other expenses if so decided by the appropriate authorities.
- 2.10.4.** If due to contractor's carelessness's, negligence of non-observance of safety precautions damage to BHEL's /customer's property and personnel should occur and if BHEL is unable to recover in full cost from the insurance company, the same will be recovered from the contractor.
- 2.10.5.** It shall be the responsibility of the contractor to provide security arrangement for the equipment/ materials belonging to BHEL and handed over to the contractor for erection/transportation till the same are taken over by BHEL after erection/returned to BHEL stores.

2.11. STRIKES & LOCKOUTS:

- 2.11.1.** The contractor will be fully responsible for the entire dispute and other issues connected with his labour. In the event of the contract labour resorting to strike or the contract resorting to lock-out and if the strike or lock-out declared is not settled within a period of one month, BHEL, shall have the right to get the erection work executed employing its own labour or through any agencies or both and the cost so incurred by BHEL be deducted from the contractor's bills.
- 2.11.2.** For any purpose whatsoever the employees of the contractor shall not be deemed to be in the employment of BHEL.

2.12. FORCE MAJEURE:

- 2.12.1** The following shall amount to FORCE MAJEURE:

Act of God or of any Government, War, Sabotage, Riots, Civil commotion, Police action revolution, Flood, Fire, Cyclones, Earth quake and epidemic and other similar causes over which the contractor has no control.

- 2.12.2.** If the contractor suffers delay in the due execution of the contractual obligation due to delays caused by FORCE MAJEURE as defined above, the agreed time of completion of the job covered by this contract or the obligation of contractor shall be extended by a period of time equal to the period of delay provided that on the occurrence of any such contingency the contractor immediately reports to BHEL in writing the causes of delay and the contractor shall not be eligible for any compensation.

2.13. GUARANTEE:

Even though the work will be carried out under the supervision of BHEL Engineers the contractor will be responsible for the quality of the workmanship and shall guarantee the work done for a period of twelve months from the date of completion of work as certified by the Engineer for good workmanship and shall rectify free of cost all defects due to faulty erection, detected during the guarantee period starting from the date of the completion of rectification. In the event of the contractor failing to repair the defective works within the time specified by the Engineer, BHEL may proceed to undertake the repairs of such defective works at the contractor's risk and cost, without prejudice to any other rights and recover the same from Security Deposit/other dues or by other legal means.

2.14. ARBITRATION:

Except where otherwise provided for in the contract all questions and disputes relating to the meaning of the specifications, designs, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in anyway arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or

otherwise concerning the work or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to the sole arbitration of the General Manager of BHEL and if General Manager is unable or unwilling to act, to the sole arbitration of some other person appointed by the General Manager, willing to act as such arbitrator.

The cases referred to arbitration shall be other than those for which the decision of the Accepting Officer, or Engineer-in-charge as the case may be is expressed in the contract to be final and conclusive. There will be no objection if the arbitrator so appointed is an employee of BHEL and that he had to deal with the matters to which the contract relates and that in the course of his duties as such he had expressed views on all or any of the matters in dispute or difference.

The arbitrator to whom the matter is originally referred being transferred or vacating his office or being unable to act for any reason, such General Manager as aforesaid at the time of such transfer, vacation of office or inability to act shall appoint another person to act as an arbitrator in accordance with the terms of the contract. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

Subject as aforesaid the provision of the Arbitration and Conciliation Act 1996 or any statutory modification or reenactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this clause.

It is a term of the contract that the party involving arbitration shall specify the dispute or dispute to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute.

The arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties fixing the date of first hearing.

The arbitrator shall give a separate award in respect of each dispute or difference referred to him.

The venue of arbitration shall be such place as may be fixed by the Arbitrator in his sole discretion. The award of the Arbitrator shall be final conclusive and binding on all parties to this contracts.

In the event of disputes or differences arising between one public sector and a Government Department or between two public sector enterprises the above stipulations shall not apply, the provisions of BPE Office memorandum No.BPE/CL/001/76 MAN/2(1.10)76-BPE(GM-1)dated 1st January 1976 or its amendments for arbitration shall be applied.

ANNEXURE –‘D’

**BHARAT HEAVY ELECTRICALS LIMITED
(A GOVERNMENT OF INDIA UNDERTAKING)
BOILER AUXILIARIES PLANT
INDIRA GANDHI INDUSTRIAL COMPLEX
ERECTION SERVICES DEPARTMENT
RANIPET – 632 406**

CONTRACT AGREEMENT

AGREEMENT NO: BAP : ERN : BHE :

DATE:

Name of work :

Name of the contractor with full address :

Amount of tender accepted :

Letter of Intent No. :

Time allotted for completing the work :
(date of completion)

(Officer authorized to sign the agreement)

CONTRACTOR

CONTRACT AGREEMENT**AGREEMENT No: BAP: ERN : BHE :****DATE:**

This agreement made this day, _____ of _____ between the Bharat Heavy Electricals Limited, Ranipet having its Registered Office at 'BHEL House' , Siri Fort, New Delhi 110 049 (herein after called the FIRST PARTY) of one part and Messrs. _____ (herein after called the ("CONTRACTOR") of the SECOND PARTY.

2. WHEREAS the first party is desirous of executing the work of _____ more particularly described in the appendices including drawings and specifications attached herewith.

3. WHEREAS IN PURSUANCE of the said Contractor's Tender having been accepted, the first party has decided to give the above said work to Contractor, and WHEREAS the contract between the parties was concluded by virtue of a letter of intent issued by the First Party under reference. _____ Dt.

4. WHEREAS the said Contractor has agreed to do the aforesaid work of the first party subject to the conditions herein contained in the presents, instructions to bidders, general conditions and special conditions, schedules, appendices, letter of intent and specifications (hereinafter referred as the said contract schedule) at the approved rates (herein referred as the said contract rate).

5. AND WHEREAS the said contractor has furnished a Bank Guarantee for a sum of Rs. _____ Valid up to _____ towards initial 50% security Deposit and has further agreed for balance 50% Security Deposit being recovered at 10% of value of each running bill till the full Security Deposit is made up for the satisfactory completion and performance of the work and whereas the validity of the said Bank Guarantee has to be extended by the Contractor, if so required before for the balance period of contract period and in the event of his failure to do so, the contractor shall pay or accept recovery of this amount of Rs. _____ (Rupees _____ only), from the bills forthwith in one installment and it has further been agreed that the failure to extend the validity of Bank Guarantee or failure to pay the aforesaid amount the manner specified above shall constitute the breach of contract, and first party reserved the right to take easy legal action deemed fit for recovering the said sum of Rs. _____ (Rupees _____ only). This amount of Rs. _____ Will be refunded (and Bank Guarantee will be returned) to the Contractor on satisfactory completion of the work as specified in the Contract documents.

6. Now THESE PRESENTS WITNESS that in consideration of the said contract schedule and said contract rate as also of agreement of good and faithful services to be rendered and performed by the contractor in the execution of the said work, subject to the stipulation hereinafter expressed.

7. That the said contractor will perform the aforesaid work subject to the conditions contained in these presents, instructions to bidder, general and special conditions of contract and the contract documents attached herewith including the said schedules, specifications, appendices, letter of intent, drawings attached and also such other drawings and instructions as may from time to time be given by the first party. And that the said contractor shall be deemed to have carefully examined the specifications and conditions of contract, appendices, schedules, letter of intent , drawings etc., as aforesaid and also to have satisfied himself as to the nature and character of work to be executed.

8. That the said contractor shall carry out and complete the execution of the said work to the entire satisfaction of the Engineer within the agreed time schedule.

9. That the first party after proper scrutiny of the bills submitted by the said contractor will pay to him during progress of the said work, at said contract rates and agreed terms of payment, a sum as determined by the first party in respect of the work executed by the contractor.

10. That the contract shall come into force with retrospective effect from the date on which the letter accepting the tender (Letter of Intent) has been issued to the said contractor.

11. That whatever under this contract or otherwise, any sum of money shall be recoverable from or payable by the Contractor, the same may be deducted in the manner as set out in the conditions of contract as aforesaid.

12. That all charges on account of Octroi, terminal and sales-tax or other duties on materials obtained for the work shall be borne by the said contractor.

13. That is agreed between the parties that the non-exercise of any of the powers conferred on the authorities of the first party will not in any manner constitute waiver of the conditions thereto contained in these presents and the liability of the said contractor either of past or further compensation shall remain unaffected.

14. That the expression BHEL wherever occurring means THE BHARAT HEAVY ELECTRICALS LIMITED, RANIPET.

15. The contract is subject to RANIPET(TamilNadu) jurisdiction.

16. The document hereto attached viz. shall also form part of this agreement.

17. General Conditions of Contract attached to the Notice inviting tender shall form part of this contract in so far as any thing is not provided specifically in this agreement.

18. In witness hereof the parties have respectively set their signatures in the presence of :

WITNESSES:

(with full address)

1.

2.

**Signature of the Contractor (to be signed by a
Person holding valid power of Attorney of the Company)**

Date:

WITNESSES:

(with full address)

1.

2.

For and on behalf Bharat Heavy Elec.Ltd.

Date:

ANNEXURE 'E'

PROFORMA FOR SECURITY DEPOSIT

THIS DEED OF GUARANTEE made this day of _____ by Messrs. _____ (hereinafter called the Bank) in favour of Messers. BHARAT HEAVY ELECTRICALS LIMITED, RANIPET having its Registered Office at New Delhi(hereinafter called the Principal)

WHEREAS Messers. _____ (hereinafter called the Contractor) has entered in to a Contract with Bharat Heavy Electricals Ltd., Ranipet arising out of Letter of Intent No. _____ Dt. _____ addressed by the Principal to the Contractor(hereinafter called the said agreement) for

AND WHEREAS the said Agreement provides that the contractor shall pay a sum of Rs. _____ (Rupees _____ only) towards 50% of full Security Deposit to be made in the form and manner therein specified.

AND WHEREAS the Contractor have approached the Bank and at their request and in consideration of the agreement arrived at between the said contractor and the Bank, the Bank has agreed to give such guarantee as hereinafter mentioned to the Principal.

NOW, therefore, these present witness that we the Bank by the hand Mr. _____ its lawfully and duly constituted attorney, do hereby undertake to pay to the principal a sum of Rs. _____ (Rupees _____ only) without demur on demand being made by the principal and to keep the principal indemnified to the extent of Rs. _____ by virtue of this guarantee against any loss or damage caused to or suffered by the principal by reason of any breach by the aforesaid contract of any of the terms and or conditions, stipulations or undertakings of any one of them contained in the said Agreement and the tender documents attached thereto and for the payment of any money or moneys payable by the said contractor to the principal under the terms and conditions of the said Agreements(the decisions regarding the breach, loss damage or payment due being solely in the discretion of the Principal).

We further undertake to pay without demur the aforesaid amount in a lump sum on demand or such part thereof as the Principal may demand from time to time irrespective of the fact whether the said contractor admits or denies such claim or questions its correctness in any Court Tribunal or Arbitration Proceedings or before any authority. The aforesaid guarantee will remain in force and we shall be liable under the same irrespective of any concession or time being granted by the principal, to the Contractor in or fulfilling the said agreement between contractor and the principal and the guarantee will remain in full force irrespective of any change of terms, conditions or stipulation or any variation in the terms of the said agreement irrespective of whether notice of such change or/variation is given to us or not and claim to receive such notice of any change/and or variation of the terms and or variation of the terms and or/conditions of the said agreement is hereby specifically waived by us. Further we shall not be release from this guarantee by any forbearance of the exercise or non-exercise of any of the powers or rights under the said agreement by the principal against the contractor irrespective of whether notice of such forbearance enforcement or non-enforcement of any powers or rights, modifications or change made in the said agreement or concessions shown to contractor by the principal is given to us or not.

The guarantee herein contained shall not be determined or affected by the liquidation or winding up or insolvency of or change in the constitution of the contractor but shall in all respects and for all purposes be binding and operative until all payments of all moneys due or that may hereafter become due to the principal in respect of any liability or obligations of the contractor under the said agreement.

We, the Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the principal under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till the principal certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said contractor and accordingly discharges the guarantee subject to however that the principal shall have no rights under this guarantee after the expiry of six months from the date of completion of the contract (the date of completion shall be as certified by the Principal) unless this guarantee is extended by agreement.

Any claim or dispute arising under the terms of this contract shall only be enforced or settled in the Court having jurisdiction over RANIPET (VELLORE Dist, Tamil Nadu)

And lastly the Bank undertakes not to revoke this guarantee during its currency except with the previous consent of the principal in writing.

The bank hereby declares that it has power to issue this guarantee under that Bank's Memorandum and Articles of Association and the undersigned has power to do so on its behalf under the power of Attorney granted to him by the proper Authorities of the Bank.

Date:

(Name of the Bank & Place)

Seal:

DESIGNATION OF THE AUTHORISED

PERSON SIGNING THE GUARANTEE

ANNEXURE –‘F’**NO DEMAND CERTIFICATE**

- 1) Name of work :
- 2) Agreement Date :
- 3) I/We certify that
 - a) I/We have completed the above work to the entire satisfaction of BHEL.
 - b) I/We have handed over all the balance materials, components, tools and tackles, machinery and other equipment of BHEL.
 - c) I/We have received the final payment from BHEL for the above work.
 - d) I/We have no further demand whatsoever from BHEL.

I/We, therefore request you to refund to me/us the security deposit of Rs. (Rupees dt. for Rs. only) and the Bank guarantee No.: After deducting all cost of expenses or other amounts that are to be paid by me/us to BHEL under this contractor other contract entered into by me/us with BHEL.

**SIGNATURE OF THE
CONTRACTOR WITH SEAL**

Place:

Date:

- Witness**
- 1)
 - 2)
 - 3)

SPECIAL CONDITIONS OF CONTRACT

FOR

ELECTRICAL WORKS

BAP:ERN :ELE: SPN : ESP:01



ERECTION SERVICES DEPARTMENT
BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
BOILER AUXILIARIES PLANT
INDIRA GANDHI INDUSTRIAL COMPLEX
RANIPET – 632 406

SECTION - III**SPECIAL CONDITIONS OF CONTRACT FOR ELECTRICAL WORKS IN
ELECTROSTATIC PRECIPITATOR (ESP)****3.1 SCOPE OF WORK**

- 3.1.1 The work covered under this specification is of highly sophisticated nature requiring the best quality of workmanship, engineering and construction management. The contractor should ensure timely completion of work. The contractor must have adequate quantity of tools. Measuring instruments, calibrating equipment etc. in his possession. He must also have on his rolls adequately trained. Qualified and experienced engineers supervisory staff and skilled personnel. The manpower deployment identified by contractor should match requirement of sophistication involving microprocessor-based systems.
- 3.1.2 The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall co-operate with the personnel of other agencies. Co-ordinate his work with others and proceed in a manner that shall not delay or hinder the progress of work as whole.
- 3.1.3 All the work shall be carried out as per the instructions of BHEL engineer. BHEL engineer's decision regarding the correctness of the work and method of working shall be final and binding on the contractor.
- 3.1.4 The services, tests and support to be provided by the agency of the work mentioned in the various sections of this tender are indicative and not exhaustive, but not limited to these for the completion of the work in all respects.
- 3.1.5 Contractor shall erect, test and commission all the equipments, cabinets/panels, instruments and cabling etc. as per sequence prescribed by BHEL at site. The sequence of erection / commissioning methodology will be decided by the BHEL engineers depending upon the availability of materials/work fronts etc. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the methods of erection / commissioning adopted in erection / commissioning of similar jobs or for any reasons whatsoever.
- 3.1.6 The work to be carried out under the scope of this specification covers the complete work of loading at site stores/ storage yard, handling, transporting, unloading at location of erection, pre-assembly, erection, calibration (where specified), testing, air flushing, pre-commissioning tests, assistance for commissioning of systems, trial run of various auxiliaries, achieving various activities till handing over of the unit to BHEL's customer.
- 3.1.7 The work shall conform to dimensions and tolerances specified in various drawings that will be provided during the erection. If any portion of the work is found to be defective in workmanship or not conforming to drawings or other specifications the contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done departmentally or by engaging other agencies and recoveries will be effected from contractor's bills towards expenditure incurred including departmental charges.
- 3.1.8 The terminal points as decided by BHEL shall be final and binding on the contractor for deciding the scope of work and effecting payment for the work done.
- 3.1.9 All works such as cleaning, leveling aligning trial assembly, dismantling of certain equipments / components for checking and cleaning, fabrication of tubes and pipes as per general engineering practice and as per BHEL engineers instructions at site cutting weld depositing, grinding straightening, chamfering filling of cut outs/openings for mounting of console inserts modules/indicators/recorders, drilling of holes for gland entries, reaming, scrapping, dressing, fitting up etc. as may be applicable in such erection works are treated as incidentals to erection work and are necessary to complete the work satisfactorily shall be carried out by the contractor as part of the work.

