



Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant,
Ranipet –632 406

Furbishing works of BHEL modules in IIT-M Research Park, Taramani, Chennai.

This tender document contains **167** pages



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Ranipet –632 406

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NOTICE INVITING TENDER

1. Tender Notice Number : BAP:CF:19/2009-10 dated 24.09.2009
2. Name of work : Furbishing works in IIT-M Research park in Chennai.
3. Completion Time : As per schedule A
4. Estimated Cost : Rs 52.00 Lakhs
5. Document cost : Rs. 500/-
6. Earnest Money Deposit : 1,50,000/-
7. Last Date & Time for receipt of Completed Tender. : Before 2.30 P.M. on 30.10.2009.
8. Date & Time of tender Opening:
 - Technical bid : At 2.30 P.M. on 30.10.2009.
9. Place of submission of Tender : Office of Sr. DGM (Civil-Factory)
BHEL, Ranipet Vellore Dist.
Tamil Nadu. Pin 632406.

This tender document contains 167 pages including the following.

Part I :- Technical Bid conditions from Page No.1 to 147 including General conditions of Contract, Special conditions of contract, drawings, Annexure A to G, Schedule A to D, etc

Part II :- Commercial Bid from Page No.148 to 167 of Bill of Quantities.

Tender should be submitted in a sealed cover consisting of two inner sealed covers such as i) Technical bid cover with requisite EMD & and all documentary evidence of meeting the qualifying requirements ii) Price bid cover (consisting of rate schedule only), super scribing the name of work, Tender Notice number , Due date of Opening.

Tenders without EMD shall be summarily rejected.

Note: The tenderer shall return the duly filled in tender document after affixing signature on all the pages of the Tender Documents.

Issued to :



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Annexure 'A'

Instructions to Tenderers

1. Eligibility criteria:

- i) Average annual financial turnover during the last 3 years ending 31st March 2009, should be at least 30% of the estimated cost of the scope of this bid.
- ii) Experience of having successfully completed similar works during the last 7 years as on 31.03.2009 for Government Departments, Government Undertakings **reputed private sectors** etc. should be any one of the followings:
 - a) Three similar completed works costing not less than the amount equal to **40%** of estimated cost.
 - b) Two similar completed works costing not less than the amount equal to **50%** of estimated cost.
 - c) One similar completed work costing not less than the amount equal to **80%** of estimated cost.

2. There are six sections of scope viz I to VI, tenderers are to quote for all the sections / parts without omitting any part unless otherwise specified in the tender. Omission of part of scope will lead to rejection of the offer. Section IV on furniture and workstations is free supply by BHEL from the range of M/s Godrej as per existing rate contract with the company. Tenderer has to submit an undertaking specifically certifying that he has no difficulties in coordinating & sequencing the installation of these along with other erection activities for the smooth execution of the works.

3. The tenderer who has experience and prequalification in one section & does not have the same in other sections of work and is interested in participating in this tender shall have consortium type of tie-up with another company and shall produce copies of proof of those companies fulfilling the prequalification as above for the respective portions of cost of their scope. Such copies are to be verifiable by BHEL's tender committee member (s) with the original if called upon to do so. Tenderers and consortium partners to give joint undertaking that they have no difficulties of working in coordination with themselves or with the IIT-M-Research Park's common architects, project engineers and contractors in various interphase issues for the smooth execution of the works in time to the full satisfaction of BHEL. In this connection, clause 15 hereunder is brought to the attention of the tenderers to visit and get to know the interphase areas and agencies to coordinate with.



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4. Sealed Tenders for the above said work is hereby invited from Contractors experienced in works of similar kind and magnitude.
5. Tenders should be addressed to Sr. DGM (Civil Factory), Bharat Heavy Electricals Limited, BAP, Ranipet 632 406, Vellore Dist. T.N. Fax 04172-241102 cell 9443389051 email ccdurai@bhelrpt.co.in The full name and address of the tenderer, name of the work, Tender Notice No. and the date of opening should be indicated on the cover.
6. The local address of the Contractor, the name of the person to whom all the correspondence are to be addressed should be indicated with telephone number (both office & residence), FAX / e-mail address, mobile no. etc..
7. All entries in the tender documents should be in same ink. Erasures and over writing are not permitted. All cancellations and insertions should be duly signed by the tenderer concerned with proper indication of the name, designation and address of the person signing.
8. Tenderers shall fill in all the required particulars in the blank spaces provided for this purpose in the tender documents and also sign each and every page of the tender document including the drawings (wherever applicable) attached there to before submitting the tender.
9. Unit rates should be quoted in figures as well as in words in **Indian Currency only** – i.e., Rupees and Paise with reference to each item and for all the items shown in the attached schedule. The rates shall include all taxes and duties payable **including Service Tax** and including expenses towards PF and ESI contributions Amount of each item and the total on each sheet as also the grand total amount of the whole contract shall be filled in by the tenderers.
10. In the case the rate quoted in figures differ from those quoted in words, the lower of the rates will be taken as the tendered rate and shall be binding on the tenderers.
11. In quoting their rates, the tenderers are advised to take into account all factors including any **fluctuations** in market rates. No claim for enhanced rates will be entertained on this account after acceptance of the tender or during the currency of the contract.
12. **The rates to be quoted shall be firm** and shall be inclusive of all applicable statutory levies arising from Central/State legislature and rules and regulations framed there under prevailing at the date 7 days prior to the last date of bid submission. Any variation in the existing statute or by introduction of new Tax and duties applicable to the above work will be to the account of BHEL at actuals against the documentary evidence.
13. (a) The rates quoted in the tender shall have the validity for a period of “THREE MONTHS” from the date of opening of tender.

(b) Tenderer shall not increase their quoted rates, once the tender has been opened and during execution of the contract in case his tender is accepted.
14. **Quantities shown in the attached schedule are only tentative and approximate** and are liable for variation. The quantity variation within +20% from the schedule will be



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paid at the quoted rates and the variation beyond +20% of the quantity will be paid deriving market rate at the discretion of BHEL.

15. Before quoting, the tenderers are advised to