- 3.1.10 House keeping in the erection and pre-assembly area is as important as the well-planned and orderly work. The access to site for inspection by BHEL and customer engineers and leading of the material shall be made available by the contractor at all times.
- 3.1.11 The shifting and re-shifting of erection materials tools and plants and clearance of restrictions filling of ditches undulation near ESP area is the responsibility of the contractor. Contractor should visit the site and acquaint himself with all restrictions and difficulties that he may encounter during erection/commissioning stages.
- 3.1.12 Detailed scope for various items of work is further elaborated in clauses herein under. The tests required to be carried out before commissioning of equipment and procedure to be adopted shall be decided in consultation with the BHEL. The decision of BHEL in this regard shall be final and binding on the contractor.
- 3.1.13 Electrostatic Precipitator shall have one or more flue gas passes and each pass comprises of rectifier transformer (silicon/mineral oil filled), auxiliary control panels, switch gear panels, electronic controller, LT main switch board and its bus duct, Drives for rapping/controlling/Gas damper screen, heating element for hoppers/shaft and supporting insulator housing, ash level indicator and ESP management system (software based) including computer interface and associated interlock and protection.

3.2 ERECTION OF SERVICE TRANSFORMER

- 3.2.1 The scope of work under this head is defined as below.
- 3.2.2 Transportation of transformer and accessories from BHEL site stores/ storage yard to the transformer foundations / plinth, assembly of loose supplied items, erection, testing & commissioning.
- 3.2.3 The transformer shall be handled in such a manner so that no jerk is transferred to the core, winding and internals of the transformer.
- 3.2.4 Placement of transformer on plinth, alignment with respect to the foundation and in line with lay out drawings.
- 3.2.5 Topping-up of Oil, Filtration of oil and testing for BDV.
- 3.2.6 All the accessories shall be assembled/mounted as per GA drawings and these should be thoroughly cleaned prior to installation.
- 3.2.7 The contractor shall arrange required testing equipments for carrying out electrical test like voltage ratio, vector group, magnetic balance, winding resistance measurements, BDV value of oil, insulation resistance etc. The contractor shall arrange oil sample testing for tests applicable at approved testing laboratory at his own cost including all incidental expense.
- 3.2.8 The contractor shall consult and finalise the required tests / procedure with BHEL prior to commencement of the work.

3.2.9 TESTING BEFORE COMMISSIONING SHALL INCLUDE THE FOLLOWING.

- 3.2.9.1 Measurement of Insulation resistance and winding resistance.
- 3.2.9.2 Conducting Ratio test, vector group test etc., as required/ instructed at site.
- 3.2.9.3 Filtration of transformer oil for at least one complete cycle.
- 3.2.9.4 Measuring BDV value of transformer oil and further filtration, if required.

3.3 INSTALLATION OF ELECTRICAL PANELS

- 3.3.1 ESP Switch Gear panels (SGP), Electronic Control panels (ECP), Auxiliary Control panels (ACP), Variable Frequency Drive (VFD) Control panels, Rapper Control panels (RCP if applicable), Instrument panels etc. are normally supplied in set of either one/two/three or loose shipping sections with integral or loose supplied base frame. These panels may have to be installed as stand alone or in groups consisting of number of panels in each row, depending upon the plant layout and foundation arrangement.

- 3.3.2 ACP / SGP are double front draw-out /non-draw type consisting of circuit breakers units, contractor/starter, switch fuse units, protection and metering relays/ instruments etc. arranged in multi tier construction.
- 3.3.3 VFD for Fans etc., if applicable, will consist of VFD transformer, Dynamic Brake resistance panel (DBRP), Vacuum Circuit Breaker (VCB) etc.
- 3.3.4 The panels shall be transported from stores to place of installation in vertical position. Care shall be taken such that the switches, lamps, instruments etc., mounted on the panel do not get damaged during transit.
- 3.3.5 Panels have to be shifted to their locations through floor openings temporary openings like floor grills door etc. which shall be part of work and no claim whatsoever will be entertained with regard to non-availability of opening as per shortest route etc. Panel have to be erected at different locations and elevation in Plant Control Rooms, ESP control room , Plant area etc.
- 3.3.6 Panels are normally supplied with base frames. Wherever the panels are to be mounted on cable trenches channel supports have to be provided across the cable trench over which the base frame of panel shall be mounted. The scope of work includes fabrication and erection of steel frames/ bracket required for supporting the panels. Supply of materials like channels, angles etc. is in the scope of BHEL
- 3.3.7 Separate rates shall be paid for steel fabrication and erection of supports/brackets/ base frames as per rate schedule.
- 3.3.8 Installation of panel shall include fixing of base frame, fabrication of base frame if required, leveling, alignment, fixing of anti-vibration pads, removal of side covers, fixing of cubicle interconnection hardware, bus bar jointing, wiring interconnection, welding and grouting of panels and base frames, mounting of panel canopy wherever supplied as part of panel, drilling of gland plates (if additionally required) and sealing of cable entries.
- 3.3.9 Normally the panels shall be supplied with instrument, relay, meters, electronic modules etc. mounted and pre-wired. However if these are supplied loose / separately for safety in transit contractor shall mount/wire such devices as part of the panel installation work and no separate rates shall be applicable unless otherwise specially listed in the rate schedule.
- 3.3.10 No separate payment shall be made for replacement of any devices like electronic modules relays conductors terminal block push buttons etc. which are found defective during pre-commissioning / post-commissioning of any equipment / item.
- 3.3.11 Panel and instruments once erected in position should be properly protected using necessary care to prevent ingress of dust/moisture. This will have to be periodically cleaned and surroundings have to be kept tidy.
- 3.3.12 For the panels erected by other agencies commissioning / calibration work and trouble shooting has to be carried out by the contractor as part of testing and commissioning work as per the quoted rates for the same in the rate schedule.
- 3.3.13 Minor civil works like drilling, chipping, punching holes and opening in concrete floors slabs and brick walls grouting related to Rack support installation minor civil works required for installation of control panels Junction boxes etc., shall be included in the erection cost of such items. The scope also includes supply of grouting material, if any.
- 3.3.14 **TEST TO BE CARRIED OUT BEFORE COMMISSIONING SHALL INCLUDE THE FOLLOWING.**
- 3.3.14.1 Checking of installation for correctness.
- 3.3.14.2 Mechanical functional checking/ adjustment of individual breaker.
- 3.3.14.3 Measurement of Insulation resistance of individual breaker, complete switchgear board and combined insulation resistance of individual breaker with cable connected to drives.

- 3.3.14.4 Testing of Protection Relay, Thermal over relay, Power transducers Energy/ Ammeters, Voltmeters, Power factor, frequency, tri-vector meters & metering etc. in static & dynamic condition of relay.
- 3.3.14.5 Conducting test such as Insulation Resistance measurement, Ratio, polarity, winding resistance on CT and PT.
- 3.3.14.6 Checking of electrical control & protection interlock of individual breaker and integration with other system.
- 3.3.14.7 Calibration of energy meters, tri-vector meters, voltmeters, ammeters, power current & voltage transducers etc.
- 3.3.14.8 Provide assistance for checking the electrical operation of individuals breakers from local stations/remote panels/ MMI package.
- 3.3.14.9 The contractor shall arrange all the required testing instruments/ test kits / calibration equipments etc. for testing and calibration.

3.4 ERECTION OF DISCONNECTING SWITCH

- 3.4.1 Disconnecting switches are to be erected on the outer roof of ESP, between the HVR Transformer and insulator housing.
- 3.4.2 Adequate precautions have to be taken during shifting of disconnecting switches to ESP location, lifting, and erection to avoid any damage to the insulators inside them.
- 3.4.3 Ensure proper alignment as per drawing and that the supplied gaskets, ropes etc. are properly placed. Connect the copper tubes as per drawing using connectors supplied by BHEL.
- 3.4.4 The scope of work includes fabrication and erection of steel frames required for supporting the disconnecting switches. Supply of materials like angles etc. is in the scope of BHEL. Separate rates shall be paid for steel fabrication and erection of supports as per rate schedule.
- 3.4.5 **TESTING BEFORE COMMISSIONING SHALL INCLUDE THE FOLLOWING.**
 - 3.4.5.1 Cleaning of the switch internals, insulators etc. and application of lubricants.
 - 3.4.5.2 IR value check.
 - 3.4.5.3 Checking and ensuring copper connecting tubes are in order/tight and proper operation of the switch.

3.5 ERECTION OF INTERLOCKING SYSTEM

- 3.5.1 The interlocking system is provided in the ESP to ensure safety of personnel working in ESP. The system basically ensures isolation all the high voltage points before access is possible.
- 3.5.2 The system consists of one or more panels for holding the keys and have to be installed on the roof of ESP. The locks, which are supplied loose are to be fixed / welded to the access / inspection doors in Hoppers, Support Insulator housing, disconnecting switches, casing panel etc.
- 3.5.3 The scope of work includes fabrication and erection of steel frames required for supporting the disconnecting switches. Supply of materials like angles etc. is in the scope of BHEL. Separate rates shall be paid for steel fabrication and erection of supports as per rate schedule.

3.6 ERECTION OF HEATING ELEMENTS AND THERMOSTATS

- 3.6.1 Heating elements / heaters are tubular or panel type and are to be fixed in the appropriate areas where suitable provisions are already made by other agencies / BHEL.
- 3.6.2 Hopper Heaters are to be fixed in ESP hoppers, while Support insulator and Shaft insulator heaters are to be fixed in insulator housing on ESP roof area.
- 3.6.3 **TESTING BEFORE COMMISSIONING SHALL INCLUDE THE FOLLOWING.**

- 3.6.3.1 Check resistance and IR values of each heater. Provide low voltage heating if improvement of IR value is required.
- 3.6.3.2 Ensure the looping connections are as per drawing. Check the current in each phase.
- 3.6.3.3 Scope of work includes replacement of heater/s found defective, if any, at no extra cost to BHEL.

3.7 ERECTION OF JUNCTION BOXES AND PUSH BUTTON STATIONS

- 3.7.1 Various Junction Boxes and Push Button stations of steel construction shall be supplied with required holes in the gland plates, required cable glands and lugs.
- 3.7.2 The unit rate quoted for erection of JB's and Push button stations shall cover installation of JB's/SSPB's on supporting frames, painting the tag nos. of JB or fixing separate tag plate on JB's/SSPB's.
- 3.7.3 Separate rate shall be paid for fabrication and erection of supports as per rate schedule.
- 3.7.4 Required fasteners shall be supplied by BHEL free of cost.

3.8 ERECTION OF ASH LEVEL INDICATOR (ALI) AND OPACITY MONITOR (OPM)

- 3.8.1 The unit rate quoted shall include installation of ALI / OPM with all accessories, putting them into operation and providing assistance for commissioning and troubleshooting.
- 3.8.2 **ASH LEVEL INDICATOR** is a capacitance type level monitoring instrument consisting of an electronic unit, a probe and connecting co-axial cable.
- 3.8.3 The electronic unit is fixed to ESP support column below hoppers on supports/ brackets along with manifolds and associated fitting and clamps. The probe is fixed at specified height on the hoppers by cutting a suitable opening and welding an adapter. The connecting co-axial cable and earthing wire are run through flexible steel conduits. The flexible conduit is to be clamped suitably for support. All the materials like clamps, flexible conduits, fixing bolts etc. will be supplied by BHEL on free issue basis.
- 3.8.4 **OPACITY MONITOR** consists of an electronic unit, receiver unit, control unit and connecting cables.
- 3.8.5 The total OPM unit has to be installed in the outlet duct of ESP at specified location by a suitable opening and welding an adapter. All the materials like clamps, flexible conduits, fixing bolts etc. will be supplied by BHEL on free issue basis.
- 3.8.6 The Unit rate shall also cover marking tag Nos. of instruments/racks, either by paint or a separate tag plate as per BHEL Engineer directive.
- 3.8.7 Separate rates shall be paid for fabrication and erection of supports/brackets as per rate schedule.
- 3.8.8 Temporary protection by polythene sheets / steel sheets shall be provided by contractor for safe guarding the OPM against damages. The protective covers shall be provided at no extra cost by contractor

3.9 ERECTION OF INTEGRATED OPERATING SYSTEM (IOS)

- 3.9.1 The scope of installation of IOS includes providing power supply and electronic earthing of the IOS etc. assistance in commissioning and trouble shooting.
- 3.9.2 An IOS consists of two numbers of PC based controller (CPU), two CRT / LCD Monitors, one printer, one UPS, interconnecting cables and a set of furniture.
- 3.9.3 The scope of work includes Unit rate quoted for IOS shall cover installation & integration of all the above said equipment and providing necessary commissioning assistance. No separate unit rate applicable for installation of all loose items/ modules/ components or accessories etc, which is not explicitly mentioned in the rate schedule, but comes as

part of the system.

3.10 SCOPE OF COMMISSIONING OF EQUIPMENT ERECTED BY THE MECHANICAL CONTRACTOR / OTHER AGENCIES.

3.10.1 HT MOTORS (Not applicable)

- a) Measurement of winding resistance.
- b) Testing of CT where required.
- c) Meggering and if insulation resistance is low, dry out of the motor.
- d) Conducting polarization index test, if required.
- e) Testing the healthiness of RTDs. Replacement of defective element (only for bearing).
- f) Checking direction of rotation of motors and testing and commissioning from local as well as remote.

3.10.2 LT MOTORS / RAPPING DRIVES

- a) Checking IR value and if insulation resistance is low, dry out of the motor.
- b) Measuring winding resistance.
- c) Checking direction of rotation of motors and testing and commissioning from local as well as remote.

3.10.3 ACTUATORS FOR DAMPERS/ GATES ETC.

- a) Measuring of winding resistance and IR value of drive motor and if insulation resistance is low, dry out of the motor.
- b) Checking direction of rotation of motors and testing and commissioning from local as well as remote.

Scope of work includes providing loop wire on actuator terminal block, setting of mechanical/ electrical or electronic position transmitters, setting of limit / torque switches, cable checking, internal wiring checks, local / remote operation from MCC&MMI package and replacing defective components like limit switches etc.

3.10.4 ELECTRICAL HOIST

- a) Electrically operated hoist are provided for maintenance purpose of High Voltage Rectifier Transformer installed on the roof of electrostatic precipitator etc. Mechanical erections of hoist components such as runway beams, hoist carriage, drive unit, etc. shall be done by another agency / BHEL. The scope of work covered in this tender specification for erection and commissioning is installation of DSL system and associated accessories. The scope of work for the contract in this package is as follows.
- b) DSL SYSTEM : It consists of tee iron guide for cable trolley and associated supporting structural members, trailing cable, cable guide trolley, dog chain, switch fuse unit, limit switch etc.
- c) DSL system shall have to be erected at higher elevation. Contractor shall take all safety measures while carrying out the work.
- d) For installation of tee iron & other structural steel member, unit rate for fabrication & erection shall be applicable and for other items unit rate shall be paid as per rate schedule. However cable dressing, fixing of leather bands, rope clamps and any incidental work such making approaches for executing the work, scaffolding etc. shall be part of work.
- e) Commissioning & testing of electrical hoists shall include panel wiring check, IR measurement, functional check, over load relay testing, trail run, providing assistance during load test, replacement of component if required etc.. However preparatory work for load test and arrangement of load etc. shall be done by another agency / BHEL.

3.10.5 HIGH VOLTAGE RECTIFIER TRANSFORMER (HVR)

- a) Installation and functional check of various devices supplied loose along with transformer like Buckholtz relay, breather etc., including replacement, if required.
- b) Checking of IR value of primary and secondary windings.
- c) Winding resistance measurement.
- d) Filtration of Oil for atleast one full cycle.
- e) Measuring BDV of oil and further filtration, if required.
- f) Topping of transformer oil and thorough cleaning of the HVR.
- g) Assistance during OC and SC test of the transformer.

3.11 CABLE LAYING

- 3.11.1 Laying of power and Control Cable includes transportation from BHEL's stores, laying, dressing, clamping and tagging cable marker at both ends. The cable shall be laid in Ladder / perforated type cable trays. The Cables shall be tied after dressing using 3mm dia nylon ropes/ties and the nylon ropes/ties shall be supplied by the contractor. The cable shall be clamped suitably with cable trays at maximum 1.5M interval using 3mm aluminum clamps/strips as per the instruction of BHEL Engineer. **Supply of necessary strips, clamps and bolts for the above work is included in the contractor's scope.**
- 3.11.2 The contractor shall lay the cables on cable trays, in built-up cable trenches, vertical tray ways, overhead areas and supports, pulled through conduits, pipes, run clamped on wall / ceiling steel structure etc. A uniform rate to be quoted shall include laying, proper dressing, tying etc. Standard of Workmanship shall be to the approval of BHEL Engineers.
- 3.11.3 The arrangement of the Cable and all methods of laying shall be planned to provide an orderly formation to avoid bends and crossings and to facilitate easy removal of any one cable without undue disturbance to adjacent cables. The Standard of Workmanship shall be to the approval of BHEL Engineers.
- 3.11.4 Cable laid in (or) entering into (or) emerging from cable racks, cable trays, conduits, cable supports shall be suitably formed to avoid bearing against sharp edges.
- 3.11.5 When cables pass through floors, walls etc., etc it shall be passed through a pipe for mechanical protection and the pipe ends sealed suitably.
- 3.11.6 Care shall be taken to avoid sharp bending and kinking of conductor, damaging insulation and stressing the cable beyond the pulling force recommended by the manufactures. Cables shall be protected at all times from mechanical damage.
- 3.11.7 Where cabling passes through brickwork (or) concrete work suitable local protection against mechanical damage shall be provided by the contractor.
- 3.11.8 Jointing of cables, if necessary, shall be done by crimping type cable joints after getting the approval of BHEL Engineers.
- 3.11.9 Entry to the panels and JBs may be at top, sides or bottom. All cables are require to be properly supported and clamped near to the JB panel.
- 3.11.10 Many of the cable trays and cables have to be laid in cable trenches. For this purpose the cover of the trenches have to be opened for working in site and whenever the cables are to be laid in existing cable tray, all safety precautions have to be observed. After completing the work the trenches have to be cleaned and covers put back into position Contractor shall also carry out de-watering from the trenches if required and arrange pumps etc., at his cost.
- 3.11.11 Contractor shall carefully plan the cutting schedule of each cable drum in consultation with site engineer such that wastage are minimized.

3.12 TERMINATION OF CABLES

- 3.12.1 All the cables laid by the contractor shall be terminated by him. **Cable glands and lugs will be supplied along with the panels / equipments etc., unless specifically mentioned otherwise.** Unit rates for various sizes of cables is to be indicated in rate schedule.
- 3.12.2 Termination includes dressing & glanding, splicing and dressing inside panels, JB's etc., providing ferrules / printed ferrules (contractor to arrange ferrule printing machines) and crimping of lugs.
- 3.12.3 Supply of required PVC cable ties, PVC ferrules, PVE button and tapes, PVE sleeves, compounds, necessary tools, joining materials etc. shall be supplied by the contractor within the quoted rates for cable termination. The quality of material shall be got approved from BHEL engineer prior to their use on job. is in the contractor's scope.
- 3.12.4 Special tool clips, saddles, etc., required for the connections and terminations of cables shall also be provided by the Contractor at his cost.
- 3.12.5 At cable termination points, where the conductor and the cable insulation will be terminated termination shall be made in a neat, workman like manner.
- 3.12.6 The Contractor shall include connections to termination of various equipment installed by other agencies. The contractor shall work in co-operation with other agencies in obtaining correct direction of rotation and commissioning of equipments.
- 3.12.7 Looping wire at terminal block of panels and electrical actuator as shown in the inter-connection diagrams or as required is to be done by contractor at no extra cost.
- 3.12.8 Cable lugs shall be provided by compression, adapting necessary crimping tools. Insulating sleeves shall be provided over the barriers and conductors to prevent accidental contact with ground (or) adjacent terminals. The insulating sleeves shall be fire resistant and be long enough to over pass conductor insulation and shall be properly sized.
- 3.12.9 Termination of all cables installed by the Contractor is included in his scope, The work of testing and reconnection, changing of connections re-arrangement of leads to required extent shall be carried out by the contractor without additional cost.
- 3.12.10 Cable shielding – all signal cables are supplied with bare shielded copper wire/with braided wire shield. Generally shield wire is kept isolated at instrument/field device end and continuity is maintained through JB and grounded at panel end only. While terminating the shield wire, either in panel or JB, PVC sleeves are to be used to avoid two-point earthing.

3.12.11 TESTING BEFORE COMMISSIONING SHALL INCLUDE THE FOLLOWING.

3.12.11.1 HT CABLE

- a) Insulation resistance of the HT cable.
- b) Conducting Hi-pot Test.
- c) Ensure proper identification tags are in place.

3.12.11.2 LT POWER / CONTROL / INSTRUMENT CABLES

- a) Insulation resistance of the cable.
- b) Identify the cables with tag plates.

3.13 INSTALLATION OF CABLE TRAYS AND ACCESSORIES

- 3.13.1 Erection of Cable Trays includes installing ladder/perforated type cable trays in cable trenches, plant area, steel columns, overhead areas etc. on the supports already provided. Approximate quantity is indicated in the rate schedule.
- 3.13.2 Cable trays, coupler plates and fasteners shall be supplied by BHEL.

- 3.13.3 Only straight trays will be supplied by BHEL. Other accessories like Bends Tees. Cross, etc... which may be required for proper laying of cable as per cable routing will be fabricated by the contractor at his cost to the extent of 10% of the number of trays supplied by BHEL. The fabricated trays shall conform to the shape and configuration of original bends etc, that would have been supplied. The fabrication of the bends from straight trays will include cutting the ladder steps, bending the side plates to the required radius and re-welding the ladder steps with the bent plates. Trays supplied will be of G.I. and hence 1.5mm citofine electrode only shall be used for welding purposes. All cuttings shall be done only with hack-saw and gas cutting should not be resorted to.
- 3.13.4 The cable trays shall be adequately tack welded to supporting steel work and shall be sufficiently supported to prevent sagging. The weld shall be painted using cold galvanizing paint (supply of paint is in the scope of contractor)
- 3.13.5 In case cable trays are required to be fabricated from structural steel and installed, unit rate applicable for fabrication and installation of structural steel shall be applicable in such instance.

3.14 INSTALLATION OF EARTHING

- 3.14.1 Installation of above-ground earthing for the complete system is the scope of the contractor. following. Required quantity of GI flats/wires will be supplied by BHEL.
- 3.14.2 Earthing of all motors, Switch gear Panels, LTMCC , PMCC , ACP, PLC, Electronic Control Panel, Push Button Stations, Junction Boxes, Transformers, Heaters, thermostats, instruments, Cable trays and accessories, cable armours and conduits used for cable installation, etc. are in the scope of work.
- 3.14.3 Installation of earthing conductors and terminations at the equipments and at the earth rings / buses/ earth pits and the necessary clamping of the conductors shall be carried out by the contractor. The tentative quantities required for the earthing is indicated in the rate schedule.
- 3.14.4 All equipments shall be earthed by two separate and distinct connections. Earthing terminals will be available in all the equipment supplied by BHEL.
- 3.14.5 The earthing conductor of galvanized mild steel strips, wires will be supplied by BHEL. All connections for the equipment to the main earthing conductor shall be made as indicated in schematic drawings provided during execution of work.
- 3.14.6 A continuous earthing conductor shall be installed in all cable trays and securely clamped to each tray section by suitable connections to form a continuous earthing system. When two (or) more trays supporting power cables run parallel, a continuous earthing conductor shall be provided on one tray only with tap offs to the control cable trays.
- 3.14.7 All joints in the earthing system shall be welded type. Earthing connections to all equipment including motor shall be of bolted type.
- 3.14.8 Earthing connections shall be free from tinning, scale, paint, enamel, grease, rust (or) dirt at the time of making joint.
- 3.14.9 Screens / Shields and armour of all multi core cables shall be bonded and earthed.
- 3.14.10 Earthing conductors ,along their run on columns, beams, walls etc. shall be supported by suitable cleats to intervals of 750mm.
- 3.14.11 Welded joints shall be painted with red oxide and Aluminium paint / cold galvanizing paint in turn and afterwards coated with bitumen as per IS 3043. Supply of paint etc. are in the scope of contractor.
- 3.14.12 Earth lead and riser connections shall be as short and direct as possible and shall be without any links and spacing.

3.14.13 All earthing works includes laying of earthing flat as per the schematic drawing and termination up to the earthing pit.

3.15 FLEXIBLE CABLE TRAYS SUPPORT SYSTEM

- 3.15.1 Cable tray support system shall be pre-fabricated similar or equivalent to “Unistrut make”. Support system for cable trays shall essentially comprise of the two components i.e. main support channel and cantilever arms. The main support channel shall be of two types: (i) C1:- having provision of supporting cable trays on one side and (ii) C2:-having provision of supporting cable trays on both sides. The support system shall be the type described hereunder
- 3.15.2 Cable supporting steel work for cable racks/cables shall comprise of various channel sections, cantilever arms, various brackets, clamps, floor plates, all hardware such as lock washers, hexagon nuts, hexagon head bolt, support hooks, stud nuts, hexagon head screw, channel nut, channel nut with springs, fixing studs, etc.
- 3.15.3 The system shall be designed such that it allows easy assembly at site by using bolting. All cable supporting steel work, hardware fittings and accessories shall be pre-fabricated factory galvanized.
- 3.15.4 The main support and cantilever arms shall be fixed at site using necessary brackets, clamps, fittings, bolts, nuts and other hardware etc. to form various arrangements required to support the cable trays. Welding of the components shall not be allowed. However, welding of the bracket (to which the main support channel is bolted) to the overhead beams, structural steel, insert plated or reinforcement bars will be permitted. Any cutting or welding of the galvanized surface shall be brushed and red lead primer, oil primer & aluminum paint shall be applied.
- 3.15.5 All steel components, accessories, fitting and hardware shall be hot dip galvanized after completing welding, cutting, drilling and other machining operation.
- 3.15.6 The typical arrangement of flexible support system is shown in the enclosed drawings and described briefly below.
- 3.15.7 The main support channel and cantilever arms shall be fabricated out of minimum 2.5 thick rolled steel sheet conforming to IS.
- 3.15.8 Cantilever arms of 300 mm, 600 mm and 750 mm in length are required, and shall be as shown in the enclosed drawing. The arm portion shall be suitable for assembling the complete arm assembly on to component constructed of standard channel section. The back plate shall allow sufficient clearance for fixing bolt to be tightened with tray in position.
- 3.15.9 The size of structural steel members or thickness of sheet steel of main support channel and cantilever arms and other accessories and indicated above or in the enclosed drawings are indicative only. Main support channels may be supplied in any suitable lengths to minimize the wastage. Nevertheless, the support system shall be designed by the bidder to fully meet the requirements of type tests as specified. In case the system fails in the tests, the components design modification shall be done by the Bidder without any additional cost to the Employer. The bidder shall submit the detailed drawings of the system offered by him along with the bid.

3.16 STRUCTURAL STEEL FABRICATION AND ERECTION

- 3.16.1 Structural steel material like MS angles, channels, beams, flats, plates, pipes etc. shall be supplied in running meters and same shall be used for fabrication of panel base frame, cable tray supports, supporting frames for instruments, junction boxes, distribution boards, impulse lines etc., canopies for instruments/ panels/JB/push button stations etc.
- 3.16.2 This shall include cutting to size, contouring of end for connections if required, welding, grinding of excess weld deposits/ burrs, drilling of holes for mounting of device/instrument, installation at location, leveling, alignment, providing bracings, painting etc. **No gas cut holes will be permitted** contractor to follow the BHEL supplied welding schedule and welding procedures.

- 3.16.3 All the fabricated supports/frames shall be painted as per painting schedule. **All paints, primers etc. are in the scope of the contractor.**
- 3.16.4 Frame installation/cable tray accessories' installation at site may involve mounting either on concrete floor by grouting/using anchor fasteners or on steel structure by welding etc. All consumables shall be arranged by the contractor.
- 3.16.5 In certain packages galvanized members of junction box frames and instrument racks shall be supplied in cut to sizes and frame assemblies are required to be done as per drawing by bolting/welding. The installation rate as quoted shall include the assembling of the frames.
- 3.16.6 Gas cutting of tray/impulse pipe support and gas cut holes in frame shall be avoided. Only drilled hole is permitted in frame etc.

3.17 PAINTING

- 3.17.1 **Supply of Primer, Finish paint etc is included in the scope of the contractor.** Paints shall be arranged from standard reputed suppliers in consultation with BHEL.
- 3.17.2 **Colour Banding, Legend and Identification Marking, Direction Marking etc. shall be in scope of the contractor for all items erected/commissioned by the contractor.**
- 3.17.3 All the weld joints of GI cable trays and GI structural members shall be applied with a coat of cold galvanizing zinc paint. Paint etc shall be arranged by contractor at his cost.

3.17.4 STRUCTURALS

- 3.17.4.1 All the supporting steel work for the over head cable trays, risers, JBS, SSPBs, instruments etc., shall also have protective painting. The surfaces of the above shall be free from rust, foreign adhering matters, grease etc. structural components shall be cleaned as per specifications and then coated with two coats of primer and finish paint as per BHEL instructions.

3.17.5 PANELS, JUNCTION BOXES , TRANSFORMER ETC.

- 3.17.5.1 Panels and Junction Boxes shall be Touch-up painted as and where original shop paint is peeled off. Necessary surface cleaning and preparation shall be done by the contractor as per relevant painting codes followed by two coats of Primer and two coats of Finish Paint.

3.18 INTEGRATED TESTING, PRE-COMMISSIONING, AND POST COMMISSIONING

- 3.18.1 The contractor shall perform various activities during pre-commissioning, integrated Testing, post commissioning stages of equipment covered under this tender specification. It is responsibility of contractor to arranged tools & plants, test equipments, experienced engineers and technicians.
- 3.18.2 The contractor's commissioning group shall work as per the instruction of BHEL engineer and they shall coordinate day-to-day activity with other agency and BHEL/ customer. The testing activity may have to repeated till satisfactory results are obtained and also to satisfy the requirement of BHEL.
- 3.18.3 The equipments erected by the contractor will be tested and commissioned as per normal testing practice like panel charging, Meggering of cables, conducting of open circuit / short circuit testing etc. as per the instruction of BHEL engineers.
- 3.18.4 The contractor will supply required manpower along with all required testing equipments like multimeter, megger, tong tester, test kit etc. and his quoted rates will be inclusive of all equipment / instruments like multimeter, megger, tong tester, test kit etc. and his quoted rates will be inclusive of all above aspects.
- 3.18.5 The contractor shall prepare all erection / commissioning log sheets and protocols / test certificates as per field quality plan, get is signed by the concerned BHEL/Customer engineer and submit the same to BHEL engineer as per his instruction.

- 3.18.6 While testing and commissioning, if the equipment to which the cabling is connected is observed to be not functioning, it is the responsibility of the contractor to check, establish and demonstrate, in close coordination with the commissioning agencies, that there is no defect in the cabling. The contractor shall depute his supervisor and workmen to assist the commissioning agencies to check the interconnecting cables.
- 3.18.7 The mobilization of these commissioning groups shall be such that planned activities are taken up in time and also completed as per schedule and work undertaken round the clock if required. It is responsibility of contractor to discuss on day to day basis the requirement of manpower, consumables, tools & tackles / testing equipments with BHEL engineers and arrange for the same.
- 3.18.8 During the commissioning activities and carrying out various tests, if any one of temporarily work such mounting of test equipments / cabling etc are required, the contractor shall carry out such work without on any extra cost. The same shall be removed after completion of the activity.
- 3.18.9 The contractor shall carry out any other tests as desired by BHEL engineer on erected equipment covered under the scope of this contract during testing, per- commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the contractor.

3.19 **ELECTRICAL INSPECTORATE'S APPROVAL/ STATUTORY INSPECTION**

- 3.19.1 Contractor shall have/obtain valid electrical contractors License to carry out the erection, Testing & Commissioning work on High/Low voltage electrical equipments from the appropriate statutory authority of concerned state or central electricity authority, as the case may be. All fees and expense in this regard shall be in the contractor's account.
- 3.19.2 Contractors shall arrange inspection of concerned statutory Authority for the installation, testing & commissioning of high / low voltage equipments covered under the scope of work and including those erected by other agencies and obtain the statutory authorities approval in appropriate format prior to charging of the equipments.
- 3.19.3 Contactor shall be responsible for all necessary liasioning work with statutory authority towards the certification of installation / works. BHEL will only pay statutory fees in respect of inspection of all installations as per demand note/challan issued by the statutory authority. All other expense shall be borne by the contractor. BHEL / BHEL's customer shall be providing technical assistance, drawing & document for submission to statutory authority. Contractor shall provide all logistics services in this regard.

3.20 **STANDARDS**

- 3.20.1 Complete erection shall confirm to Indian Electricity Act with latest amendments and also to latest editions of the relavant Indian Standards.
- a) IS:2274- Code of practice for electrical wiring installation. (System Voltage not exceeding –650 V).
 - b) IS:732- Code of practice for electrical wiring installation (System Voltage not exceeding – 650 V)
 - c) IS:732 – Code of practice for earthing.
 - d) IS : 3072 – Code of practice for installation and maintenance of switch gears.
 - e) The latest edition of IE Act & IE Rules.
 - f) Other relevant standards as applicable.

3.21 **MEASUREMENTS**

- 3.21.1 For all payments purposes, measurement shall be made on the basis of actual execution in line with drawings/ documents /site requirements.

- 3.21.2 The measurement of cable, impulse pipes/ tubes, conduits, flexible conduits, trays etc. shall be made on the basis of length actually laid.
- 3.21.3 For all site-fabricated steel items such as supports, racks, frame, canopy etc., physical measurement shall be made and then converted to tonnage. For steel material supplied to contractor, all scrap shall be returned to BHEL stores with due accounting.
- 3.21.4 The cable take-off from drums shall be planned strategically such that jointing in the run of cables and wastage are avoided. For this purpose, the exact route length between various equipment /panels as per the cable schedule shall be measured and the route length recorded before laying of the cables. Depending upon the route length and the type of cable required for various destinations, the cable drums should be suitably selected for cable laying. Any jointing shall be approved by the BHEL Engineer. All the cut pieces/ bits of cables, which are not used/ unused shall be returned to BHEL for accounting purpose.

3.22 **TERMS OF PAYMENT FOR ELECTRICAL WORKS :**

3.22.1 ERECTION WORKS

- a) 60% of the contract rate on pro-rata basis progressively as and when the erection work is completed as per BHEL drawings and instructions.
- b) Further 30% of the contract rate shall be paid on completion of alignment grouting, Cable laying, Cable termination, cable dressing, Tagging and testing of entire equipment to the satisfaction of BHEL and their client.
- c) Further 5% of the contract value shall be paid on commissioning of entire equipment to the satisfaction of BHEL and their client.

3.22.2 DISMANTLING WORKS

- a) 95% payment of the tonnage rate for dismantling will be released on prorata basis after the materials are dismantled, transported and handed over to BHEL'S Clients storage yard.
- b) Balance 5% will be released on completion of the entire dismantling work as certified by BHEL Engineer.

3.22.3 SUPPLY OF ILLUMINATION SYSTEM

- a) 90% of the contract rate for each item shall be paid on receipt at site as certified by BHEL Engineer.
- b) Further 5% of the contract rate value shall be paid on commissioning of entire illumination system to the satisfaction of BHEL and their Client.

- 3.22.4 The balance 5% of the contract value in 3.22.1 & 3.22.3 above shall be paid after guarantee period of 12 months. The guarantee period will commence from the date of handing over of the unit to the customer or six months after the date of successful completion of Trial run, whichever is earlier. However, this 5% amount can be released against Bank Guarantee valid for 12 months as aforesaid in the prescribed proforma of BHEL.

SECTION - IV

SPECIAL CONDITIONS OF CONTRACT FOR ELECTRICAL WORKS

4.1 SCOPE OF CONTRACT

The indent of this specification is to provide services for execution of projects according to most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for the proper and efficient services towards the work allotted shall not relieve the contractor of the responsibility of providing such services/facilities to complete the project or portion of project awarded to him. The quoted rate shall deem to be inclusive of all such contingencies.

- 4.1.2 The contractor shall carry out the work in accordance with instructions/drawings/specification standard practices supplied by BHEL from time to time.
- 4.1.3 Provision of all types of labour, supervisors, Stores staff, watch and ward as required, tools and tackles as specified consumables as specified under various clauses of Tender Specification for erection, testing and commissioning and dismantling of existing structures.
- 4.1.4 Proper out turn as per BHEL plan and commitment.
- 4.1.5 Completion of work in time.
- 4.1.6 Good quality and accurate workmanship for proper performance of equipment.
- 4.1.7 Repair and rectification.
- 4.1.8 Re-conservation / preservation of all components.
- 4.1.9 **Comprehensive Reporting on the progress of the Work on daily basis, attending review meetings with BHEL to monitor and speed up the work and taking steps as directed to speed up the work/ improve the Quality and Safety of the Work.**

4.2 FACILITIES TO BE PROVIDED AND DEVELOPED BY THE BIDDERS AT HIS COST

- 4.2.1 It shall be the responsibility of the contractor to construct his own office shed, stores shed, labour tonements, with all facilities like electricity, water supply, sanitary arrangements in the area allotted to him for the purpose.
- 4.2.2 Distribution of water for construction purposes and as well as drinking purpose from the single point provided by BHEL to various works fronts shall be the Contractor's responsibility and at his cost.
- 4.2.3 Necessary meters for recording consumption of water and power for cost analysis purpose and maintenance of the same during execution period shall be Contractor's responsibility.
- 4.2.4 Provision for distribution of electrical power from the given single central point to the required places with proper distribution boards, approved cable laying, including supply of all materials like cables, switch boards, pipes, etc., observing the safety rules laid down by the Electricity Authority of the State/BHEL/their customer shall be the responsibility of the Bidder /contractor.

- 4.2.5** As there are bound to be interruptions in regular power supply, power cut/load shedding in any construct on sites due to inherent power shortage in State on this account, suitable extension of time only be given and contractor is not entitled for any compensation. Such interruptions should be intimated to BHEL by the contractor timely It shall be the responsibility of the contractor to have at least a few diesel operated welding generator sets to get urgent and important work done with out interruption.
- 4.2.6** Adequate lighting facilities such as flood lamps, 24V Safety lamps and area flood lighting shall be arranged by the Contractor at the site of constructions, pre-assembly area, Contractor's material storage area and at access roads etc., at his cost.
- 4.2.7** For the purpose of Planning, Contractor shall furnish along with tender, the estimated requirement of power (month wise) for execution of work in terms of maximum KW demand.
- 4.2.8** On completion of work, all the temporary buildings, structures, pipelines, cables etc. shall be dismantled and leveled and debris shall be removed as per instruction of BHEL by the contractor at his cost. In the event of his failure to do so, the same will be arranged to be removed and expenditure therefore will be recovered from the Contractor. The decision of BHEL Engineer in this regard is final.
- 4.2.9** The Contractor shall provide all materials required for scaffolding, formwork and centering wherever necessary for erection should arrange at his cost.
- 4.2.10** Depending upon the nature of work and availability of facilities locally, Contractor may have to arrange for a temporary work-shop for facilitating uninterrupted progress of work.
- 4.2.11** The contractor shall secure and maintain comprehensive including third party insurance for appropriate amount to protect your and our interest against all risk and claims to the men/women or for labour force. If failure in securing the insurance policies in this regard shall not absolve you from reimbursing to us for any loss / damages / injuries or death to any person.
- 4.2.12** The contractor shall be fully responsible for obtaining labour licence/approval if any, from State/Central/Local authorities at his own cost and risk.
- 4.2.13** It is the responsibility of contractor to obtain approval from statutory authorities like pollution control board, Factory Inspectorate etc., if necessary.
- 4.2.14** All fees connected with the contractor for Testing his Welders/Men / Works and Testing, Inspection, calibrating his instruments and equipments, shall be paid by the contractor. It shall be contractor's responsibility to obtain approval of Statutory Authorities, wherever applicable, for the conducting of any work which comes under the Purview of these Authorities. Any cost arising from this shall be contractor's Account.
- 4.3 GASES**
- 4.3.1** All required gases like oxygen / Acetyllene / LPG for the work shall be supplied by the Contractor at his cost. It shall be the responsibility of the Contractor to plan the activities and store sufficient quantity of these gases Non-availability of gases cannot be considered as reason for not attending the required progress.
- 5.3.2** In case of improper arrangement of above gases, BHEL reserves the right to procure the same from any source and recover the cost from the Contractor's bill at market value plus BHEL departmental charges as may be fixed from time to time Postponement of recoveries is not permissible. The decision of BHEL Engineer in this regard is final and binding on the Contractor.

- 4.3.2** BHEL reserves the right to reject the use of any gas in case the required purity is not maintained.
- 4.3.3** The Contractor shall submit Weekly / fortnightly / monthly statements / reports regarding consumption of above gases for cost analysis programme.
- 4.3.4** The Contractor shall ensure safekeeping of the inflammable cylinders at separate place away from normal habit with proper security etc.

4.4 ELECTRODES

- 4.4.1** All the electrodes required shall be arranged by Contractor at his cost. It shall be the responsibility of the Contractor to obtain prior approval of BHEL before procurement, regarding suppliers, type of electrodes etc. On receipt of the electrodes at site, it shall be subjected to inspection and approval by BHEL. The Contractor shall inform BHEL, the details regarding type of electrode, batch number, date of expiry etc.
- 4.4.2** Storage of electrode shall be done in an air-conditioned / controlled humidity room as per requirement.
- 4.4.3** Shortage of any of the electrodes of the equipment suggested by BHEL shall not be quoted as reason for deficiency in progress or for additional rate.
- 4.4.4** BHEL reserves the right to reject the use of any electrodes at any stage, if found defective because of bad quality, improper storage, quality, date of expiry, unapproved type of electrodes etc. It shall be the responsibility of the Contractor to replace at his cost with out loss of time.
- 4.4.5** All electrodes shall be dried in the electrodes drying oven to the temperature and period specified by BHEL Engineer before they are used for erection work. Electrode drying ovens shall be provided by the contractor.
- 4.4.6** In case of improper arrangement for procurement of above electrodes, BHEL reserves the right to procure the same from any source and recover the cost from the Contractor's first subsequent bills at market value plus the departmental charges of BHEL communicated from time to time. Postponement of such recovery is not permitted.
- 4.4.7** Contractor shall submit weekly/ fortnightly / monthly statement / reports regarding consumption of electrodes of all types for cost analysis purpose.

4.5 CRANE AND OTHER TOOLS AND TACKLES

- 4.5.1** All the T&P including Cranes, trucks, lorries, tractors, trailers etc required for the satisfactory execution of work shall be arranged by the Contractor. BHEL will not arrange any Tools and Plants.
- 4.5.2** All the T&P arranged by the Contractor including electrical connection wherein required shall be reliable / proven tested with necessary test certificate.
- 4.5.3** All the T&P, lifting tackles including wire ropes, sling, shackles and electrically operated equipments arranged by Contractor shall be got approved by BHEL Engineer before they are actually put on use.
- 4.5.4** Civil works required for safe and efficient operation of tools and tackles shall be the Contractor's responsibility.

4.5.5 Contractor shall take into consideration the above clauses and quote the rates as called for in the rate Schedule.

4.5.6 SUPERVISORY STAFF AND WORKMEN

4.6.1 The Contractor shall supply all skilled workmen like welders, gas cutters, riggers, erectors, carpenters, fitters, electricians etc., in addition to other skilled, semi-skilled, unskilled workmen required for all the works of receipt, material handling, transportation, erection, testing and commissioning contemplated under this specification. Only fully trained and competent men with previous experience in the job shall be employed. They shall hold certificates wherever necessary. BHEL reserves the right to decide on the suitability of the workers and other personnel who will be employed by the contractor. BHEL reserves the right to insist or removal of any employee of the Contractor shall for with remove him.

4.6.2 The supervisory staff employed by the Contractor shall ensure proper out-turn of work and discipline on the part of the labour put on the job by Contractor and in general see that the works are carried out in a safe and proper manner and in co-ordination with other labour and staff employed directly by BHEL or other contractors of BHEL or BHEL'S client.

4.6.3 The contractor shall also furnish daily labour report showing by classification the number of employees engaged in various categories of work and a progress report of work as required by BHEL Engineer.

4.6.4 The work shall be executed under the usual conditions affecting major power plant constructions and in conjunction with numerous other operations at site. The Contractor and his personnel shall co-operate with other personnel and proceed in a manner that shall not delay or hinder the progress of work as a whole.

4.6.5 It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer/ BHEL, to work beyond normal working hours, the contractor shall arrange necessary work permit for working beyond normal working hours.

4.6.6 The Contractor's supervisory staff shall execute the work in the most substantial and work man like manner in the stipulated time Accuracy of work and aesthetic finish are essential part of this contract. The contract shall be responsible to ensure that assembly and workmanship confirm to the dimensions and tolerances given in the drawings/instructions given by BHEL Engineers, from time to time.

4.6.7 The Contractor shall employ the necessary number of qualified and approved full time electricians at his cost to maintain his temporary electrical installation till the completion of work.

4.6.8 It is the responsibility of the Contractor to engage his workmen in shifts or on over time basis for achieving the target set by BHEL and also during the period of commissioning and testing The Contractor's quoted rate shall include all these contingencies.

4.6.9 In case Contractor's progress is found unsatisfactory BHEL may deploy fitters, welders, operators and technicians on BHEL rates and will assist in improving the progress. All expenses incurred for will be recovered from Contractor's bill.

4.6.10 If the Contractor or his workmen or employees shall break, deface, injure or destroy any part of building, road kerb fence enclosure, water pipes, cables, drains, electric or telephone posts or

wires, trees or any other property or to any part of erected components etc., the Contractor shall make the same good at his own expense or in default, BHEL may cause the same to be made good by other workmen or by other means and deduct the expenses (of which BHEL'S decision is final) from any money due from the Contractor.

4.7 CIVIL WORKS

- 4.7.1** Column foundation and foundation for other plants, control room building and necessary civil works shall be provided by BHEL. The dimensions of the foundation and anchor bolt pits shall be checked by the Contractor for their correctness as per drawings. Further, top elevation of foundations shall be checked with respect to benchmark, etc. All minor adjustments of foundation level, dressing and chipping of foundation, up to 40mm surfaces, enlarging the pockets in foundations etc., as may be required for the erection of equipment/plants shall be carried out by the Contractor. All materials like cement, steel etc., shall also be arranged by the Contractor.
- 4.7.2** Any civil works required for safe and efficient operation of tools and tackles issued by BHEL like grouting/excavation casting of foundation for anchor points for derricks, winches etc., and any other temporary supports shall be the Contractor's responsibility.
- 4.7.3** The Contractor shall ensure perfect matching of packer plates with foundation by dressing the foundation and between the packer plates and the base plates of structural column/equipment to the satisfaction of BHEL Engineer.
- 4.7.4** Grouting of column base plates/equipments foundation box and base plates shall be carried out by the Contractor for which cement alone will be provided by BHEL on chargeable basis. All other materials to be arranged by Contractor.
- 4.7.5** The contractor shall satisfy himself regarding the correctness of the civil works, foundation, etc., so that the equipment erected by him shall not suffer due to any defects in the above. For this purpose, he should also visit site during the progress of civil construction works, if necessary, to ensure that the civil work is carried out as per his requirements.

4.8 SCOPE OF MATERIAL HANDLING

- 4.8.1** While BHEL will endeavor to store/stack/identify materials properly in their open/closed storage yard/shed, it shall be Contractor's responsibility to assist BHEL in identifying materials well in time for erection, taking delivery of the same, following the procedure indicated by BHEL and transport the materials safely to pre-assembly yard, erection site in time, according to schedule.
- 4.8.2** The Contractor shall identify necessary supervisor/labour for the above work in sufficient quantity as may be needed by BHEL for areas covering their scope.
- 4.8.3** It shall be the Contractor's responsibility to arrange for necessary crane/tractor/trailor or trucks/slings/tools and tackles /labour/including operators for loading from storage yard on to transport equipment, move it to erection site/pre-assembly yard and unload the same at pre-assembly yard/erection site and to erect the ESP and the quoted rate shall include the same. Bidders may please note that the storage yards are at an approximate distance of 5.0.km from erection site.
- 4.8.4** All equipments so used by Contractor shall be of proven quality and safe in operation as approved by BHEL Site Engineer's from time to time.
- 4.8.5** Any loss/damage to materials issued to Contractor shall be made good by him or BHEL will arrange for replacement at cost recovery basis and decision of BHEL shall be final.

- 4.8.6** The Contractor shall take delivery of components and equipment and special consumables from storage area after getting the approval of BHEL Engineer on standard indent forms.
- 4.8.7** In the event of Contractor's inability to arrange in time any of the above equipment/T&P etc., if possible BHEL shall provide the same on specific written request from the Contractor subject to the availability of equipment on the normal hire charges of BHEL, applicable from time to time and recoverable from Contractor's subsequent month's running bills.
- 4.8.8** All the surplus, damaged unused materials, package materials/containers, special transporting frames, gunny bags etc. supplied by BHEL shall be returned to BHEL Stores by the Contractor.
- 4.8.9** The Contractor shall have total responsibility for all equipment and materials in his custody, stores, loose, semi-assembled, assembled or erected by him at Site.
- 4.8.10** The Contractor shall make suitable security arrangements (round the clock) including employment of security personnel to ensure the protection of all materials/equipments and works from theft fire, pilferage and any other damage and loss at Site.
- 4.8.11** The Contractor shall ensure that all the packing materials and protection devices used for the various equipments during transit and storage are removed before these equipments are installed.
- 4.8.12** All equipments shall be handled very carefully to prevent any damage or loss. No bars, wire ropes, slings etc., shall be used for unloading and/or handling of the equipments with out the specific written permission of the Engineer. The equipment from the storage yard shall be moved to the actual site of erection/location at the appropriate time as per the direction of BHEL Engineer so as to avoid damage for such equipment at Site.
- 4.8.13** The Contractor shall take all reasonable care to protect the materials and work till such time the erected equipment has been taken-over by BHEL/their client. Whenever necessary suitable temporary fencing and lighting shall have to be provided by the Contractor as a safety measure against accident and damage of property of BHEL, suitable caution notices shall be displayed where access to any part may be deemed to be unsafe and hazardous.
- 4.8.14** The Contractor shall be responsible for taking all safety precautions during the constructions and leaving the site safe at the end of each working day and at all times. When the work is temporarily suspended, he shall protect all construction materials, equipments and facilities from causing damage to existing property interfering with the operation of the station when it goes into service. The contractor shall comply with all applicable provisions of the safety regulations, clean up programme and other precautionary measures, which the BHEL has in effect at the Site.
- 4.8.15** All lifting tackles including wire ropes, slings, shackles etc., used by the Contractor shall be got approved by BHEL Engineer at Site before they are actually put on the work.
- 4.8.16** The Contractor shall take delivery of equipment from storage yard/stores/sheds. He shall also make arrangements for verification of equipment, scrupulously maintain records and keep safe custody, watch and ward of equipment after it has been handed over to him till these are fully erected and tested and commissioned and taken over by BHEL's client. The stolen/lost/damaged good shall have to be made good by the contractor at his own cost.

4.9 PRESERVATION OF COMPONENTS

- 4.9.1** In order to maintain the surfaces of various components from rusting etc., frequent painting/re-painting of material at storage yard has to be carried out. Contractor has to arrange for supply

of paint/thinner etc., it is also shall be responsibility of Bidder/Contractor to provide sufficient number of unskilled category of labour for carrying out the preservative painting. The number of labour to be supplied will depend on the quantum of work awarded.

4.9.2 The above-referred labour will be given by the Contractor right through the contract period without fail and any failure on their part will entail in reduction of the value of their running bills.

4.9.3 It shall be the responsibility of the Contractor to apply preservative painting on equipments erected by him till such time of final painting. All paints and thinner will be supplied by CONTRACTOR and it shall be Contractor's responsibility to arrange for required labour, scaffolding materials, providing of scaffoldings, supply of cleaning materials like wire brush, emery sheets, etc., cleaning of surface and provide one coat of preservative painting from time to time as decided by BHEL Engineer. The quoted rate shall include this work also. It is to be noted that such painting may have to be done twice a year till such time the final painting is carried out.

4.9.4 The Contractor shall effectively protect the finished work from action of weather and from damage or defacement and shall cover the finished parts then and there for their protection.

4.9.5 Any failure on the part of the Contractor to carry out works according to above clauses will entail BHEL to carry out the job from any other party and recover the cost from the Contractor.

4.10 DRAWING AND DOCUMENTS

4.10.1 The detailed drawings, specifications, available with BHEL Engineers will form part of this Tender Specification These documents will be made available to the Contractor during execution of work at site.

4.10.2 One set of necessary drawings to carry out the erection work will be furnished to the Contractor by BHEL on loan, which shall be returned to BHEL Engineer at Site after completion of work. Contractor's personnel shall take care of these documents given to them.

4.10.3 Should any error ambiguity be discovered in the specification or information, the Contractor shall for with bring the same to the notice of BHEL before commencement of work BHEL's interpretation in such cases shall be final and binding on the Contractor.

4.10.4 The data furnished in various appendices and the drawings enclosed with this tender specification describes the equipment to be installed, tested and commissioned under this specification briefly. However, the changes in the design and in the quality may be expected to occur as is usual in any such large scales of work.

4.10.5 Deviation from design dimensions should not exceed permissible limit. The Contractor shall not correct or alter any dimension/details, without specific approval of BHEL.

4.11 SITE CLEANLINESS AND SAFETY REQUIREMENTS:

4.11.1 During the course of construction, alternation or repairs, scrap lumber with protruding nails, sharp edges etc., and all other debris shall be kept cleared from working areas, passageways and stairs in and around Site. Proper house keeping is the responsibility of the Contractor.

4.11.2 Combustible scrap and debris shall be removed at regular intervals during the course of construction. Safe means shall be provided by the Contractor to facilitate such removal. If this is not done regularly, BHEL will get the job done and debit the cost to Contractor.

- 4.11.3** Rigging equipments for material handling shall be inspected prior to use of each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service. Necessary test certificates have to be provided by the Contractor for the rigging and handling equipments brought by them. Otherwise this will be got to be done by BHEL and the cost will be debited to Contractor.
- 4.11.4** Rigging equipment shall not be loaded in excess of its recommended safe working load.
- 4.11.5** Rigging equipment when not in use shall be removed from the immediate work area so as not to present a hazard to employees.
- 4.11.6** The Contractor will notify the Engineer his intention to bring on to site any equipment or any container with liquid or gaseous fuel or other substance which may create a hazard. The Engineer shall have the right to prescribe the conditions under which such equipment or container may be handled and used during the performance of the works and the Contractor shall strictly adhere to such instructions. The Engineers shall have the right to inspect any construction plant and to forbid its use, if in his opinion it is unsafe. No claim due to such prohibition shall be entertained.
- 4.11.7** Where it necessary to provide and/or store petroleum products or petroleum mixture and explosives, the Contractor shall be responsible for carrying out such provision and/or storage in accordance with the rules and regulations laid down in the relevant petroleum Act., Explosive Act and Petroleum and Carbide of Calcium Manual, published by the Chief Inspectorate of Explosives of India. All such storage shall have prior approvals of Engineer. In case any approvals are necessary from the Chief Inspector of Explosives of any other statutory Authorities, the Contractor shall be responsible for obtaining the same.
- 4.11.8** Valve protection caps shall be in place and secured.
- 4.11.9** Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck or permitted to strike each other violently.
- 4.11.10** When cylinders are transported by powered vehicles, they shall be secured in vertical position.
- 4.11.11** All the hand lamps used by the contractors workmen shall be of 24V only. Adequate step down transformers should be installed at site to cater to the complete requirement. (230V hand lamps should not be used).
- 4.11.12** All workmen of the Contractor working construction areas shall wear safety helmets and/or safety belt when working at heights. Contractor shall insure his workmen against all accidents, and the policy shall be presented to BHEL will arrange the same and the expenditure towards this will be debited to the Contractor. In case the Contractor fails to provide necessary safety equipments to workmen, BHEL will provide the same to the workers and recover the cost of equipment along with BHEL overheads.
- 4.11.13** All the above safety conditions are not exhaustive but gives an idea for the Contractor and the Contractor shall adhere to all the safety precautions given by the BHEL Engineer at Site. Such of those workmen who do not follow safety precautions shall be turned out from Site. They will not be allowed to work until they fulfill safety regulations.
- 4.11.14** Contractor shall arrange at his cost suitable flood lighting arrangement at various levels for safe and proper working during night hours at the work spot as well as at the pre-assembly area.

- 4.11.15**The Contractor shall be responsible for provision of all the safety notices and safety equipments as enjoined on him by the application of relevant statutory regulations/provisions and/or as called upon by the BHEL Engineer from time to time.
- 4.11.16**The Contractor shall provide temporary fencing wherever required as a safety measure against accident and damage to properties. Suitable caution notices shall be displayed where access to any part is found to be unsafe and hazardous.
- 4.11.17**The Contractor shall ensure the safety of all the workmen, material and equipments either belonging to him or to others working at site.
- 4.11.18**It will be the responsibility of the Contractor to ensure safe lifting of the equipments, taking due precaution to avoid any accidents and damages to other equipments and personnel.
- 4.11.19**The Contractor shall provide necessary first aid facilities for all his employees, representatives and workmen working at Site.
- 4.11.20**All the Contractor's Supervisory personnel and sufficient number of workers shall be trained for fire fighting and shall be assigned specific fire protection duties. Enough number of such trained personnel must be available during the tenure of the Contract. Contractor should nominate one of his supervisors to co-ordinate and for implementation of safety measure.
- 4.11.21**Contractor shall provide enough fire fighting equipment of the types and numbers at his office, temporary structures, labour colony area etc. Access to such fire fighting equipment shall be easy and kept open at all times. Compliance of the above requirement under fire protection shall in no way relieve the Contractor of any of his responsibilities and liabilities to fire accident occurring.
- 4.11.22**The Contractor shall at his cost remove or on vicinity of work, all scrap packing materials rubbish unused and other materials and deposit them in places specified by BHEL engineer to keep the work Site clean and tidy.

4.12. TIME SCHEDULE

- 4.12.1 The entire work of erection, testing and commissioning of the under the scope of work shall be completed within the time specified in the time schedule.
- 4.12.2 Time is the essence of this contract. The contractor shall be able to mobilize his manpower, tools, plants and consumables round the clock for the entire period to complete the work within the stipulated time.
- 4.12.3 For this purpose the completion of erection work shall be deemed to be completed in all respects only when the trial runs of motors, charging of transformers, panels and instruments/equipments are completed and certified so by BHEL Engineer. The decision of BHEL in this respect shall be final and binding on the contractor.
- 4.12.4 The commissioning of the unit shall be deemed to be completed in all respects only when all the equipments are tested and commissioned and the Unit is ready for commercial operation.

4.13. IDLE LABOUR

- 4.13.1 No idle labour charges will be admissible in the event of any stoppage caused in the work resulting in contractor's labour being rendered idle due to any cause at any time.

4.14. PRICE ESCALATION:

- 4.14.1 The Contractor has to keep his quoted rates firm for the entire contractual period including total extended period, if any, and no claim for revision of rates is allowed under any circumstances.
- 4.14.2 However, the Contractor shall maintain sufficient work force and other resources required for completion of the job expeditiously for the entire contractual period including total extended period.
- 4.14.3 **OVER-RUN COMPENSATION** : In case due to unforeseen circumstances and due to reasons not attributable the Contractor, the work gets delayed and completion time gets extended as per Bar Chart from the date of actual start of work at Site, the Contractor shall not be entitled for any over run compensation for a period of first 3 months after the Contractual completion date. However, the contractor shall be paid over-run charges for extension in the completion period beyond 3 months as stated above and for reasons not attributable to the Contractor.
- 4.15 **INSPECTION / QUALITY ASSURANCE / QUALITY CONTROL STATUTORY INSPECTION**
- 4.15.1 Various inspection/ quality control/ quality assurance procedures/methods at various stages of erection and commissioning will be as per BHEL / customer quality control procedure/codes and the other statutory provisions and as per BHEL Engineers instructions.
- 4.15.2 Preparation of quality assurance log sheets and protocols with customer's engineers, and other quality control and quality assurance documentation as per BHEL engineer's instructions, with in the scope of work / specification.
- 4.15.3 The protocols between contractor and customer / BHEL shall made prior to installation for correctness of foundations, materials, procedures, at each stage of installation, generally as per the requirement of customer/BHEL. This is necessary to ensure elimination of errors or keeping them with in tolerable limits and to avoid accumulation and multiplication of errors.
- 4.15.4 A daily log book should be maintained by every supervisor/engineer of contractor on the job in duplicate (One for BHEL and one for contractor) for detailing and incorporating alignment/clearance/centering Levelling readings and inspection details.
- 4.15.5 Approval given by customer/BHEL for welding, results tests etc. shall also be recorded in the log book.
- 4.15.6 All the electrical/technical Measuring and Testing instruments / Gauges, Feeler gauges, Height Gauges , Dial Gauges, micrometers, Levels, Sprit Levels, surface Plates, Straight Edges, Vernier calipers and all measuring instruments shall be provided by the contractor for checking, Levelling, Alignment, testing etc of erected equipments at various stages. The instruments/ gauges/tools etc. provided should be Brand, quality and accuracy, specified by BHEL engineer and should have necessary calibration and other certificates as per the requirements of BHEL engineer.
- 4.15.7 Re-work necessitated an account of use of invalid instruments/measuring devices etc. shall be entirely to the contractor's account. The contractor shall be responsible for taking corrective actions, including resource augmentation if any, as specified by BHEL to make- up for the loss of time.
- 4.15.8 Total quality is the watch word of the work and standards, procedures laid down by BHEL. We shall follow all the instructions as per BHEL drawings and quality/standards. Contractor shall provide for the services of quality assurance engineer.
- 4.15.9 **STAGE INSPECTION BY FES/ QA ENGINEER:** Apart from Day-to-Day inspection by BHEL Engineers stationed at site and also by customers engineer's, stage inspection of

equipment under erection and commissioning at various stages of erection and commissioning by TEAMS of engineers, from field engineering services of BHEL's Manufacturing units and quality assurance unit/ factory quality assurance and commissioning engineers. Customer shall arrange all labour, Tools and tackles, etc. for such stage inspections free of cost.

- 4.15.10 Any modification suggested by FES and QA engineers team shall be carried out claims of contractor, if any shall be dealt as applicable.
- 4.15.11 Any minor rectifications of major repairs of defective work found out during stage inspection shall be rectified free of cost, by the contractor
- 4.15.12 Any major rectification or major repair/ major rework of defective work found out during stage inspection verification/checking but not attributable to contractor shall also be carried out. Claims of contractor if any, shall be dealt as applicable.

4.16. SUBMISSION OF PERIODICAL REPORTS

Contractor shall submit periodical reports in respect of following aspects of operation:

- 1) Consumption of welding electrodes and gases
- 2) Consumption of construction power
- 3) Manpower reports
- 4) Progress reports - periodically
- 5) Field calibration reports

BHEL at site will inform formats for these reports, which have to be printed by the contractor at their cost.

4.17 ELECTRICAL INSPECTORATE'S APPROVAL / STATUTORY COMPLIANCE

- 4.17.1** Contractor shall have/obtain electrical contractors License to carry out the Erection, Testing & commissioning work on High/Low voltage Electrical Equipments from the appropriate statutory authority of the concerned state or Central Electricity Authority, as the case may be. All fees and expenses in this regard shall be in the contractor's account.
- 4.17.2** Contractor shall arrange inspection of concerned statutory authority for the installation, testing & commissioning of High/Low voltage equipments covered under the scope of work and including those erected by other agencies and obtain the statutory authorities approval in appropriate format prior to charging of the equipments.
- 4.17.3** **Contractor shall be responsible for all necessary liasioning work with statutory authority** towards the certification of installation / works. BHEL will pay statutory fees in respect of inspection of installations as per demand note/challan issued by the statutory authority. All other expense shall be borne by the contractor. BHEL/BHEL's customer shall be providing technical assistance, drawing and document for submission to statutory authority. Contractor shall provide all logistics services in this regard.
- 4.17.4** In case these inspections have to be repeated due to Default/Fault of the contractor and fees have to be paid again, the contractor shall have to bear the charges. These would be deducted from their Bills.

SPECIAL CONDITIONS OF CONTRACT

SECTION - V

5.0 EXTRA CHARGES FOR MODIFICATION AND RECTIFICATION WORKS:

- 5.1 BHEL may consider payment for extra works on man-hour basis for such of those works which require major modification of the supplied components which is totally unusual to normal revamping / erection / commissioning work and which are not due to contractor's faulty erection.
- 5.2 The decision of BHEL in this regard shall be final and binding on the contractor. The contractor may submit his work claim bills (specifically agreed by BHEL Engineer) along with the labour sheets duly certified by BHEL Engineer at site. But BHEL may opt to get those work done through other agencies if they so desire.
- 5.3 All the extra works, if any, carried out should be done by a separate gang which should be identified prior to start of work for certification of man-hours. Daily labour sheets should be maintained and should be signed by the contractor's representative and BHEL Engineer. Signing of labour sheets does not necessarily mean the acceptance of extra works. Only those works which are identified as not usual to normal revamping / erection and certified so by the Site-in-Charge of BHEL and accepted by designers/supplier's competent authority only will be considered for payment. The decision of BHEL in this regard shall be final and binding on the contractor.
- 5.4 Average single manhour rate including overtime if any, supervision, use of tools and tackles and other site expenses and incidentals, **including consumables, if any required**, for carrying out any rework / rectification that may arise during the course of revamping shall be **Rs. 60/- per man hour**.
- 5.5 Extra works are broadly defined as below:
- i) Design changes which will be intimated to the contractor after the start of the work which call for dismantling of the erected components, rectification, modification, etc.
 - ii) Repair / rectification of the components damaged during transit and intimated to BHEL before drawing the materials from BHEL stores.
 - iii) Modification, rectification of components wrongly manufactured/fabricated at works subject to acceptance of the approving authority. Any such modification work costing less than 48 Man Hours per work of a DU shall be considered as incidental to erection and shall not be considered for payment.
 - iv) Jobs which require major modification, major repair, major reworks etc. which will be identified as major and warrant extra payment, certified as such by the Site-in-Charge of BHEL and accepted by the designers/competent authority of BHEL. The decision of BHEL in this regard shall be final and binding on the contractor.
 - v) The composite labour man hour rate towards extra works shall remain firm and not subject to any variation during execution of work. Price variation compensation (PVC), if any will not be applicable for extra works. Rate revision, Over-run charges / compensation etc. will not be applicable due to extra works.

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**SPECIAL CONDITIONS OF CONTRACT****SECTION – VI****6.0 OVER-RUN COMPENSATION (ORC):**

- 6.1 In case due to reasons not attributable to the contractor, the work gets delayed and the completion gets extended beyond the contract completion date by more than the grace period of 3 months, the contractor shall be paid Over Run Compensation for every month of extended period so determined by BHEL beyond the contract completion date (and the grace period) indicated in this specification.
- 6.2 ORC will be paid only at the end of the contract period, including extension/s of period if any, after ascertaining the actual period of eligibility of delay as aforesaid. For this purpose, the contractor shall submit details of factors with time estimates which accounted for the delay in work completion.
- 6.3 All decisions of BHEL in this regard shall be final and binding on the contractor. The period to be considered for ORC shall not include loss of time due to Force-majeure conditions explained in this tender.
- 6.4 The ORC shall be paid by BHEL only after completion of all works within the scope of the works awarded to the Bidder. Hence, it is obligatory on the part of the Bidder to complete the works during extended period also.
- 6.5 This supplements the clause 5.12 of Special conditions of Contract for Mechanical works - V enclosed along with this tender specification.
- 6.6 The rate of ORC payable per month shall be Rs.35000/- only . It is mandatory on the part of the contractor to maintain a minimum of 04 workmen during the ORC period. The total Over-run compensation shall be limited to 5% of the executed contract value, as certified in the Final Bill. For this purpose executed contract value excludes Price variation compensation (PVC), ORC, Supplementary / Additional items and Extra works done on manday/hr rate basis. The total eligibility period will be determined by BHEL.

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SPECIAL CONDITIONS OF CONTRACT**SECTION – VII****7.0 GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION**

- 7.6 For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
- 7.7 BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on Internet.
- 7.8 BHEL will inform the vendor in writing, in case of reverse auction, the details of service provider to enable them to contact and get trained.
- 7.9 Business rules like event date, time, start price, bid decrement, extensions, etc. also will be communicated through service provider for compliance.
- 7.10 Vendors have to fax the compliance form in the prescribed format (provided by service provider) before start of Reverse auction. Without this the vendor will not be eligible to participate in the event.
- 7.11 BHEL will provide the rate schedule (e.g. EXCEL sheet) for the vendor to enable them to fill-in the price and keep it ready for keying in during the auction. In the event of discrepancy in rate and amount against any item of work, the least of the two will be taken for bid price. In case of discrepancy between the total price indicated in price bid and the arithmetic sum arrived based on rate quoted, then also the least of the two will be taken for the bid price. The bids are compared on the total price quoted and NOT on individual ITEM of works.
- 7.12 Reverse auction will be conducted on scheduled date & time.
- 7.13 At the end of reverse auction event, the lowest bidder value will be known on the network.
- 7.14 The lowest bidder has to fax the duly signed filled-in prescribed format as provided on case-to-case basis to BHEL through Service provider within 24 hours of auction without fail.
- 7.15 Opening bid in reverse Auction: The opening bid (in the reverse Auction) of the bidders shall be same as that quoted in their final sealed price submitted to BHEL(along with Technical offer). The bidder shall confirm in writing to BHEL that their opening bid (in reverse auction) shall be same as that quoted in their final sealed price bids submitted to BHEL against this NIT along with Technical Bid (Patr-1).**If any bidder offered a unsolicited discount or rebate, in separate cover etc. in any place other than the sealed price bid, then the opening price bid in reverse auction, by such a bidder in Reverse Auction, shall be the price offered in final sealed price bid submitted (against this NIT) minus discount offered in any place other than the sealed price bid.**
- 7.16 BHEL reserves the right to cancel Reverse Auction (RA) without assigning any reasons and resort to considering the sealed bids submitted by vendor for processing and finalizing the tender.

- 7.17 In case the process of reverse auction is found unsuccessful by BHEL, then BHEL at its discretion may decide to call the L1 bidder of reverse auction for further negotiation.
- 7.18 Any variation between the on-line bid value and signed document will be considered as sabotaging the tender process and will invite disqualification of vender to conduct business with BHEL as per prevailing procedure.
- 7.19 In case BHEL decides not to go for Reverse auction procedure for this tender enquiry, the Price Bids and price impacts, if any already submitted and available with BHEL shall be opened as per BHEL's standard practice.
- 7.20 Only those vendors, who participate in the Online Initial Opening Bid, will be eligible to participate in the subsequent Online English Reverse Auction.
- 7.21 Price bids offered by the bidders during reverse auction process is considered as an offer to execute the work. Bids once made by a bidder cannot be cancelled/withdrawn and bidders shall be bound to execute the work at the final bid price. BHEL shall take appropriate action if the bidder fails to do so.
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STATUTORY REQUIREMENT

OF

CONTRACT

(FORMATS & PROCEDURES)

ES : F : 009



R 05- 275

ERECTION SERVICES DEPARTMENT
BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
BOILER AUXILIARIES PLANT
INDIRA GANDHI INDUSTRIAL COMPLEX
RANIPET – 632 406

**BHARAT HEAVY ELECTRICALS LIMITED
BOLIER AUXILIARIES PLANT
INDIRA GANDHI INDUSTRIAL COMPLEX
RANIPET –632 406.**

TENDER SPECIFICATION NO. BAP:ERN:NSPCL:ESP:ELEC:C:235

CHECK LIST

Bidders are required to fill in the following details:

- | | |
|---|-------------------|
| 1. a. Name of the Bidder | : |
| With address,
Phone No., Mobile No., Fax and e-mail. | |
| b. Nature of Firm | : |
| 2. Whether EMD submitted as per tender
Specification Terms and conditions | : YES / NO |
| 3. Validity of offer (offer shall be kept valid for
acceptance for a period of minimum 6 months) | : YES / NO |
| 4. Whether Bidder visited the erection Site and
acquainted with Site Conditions before quoting | : YES / NO |
| 5. Whether the following details are furnished. | |
| a. Previous Experience – Photocopies as in QR | : YES / NO |
| b. Present assignments | : YES / NO |
| c. Organization chart of the Company | : YES / NO |
| d. Financial status of the Company | : YES / NO |
| e. In case of Company, proof of
registration of the Company | : YES / NO |
| f. Memorandum and Articles of Association of
Company / copy of Partnership Deed. | : YES / NO |
| g. Profit and Loss Account For the last three Years | : YES / NO |
| h. Balance sheet for the last three years | : YES / NO |
| i. Income Tax clearance Certificates | : YES / NO |
| j. Solvency Certificate from a Nationalized Bank | : YES / NO |
| k. Power of Attorney of the person signing the tender
duly attested by a Notary Public | : YES / NO |

- l. Names and addresses of Directors, Partners their Experience and qualification : YES / NO**
- m. Manpower Organization chart and Tools list with deployment plan at Site for satisfactory completion of work under this specification : YES / NO**
- n. EPF registration No. (with a copy of certificate) : YES / NO**
- o. Service Tax registration No. (with a copy of certificate) : YES / NO**
- p. E- payment acceptance as per appendix. : YES / NO**
- q. Rate schedule as per the schedule appended : YES / NO**
- 6. Whether the Bidder is conversant with local labour laws and conditions : YES / NO**
- 7. Whether the Bidder is aware of all safety Rules and codes. : YES / NO**
- 8. Whether the declaration sheet (as per appendix enclosed) filled : YES / NO**
- 9. Whether the erection schedule (as per appendix enclosed) furnished : YES / NO**
- 10. Whether all the pages are read, understood and signed : YES / NO**

SIGNATURE OF BIDDER

NOTE : The Bidders are requested to peruse the Tender Specification terms and conditions carefully and furnish the above information also in detail as required.

OFFER OF THE BIDDER
(FORMAT - To be typed written in LETTER HEAD and submitted along with offer)

To

The Dy. General Manager
Erection Services Dept,
Bharat Heavy Electricals Limited,
Boiler Auxiliaries Plant,
Indira Gandhi Industrial Complex,
RANIPET –632 406. (TAMIL NADU).

Sir,

I/We hereby offer to carry out the work detailed in the Tender Specification No. BAP:ERN:NSPCL:ESP:ELEC:C:235 issued by M/s. Bharat Heavy Electricals Limited, Boiler Auxiliaries Plant, Ranipet in accordance with the terms and conditions thereof:

I/ we have carefully pursued the following documents connected with the above work and agree to abide by the same. We herewith confirm that we have visited the site of work at NSPCL, Rourkela.

- a. General terms and conditions of work (ES: F:010)
- b. Statutory requirement of Contract (ES: F:009)
- c. Special conditions of Contract for Electrical works (BAP:ERN:ELEC:SPN:01)
- d. Tender Specification no. BAP: ERN:NSPCL:ESP:ELEC:C:235
- e. Special Instructions to Bidder
- f. General terms and conditions of Reverse Auction.
- h. Other sections, appendices, schedules and drawing.

I/We have deposited / forwarded herewith the Earnest Money Deposit in the form prescribed and as stipulated in Clause No.1.4. of the General Conditions of Contract for Works towards the Earnest Money Deposit for a sum of **Rs.1,50,000/- (Rupees One Lakh Fifty Thousand only)** vide Pay Order No.....Dt..... 2013 / Demand Draft No.....dt..... 2013 which shall be refunded should our offer not be accepted. Should our offer be accepted, I/We further agree to deposit such additional sum, within the stipulated time as may be indicated by BHEL, which along with the sum of **Rs.1,50,000/-** mentioned above, shall make up the Security Deposit for the work as provided for in clause 1.8.2 of the General Conditions of Contract for Works.

I/We further agree to execute all the works referred to in the said documents upon the terms and conditions contained or referred to therein and as indicated in the Annexure enclosed thereto.

SIGNATURE OF BIDDER:

Place:
Date:

ADDRESS:

WITNESSES WITH FULL ADDRESS

SIGNATURE	NAME	ADDRESS
1)		
2)		
3)		

TENDER SPECIFICATION No. : BAP:ERN:NSPCL:ESP:ELEC:C:235

(FORMAT - To be typed written in LETTER HEAD and submitted along with offer)

CERTIFICATE OF NO DEVIATION

I / Weof M/s
hereby certify that there is no deviation from the Tender conditions either technical
or commercial and I am / We are agreeing to all the terms and conditions mentioned
in the Tender Specification (No. : BAP:ERN:NSPCL:ESP:ELEC:C:235).

Date :

SIGNATURE OF THE BIDDER

TENDER SPECIFICATION No. : BAP:ERN:NSPCL:ESP:ELEC:C:235

(FORMAT - To be typed written in LETTER HEAD and submitted along with offer)

DECLARATION SHEET

I,
hereby certify that all the information and data furnished by me with regard to this Tender Specification No. BAP : ERN : NSPCL : ESP: ELEC: C :235 are true and complete to the best of my knowledge. I have gone through the specification, conditions and stipulations in detail and agree to comply with the requirements and intent of specifications. Further certify that I am duly authorized representative of the under mentioned Bidder and a valid power of Attorney to this effect is also enclosed.

BIDDER'S NAME AND ADDRESS:

AUTHORISED REPRESENTATIVE'S SIGNATURE
WITH NAME AND ADDRESS

FINANCIAL VIABILITY

1. **Owner's Capital in the business**
(In case of Partnership please : Rs.
Mention percentage of shares and
Amount)
2. **Quantum of business done during : Rs.**
Last three financial years.
 - 1.
 - 2.
 - 3.
3. **Value of Fixed Assets of the : Rs**
business in last three years
 - 1.
 - 2.
 - 3.
4. **Guarantee limits (if any) : Rs.**
Enjoyed by the firm
5. **Overdraft limits (if any) : Rs.**
Enjoyed by the firm
6. **Income Tax paid during the last
three Years : Rs.**
7. **Please state whether audited :
profit and Loss Account and
Balance Sheet for last 3 Years
and Solvency Certificate are
Enclosed.**

Signature of the Bidder

ORGANISATION STRUCTURE

1. **Management structure of the firm:**
Whether public limited / Private Limited / Sole Proprietorship / Partnership.
2. **Details of the staff presently on permanent rolls of the organization.**
 - a) **Engineering / Supervisory Staff.**
Quote Experience in types of works as well as number of years in each.

Sl. No.	Name and Designation	Qualification	Experience	Proposed to be deployed at Site for this job	Remarks if any

Signature of the Bidder

b) Details of Technical staff:

Sl. No.	CATEGORY	Total Number on Experience Rolls	Numbers Proposed to be deployed at site for this job
01.	Supervisors / Foreman		
02.	Store Keepers		
03.	Electrician		
04.	Fitters		
05.	Welders		
06.	Sarang		
07.	Rigger		
08.	Painter		
09.	Light Vehicle Driver		
10.	Heavy vehicle Driver		
11.	Semi-skilled worker		
12.	Unskilled Worker		
13.	Crane Operators		
14.	Crane Maintenance Staff		
15.	Other vehicles maintenance staff		
16.	Other category of staff, if any		

Signature of the Bidder

FACILITIES FOR STAFF & WORKERS AT SITE

1. ACCOMMODATION:

a) For Engineer / Supervisor / other staff

Sl. No.	Category	Type of accommodation	Facilities provided	Remarks if any
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b) No. of quarters, plinth area of each quarter and estimated cost proposed to be constructed for workmen.

1. MEDICAL:

2. CONVEYANCE:

3. OTHER AMENITIES:

Signature of the Bidder

SCHEDULES TO BE FURNISHED BY THE BIDDER

1. Bidder shall submit the following technical proposal documents (a detailed write-up on his erection plan) along with the offer indicating the proposal to achieve the milestone dates, giving details of erection sequence, manpower deployment plan and T&P deployment plan for the various erection activities. The bidder shall submit histograms for Equipment, Staff and Labour to be deployed on the Work.
2. Bidders are required to submit details for the above. Bids received without above are liable to be rejected.

3. The Bidder is required to submit the following schedules along with the offer.

Schedule A:

PERT / CPM Bar Chart showing Work Breakdown Structure, time schedule and Milestone dates

Schedule B:

Schedule of Plant, Equipment and Tools

Schedule C:

Schedule of Project Staff (identifying skill and work area)

Schedule D:

Schedule of Labour -Day wise deployment of skilled / semiskilled / unskilled and other categories of workers to suit the above programme.

Schedule E:

List of Documents submitted towards proof of meeting the requirements of Technical Evaluation Criteria.

SCHEDULE 'G

Construction power / electricity required for / Office / stores / workshop sheds, etc. of the Bidder in the following format.

a) Construction power required

<u>Average</u>	<u>Peak</u>
----------------	-------------

Amp

KVA

b) Electricity required for Office & Storage sheds

<u>Average</u>	<u>Peak</u>
----------------	-------------

Amp

KVA

4. Tender offers are liable to be rejected in the event of non-submission of above schedules along with the offer complete with all the details asked for.

Note: Contractor may also indicate their ability in completing the contract in a period shorter than that mentioned.



ANALYSIS OF UNIT RATE QUOTED (Only Percentages to be Quoted)

Sl. No.	Description	Percentage of the unit rate quoted	Remarks if any
01.	Site facilities viz. electricity, water, workshop and other infrastructure facilities		
02.	Salary & wages for staff and workers		
03.	Consumables		
	a) Gases		
	b) Electrodes		
	c) Steel materials		
	d) Others		
04.	Depreciation and maintenance for T&P, other items		
05.	Establishment and Administration expenses of sites		
06.	Retrenchment benefit		
07.	Overheads		
08.	Extra work incidental to erection		

NOTE: All Bidders are requested to take care that the rates quoted by them are not disclosed in any way while furnishing the above details.

Signature of the Bidder

A - 1

STATUS OF TOOLS & PLANTS

List of equipments / Machinery / T&P owned by the contractor and proposed to be deployed by the contractor for this work.

NOTE: Bidders are required to furnish the details as desired below with regard to the equipments machinery, tools & plants, consumables and workshop facilities owned by them along with documentary proof for the same.

Sl. No.	Name of the equipment	Total Qty. Available	Quantity Proposed to be Deployed	Type Capacity Specification	Year of make	Date of Purchase	Registration Number	Present Location	Utility Factor of the Machine
1	2	3	4	5	6	7	8	9	10

01 Details of Tools & Tackles / Measuring instruments / equipment given in Apendix - I

02 18T / 14T /12T / 10 T Capacity Mobile crane

03 5T or 8T Capacity fork-lift or Hydromack

04 Tractor Trailors

05 Trucks

06 Wooden sleeper

07. DC Welding Generator / Welding transformer with cables

Signature of the Bidder

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

08. Electrical winches

09. Hand winches

10. Hydraulic Torque wrenches

11. Electrode drying oven

12. Portable electrode drying oven

13. Spur gear chain pulley block

14. Gas cutting set with hoses

15. Hydraulic jacks

16. Low voltage 24V transformer
with Hand lamps

17. Single sheave snatch pulley blocks

18. 3T Capacity D shackle

19. 5T Capacity D shackle

20. Portable grinders

21. Peumatic drill ½" & 1"

22. Torque wrenches

23. Steel wire ropes for guy ropes

Signature of the Bidder

B-I

ANALYSIS OF SIMILAR JOBS EXECUTED / IN PROGRESS IN THE LAST SEVEN YEARS

Sl. No.	Details of Jobs executed / In progress With location of projects	Financial value of the contracts	Number of Strikes / work stoppages with duration and mandays Lost during Execution of job	Number of accidents (fatal / Minor)	Details of insurance provided for the workers for accidents / deaths	Details of safety equipments provided to workers
1	2	3	4	5	6	7

Signature of the Bidder

B – II

(FOR ESP PROJECTS ONLY)

Sl. No.	Name of the Project with unit capacity	Date of letter of Intent	Date of start of erection	Date of collecting electrode Loading	Trial run of rapping motors	Date of air tightness test	Date of GD test	Testing & commissioning
1	2	3	4	5	6	7	8	

Signature of the Bidder

APPENDIX – II**(To be filled by Bidder and submitted along with Tender document)**

S.No.	PARTICULARS	YES	NO
01	SERVICE TAX		
a.	Service Tax Registration No. of Bidder (copy to be enclosed)		
b.	Issue of Service Tax Invoice as per Rule 9 of Cenvat Credit rules2004		
c.	Whether Bidder is taking Service Tax Credit for their Inputs		
d.	Under which Service Head is Service provided		
e.	If Service Tax is Exempted , furnish reasons		
f.	BHEL Service Tax Registration No. (To indicate in your Invoice) : AACB/4146/PST/008		
02	INCOME TAX		
a.	PAN No. of Bidder		
b.	If Exempted , furnish exemption Certificate		
c.	PAN No. of BHEL : AAACB/4146/P		
03	WC ST		
a.	CST Registration No.		
b.	VAT Registration No.		
c.	Whether Bidder is availing VAT Credit		
d.	If Exempted , furnish Reasons		
	NOTE :		
	1. Erection & Commissioning Part : Rates Quoted for shall be clearly indicated that they are INCLUSIVE of all Taxes & Duties except service tax. The Contractor has to issue invoice accordingly. Also refer clause 16.0 of Tender specification.		
	2. Supply Part : VAT / CST shall be quoted separated as indicated in Price bid.		
	3. Payment will be made only through e-payment to your account. Payment through Cheque / DD payment will not be made by BHEL.		
Bidder has to submit Banker's Certificate as per format specified in APPENDIX- IV.			
Agreed to the Above Conditions			
Signature of the Bidder :			

APPENDIX – III**ACCEPTANCE FOR ELECTRONIC FUND TRANSFER / RTGS TRANSFER**

01	NAME & ADDRESS OF THE SUPPLIER / VENDOR	
02	VENDOR CODE (as in Work Order)	<input type="text"/>
03	Details of Bank Account:	
A)	NAME & ADDRESS OF THE BANK (WITH PIN CODE)	
B)	BANK TELEPHONE NUMBER (WITH STD CODE)	<input type="text"/>
C)	BANK BRANCH CODE	<input type="text"/>
D)	MICR CODE	<input type="text"/>
E)	ACCOUNT NUMBER	<input type="text"/>
F)	TYPE OF ACCOUNT	CURRENT A/C / OD / CASH CREDIT
G)	VENDOR NAME AS PER BANK RECORDS	
H)	BANK BRANCH RTGS IFSC CODE	<input type="text"/>
I)	BANK BRANCH NEFT IFSC CODE	<input type="text"/>
J)	VENDOR'S EMAIL ID (give two ids)	<input type="text"/>
K)	NAME OF AUTHORISED SIGNATORY	

CERTIFICATE

I / We hereby agree to receive the payments due from BHARAT HEAVY ELECTRICALS LIMITED, RANIPET by the National Electronic Funds Transfer and/or RTGS Transfer mode by credit to my / our above mentioned Bank Account. I / We also agree that payments made to the above mentioned Account is a valid discharge of the liability of Bharat Heavy Electricals Limited, Ranipet. I / We also agree to bear the applicable Bank Charges for the above mode of transfer.

AUTHORISED SIGNATORY OF VENDOR WITH SEAL

Banker's Certification

We confirm that we are enabled for receiving RTGS and NEFT credits and we further confirm that the account number of _____ (name of account holder), the signature of the authorized signatory and the MICR and IFSC codes of our Branch mentioned above are correct.

PLACE:

DATE:

(Manager / Officer's)
signature Under Bank stamp
Authorisation No. _____

Note: This EFT form is to be submitted duly filled in manually in all fields and dully signed by Authorized Signatory and certified by Banker

APPENDIX – IV**Certified by Chartered Accountant on letter head**

This is certify that M/s,
 (hereinafter referred to as 'company') having its registered office at
 is registered under MSMED Act 2006, (Entrepreneur
 Memorandum No (part-II) dtd :.....
 Category:.....(Micro/Small).(Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as on date
 as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.1722(E) dated 5, 2006 :
 Rs..... Lakhs
2. **For Services Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
 Rs..... Lakhs

The above investment of Rs..... Lakhs is within permissible limit of
 Rs..... Lakhs for Micro/Small (**Strike off
 which is not applicable**) Category under MSMED Act 2006.

Date:

(Signature)

Name –

Membership Number –

Seal of Chartered Accountant

The MLDBs and SLDBs for illumination shall be designed, manufactured and supplied along with MCBs, internal wiring, bus bar arrangement, fixing hard wares etc. The MLDB and SLDB shall be designed as per the following specifications.

MAIN LIGHTING DISTRIBUTION BOARD (MLDB)

Application	:	Power supply from LTMSB to SLDB
No: of boards	:	1
No: of incomers	:	1
Rating of incomer	:	125 A MCB (4 pole)
Incoming cable gland	:	1 no: suitable for 3C-16 sqmm power cable
Cable lugs	:	Suitable for 1 run of 3C-16 sqmm power cable
No: of outgoing feeders	:	5
Rating of outgoing feeders	:	63 A MCB (4 pole)
Outgoing cable gland	:	5 no:s suitable for 4C-2.5 sqmm power cable
Cable lugs (crimping type)	:	Suitable for 1 run of 4C-2.5 sqmm power cable for all outgoing feeders
Degree of protection	:	IP 55

The R, Y & B phases shall be connected through insulated Cu bus bar arrangement.

SUB LIGHTING DISTRIBUTION BOARD (SLDB)-1

Application	:	Power supply from MLDB to individual feeders
No: of boards	:	1
No: of incomers	:	1
Rating of incomer	:	40 A MCB (4 pole)
Incoming cable gland	:	1 no: suitable for 4C-2.5 sqmm power cable
Cable lugs	:	Suitable for 1 run of 4C-2.5 sqmm power cable
No: of outgoing feeders	:	12
Rating of outgoing feeders	:	15 A MCB (2 pole)
Outgoing cable gland	:	12 no:s suitable for 2C-2.5 sqmm power cable
Cable lugs (crimping type)	:	Suitable for 1 run of 2C-2.5 sqmm power cable for all outgoing feeders
Degree of protection	:	IP 55

All looping between MCBs in SLDB shall be done with 2.5 sqmm insulated wire of 660V grade.

SUB LIGHTING DISTRIBUTION BOARD (SLDB)-2

Application	:	Power supply from MLDB to individual feeders
No: of boards	:	1
No: of incomers	:	1
Rating of incomer	:	40 A MCB (4 pole)
Incoming cable gland	:	1 no: suitable for 4C-2.5 sqmm power cable
Cable lugs	:	Suitable for 1 run of 4C-2.5 sqmm power cable
No: of outgoing feeders	:	6
Rating of outgoing feeders	:	15 A MCB (2 pole)
Outgoing cable gland	:	6 no:s suitable for 2C-2.5 sqmm power cable
Cable lugs (crimping type)	:	Suitable for 1 run of 2C-2.5 sqmm power cable for all outgoing feeders
Degree of protection	:	IP 55

All looping between MCBs in SLDB shall be done with 2.5 sqmm insulated wire of 660V grade.

SUB LIGHTING DISTRIBUTION BOARD (SLDB)-3

Application	:	Power supply from MLDB to individual feeders
No: of boards	:	1
No: of incomers	:	1
Rating of incomer	:	40 A MCB (4 pole)
Incoming cable gland	:	1 no: suitable for 4C-2.5 sqmm power cable
Cable lugs	:	Suitable for 1 run of 4C-2.5 sqmm power cable
No: of outgoing feeders	:	9
Rating of outgoing feeders	:	15A MCB (2 pole) for 6 outgoing feeders and 25A MCB (2 pole) for remaining 3 outgoing feeders.
Outgoing cable gland	:	12 no:s suitable for 2C-2.5 sqmm power cable.
Cable lugs (crimping type)	:	Suitable for 12 runs of 2C-2.5 sqmm power cable.
Degree of protection	:	IP 55

All looping between MCBs in SLDB shall be done with 2.5 sqmm insulated wire of 660V grade.

GENERAL

The LDBs shall be made of 2 mm CRCA and shall be hot dip galvanized. The mass of zinc coating shall not be less than 610gm/Sqm. The LDBs shall be suitable for mounting on walls, columns, structures etc. Hot dip galvanized fixing hard wares like bolts, nuts, washers etc shall also be supplied. Neoprene gaskets or EPDM gaskets shall be provided for the LDB to suit IP 55. Door shall have opening with locking arrangement. Cable entry shall be from bottom. Suitable earthing provisions shall be provided for the LDBs.

METAL CLAD SOCKET

The 5A, 20A & 63A sockets shall be metal clad with switch. The switched sockets shall have provision for earthing at two different points and shall be suitable for wall mounting. Necessary mounting arrangements shall be provided along with the socket. The switched socket shall have provision to close the pin points in the event of non operation. 20A & 63A switched sockets shall have provision to have 5 pin arrangement. All sockets shall be provided with enclosures to meet IP 55 degree of protection. The sockets shall be fitted with sufficient no: of glands for incoming cables as per the following:

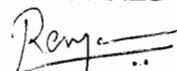
- 5A – 1 X 2C-2.5 sqmm cable
- 20A – 2 X 2C-2.5 sqmm cable
- 63A – 1 X 3C-35 sqmm cable

MAKE OF COMPONENTS

MCB	:	L&T/ SEIMENS/ MDS/ S&S/ SCHNEIDER/ INDO-ASIAN/ GE
CABLE GLANDS	:	COMET/ BRACCO/ ARUP ENGG./ QPIE/ SUNIL & Co
CABLE LUGS	:	DOWELL
PVC WIRES	:	ISI (BIS) APPROVED/ CERTIFIED MAKES

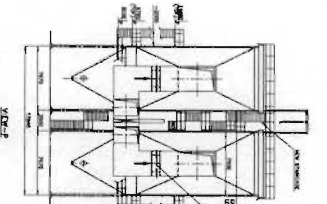
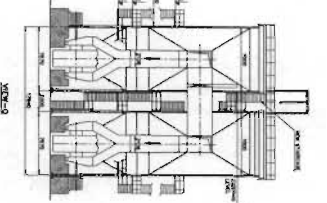
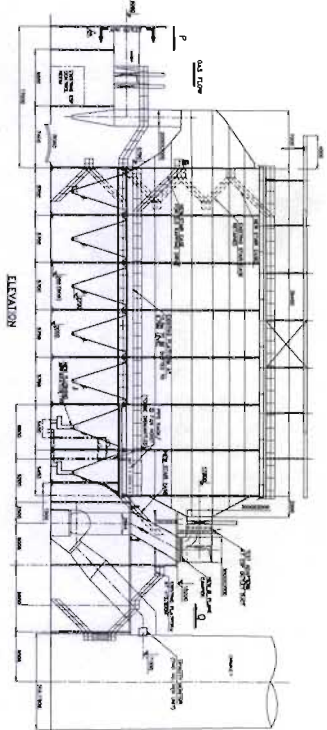
All other items in the enquiry shall be of reputed make.

PREPARED BY

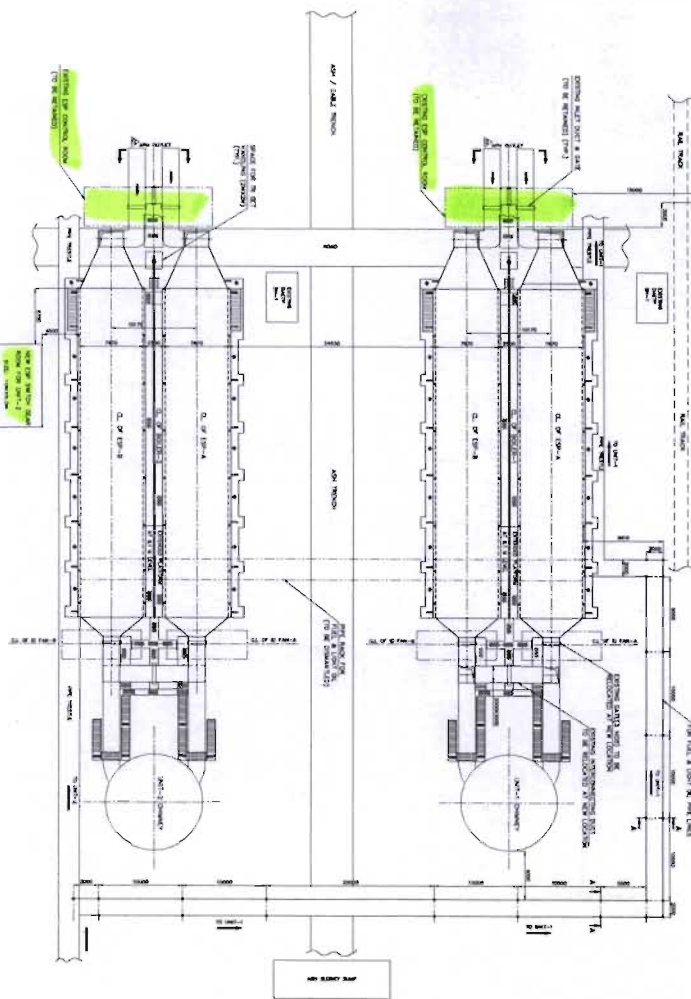

REMYA

APPROVED BY


S RANGARAJAN



SECTION-AA
(NOT TO SCALE)



FLOOR PLAN

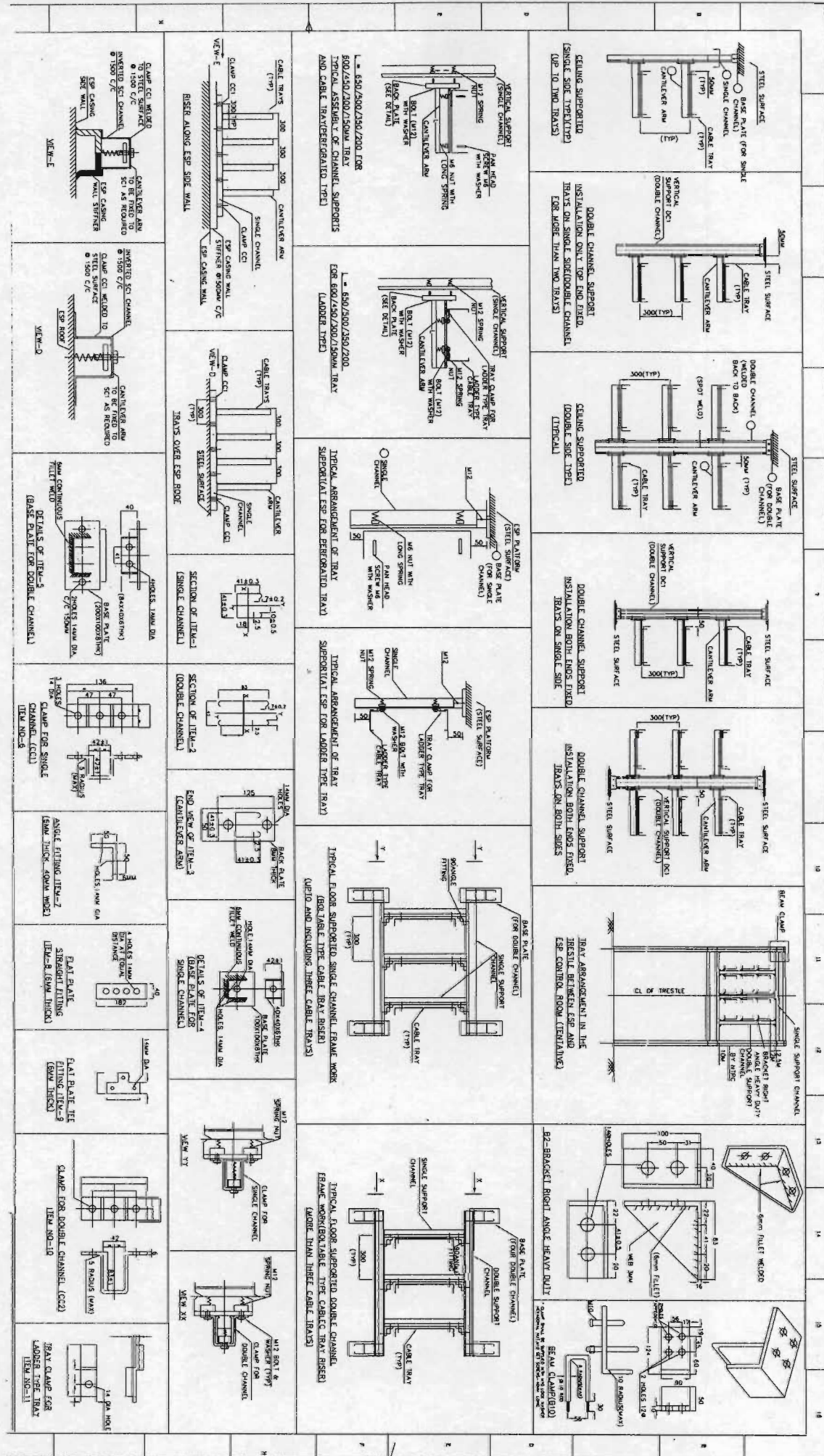
FOR REFERENCE
PURPOSE ONLY

- NOTES:**
1. GENERAL BUILDINGING OF WORK.
 2. SEE DRAWING FOR ALL NOTES.
 3. SEE DRAWING FOR ALL NOTES.
 4. SEE DRAWING FOR ALL NOTES.
 5. SEE DRAWING FOR ALL NOTES.
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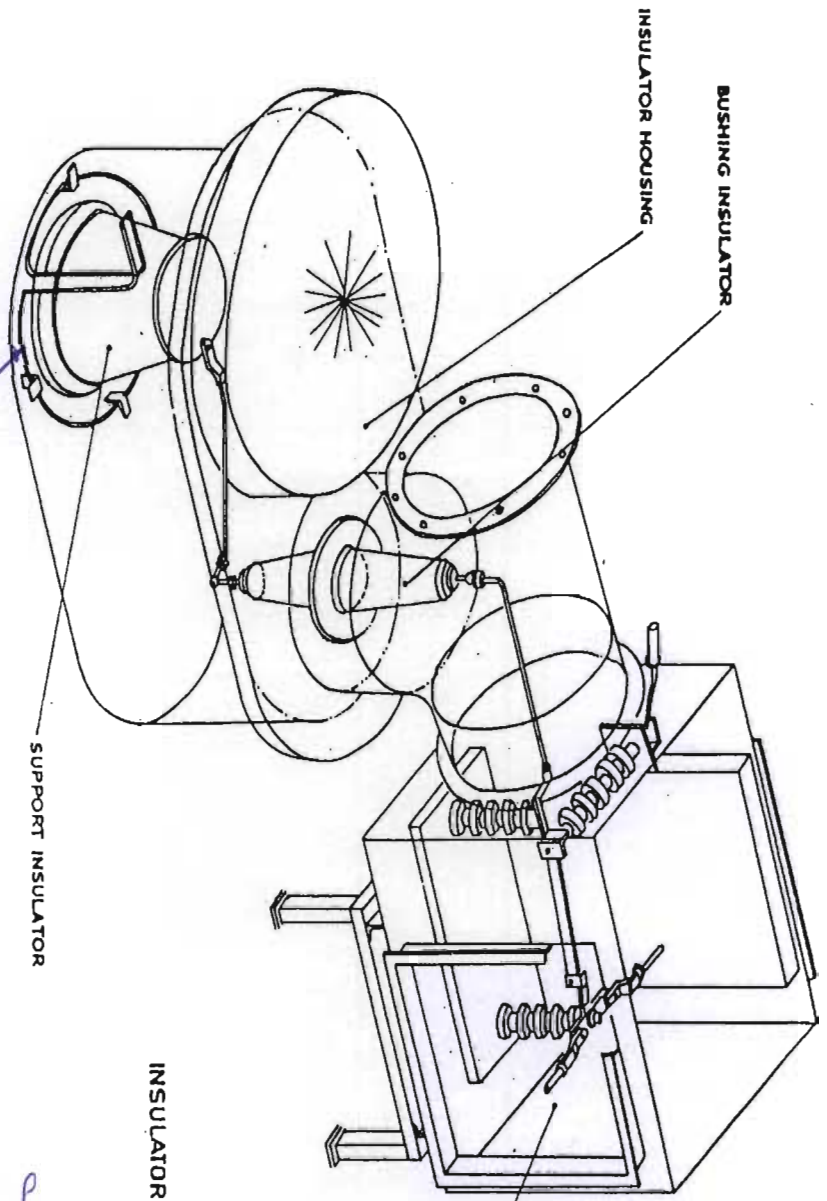
NO.	DATE	DESCRIPTION
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3	12/21/22	ISSUED FOR PERMITS
4	12/21/22	ISSUED FOR PERMITS
5	12/21/22	ISSUED FOR PERMITS
6	12/21/22	ISSUED FOR PERMITS
7	12/21/22	ISSUED FOR PERMITS
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19	12/21/22	ISSUED FOR PERMITS
20	12/21/22	ISSUED FOR PERMITS

Sukant
K Sahoo

12/21/22



TYPICAL FLEXIBLE CABLE TRAY SUPPORT SYSTEM

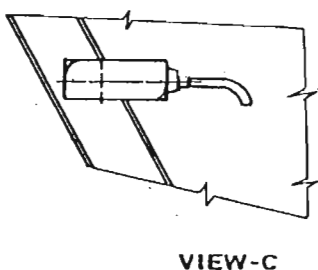
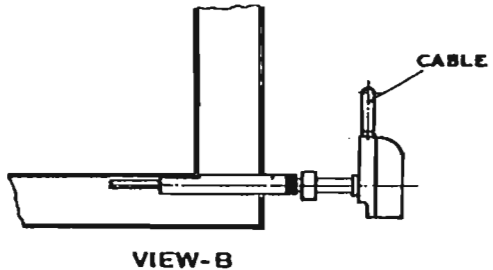
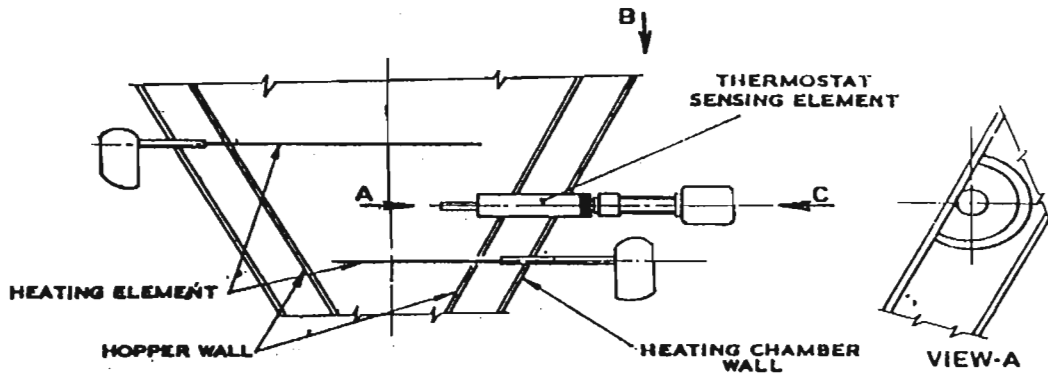


Support
Shoulder
Heads

FIGURE 79

INSULATOR HOUSING ASSEMBLY

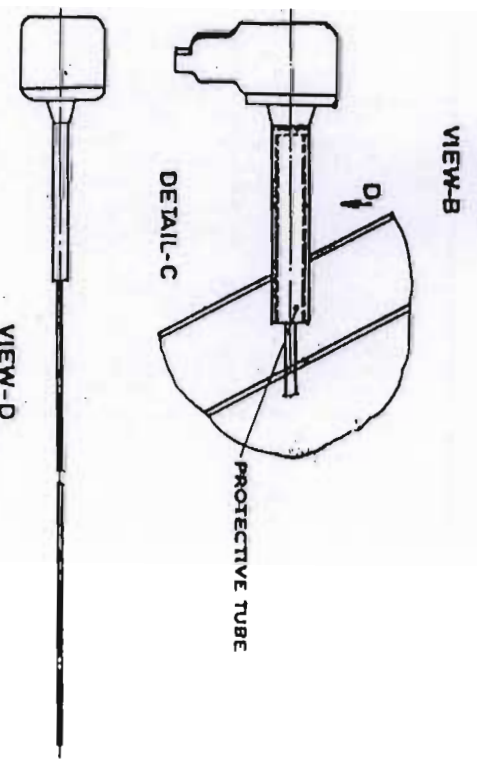
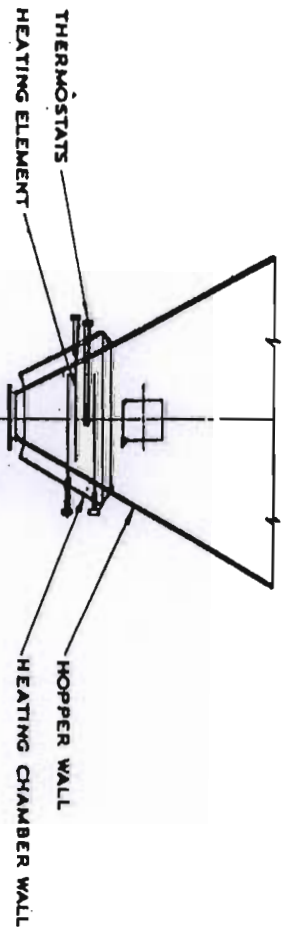
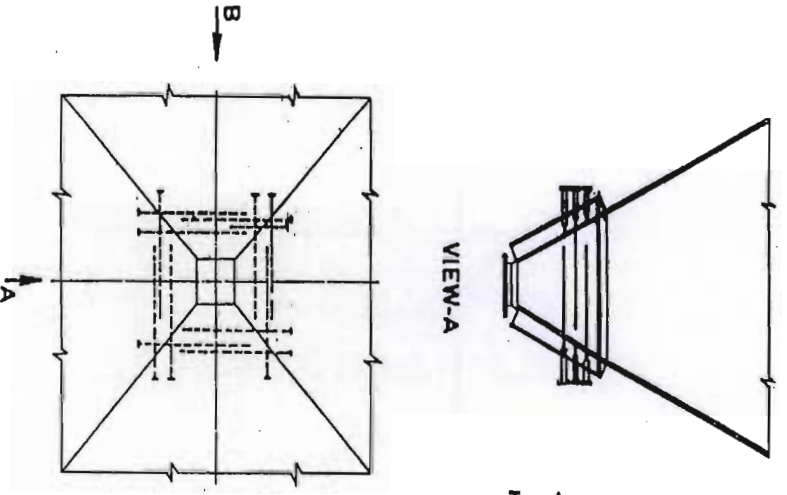
TYPICAL ARRANGEMENT.
ONLY FOR REFERENCE
PURPOSES.



TYPICAL FIXING DETAIL OF THERMOSTAT FOR HOPPERS.

ONLY FOR REFERENCE PURPOSES.

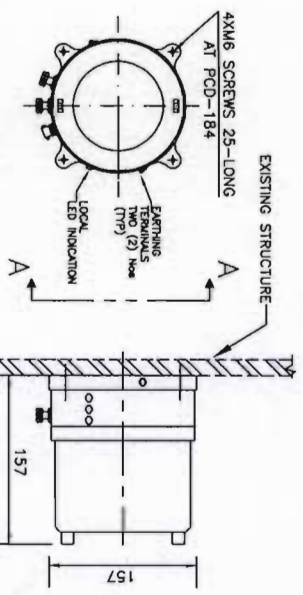
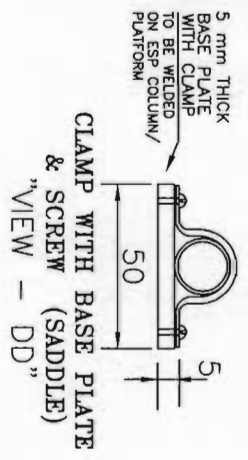
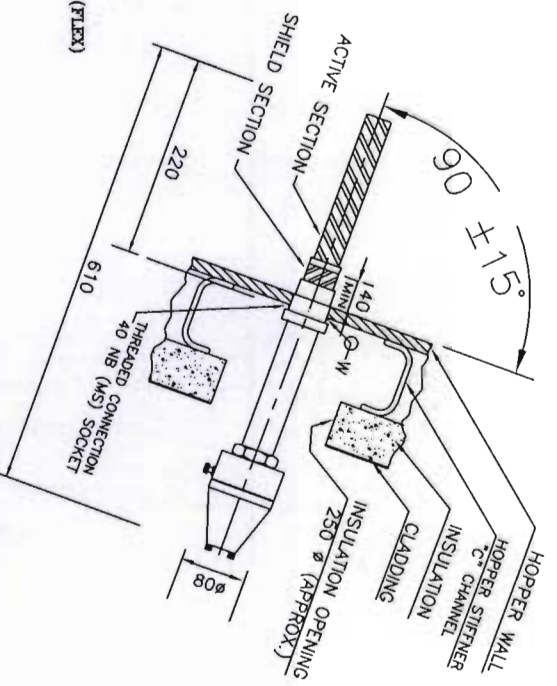
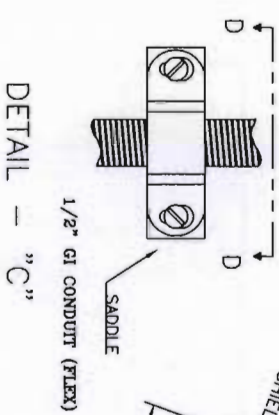
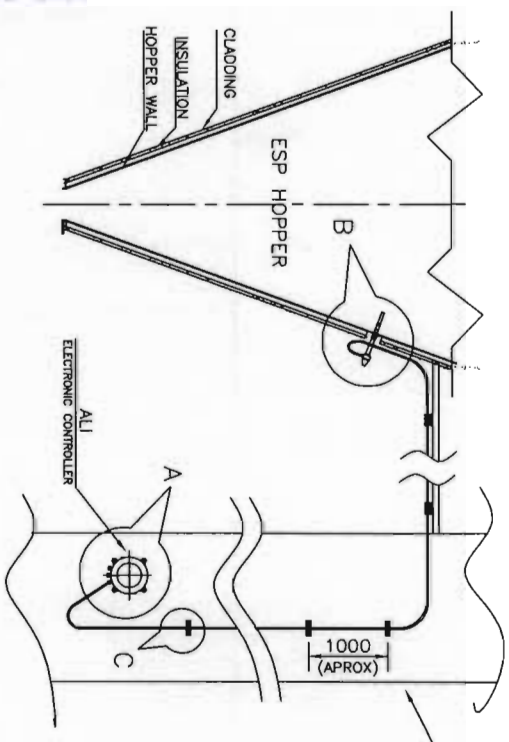
FIGURE 81



TYPICAL FIXING DETAIL OF HEATING ELEMENTS FOR HOPPER

FIGURE 82

ONLY FOR REFERENCE PURPOSES.



ELECTRONIC CONTROLLER

DETAIL "A"

SENSING PROBE

DETAIL "B"

EIP ENVIRO LEVEL CONTROLS PVT LTD
 NOIDA - INDIA

BHEL P.O.NG. : 4222884 DTD 08.01.2013
 PROJECT : NSPCL ROURKELA
 CUSTOMER : B H E L - RANIPET

TITLE - **TYPICAL INSTALLATION**
RF LEVEL SWITCH
 WITH SENSING PROBE (RIGID)
 MODEL: 550 (HIGH LEVEL)

APPROVALS:		DRG. NO.	REV.
DRN	CHD	BH-RSP-02	
SCALE - NTS	DATE	SH	1 OF 1

FOR REFERENCE PURPOSE ONLY

- NOTES:-**
1. ALL DIMENSIONS ARE IN MM ± 5%
 2. DEGREE OF PROTECTION FOR PROBE HEAD & ELECTRONIC CONTROLLER ENCLOSURE AS PER IP-66.
 3. SENSING PROBE TO BE MOUNTED PERPENDICULAR (90 ± 15) TO THE HOPPER WALL AND AT EQUAL DISTANCE FROM BOTH THE SIDE WALLS. ATLEAST 250 mm AWAY FROM OTHER INTERNAL GROUNDED PARTS
 4. SHIELD SECTION OF THE SENSING PROBE MUST PROJECT INSIDE THE HOPPER MORE THAN 40 MM
 5. CABLE DISTANCE FROM SENSING PROBE TO ELECTRONIC CONTROLLER 20 Mtr. MAX.
 6. UNSCREW THE "SOCKET" FROM THE PROBE. CUT A HOLE ON THE HOPPER PLATE AT THE DESIRED LOCATION OF THE SENSING PROBE. CUT-OUT SIZE-64 mm Ø INSERT THE SOCKET MORE THAN THE THICKNESS OF THE HOPPER PLATE, ENSURE THE AXIS 90 ± 15° TO THE HOPPER PLATE AND WELD ALL AROUND. INSERT PROBE AND THREAD.

IF ANY DOUBT ASK EIP ENVIRO

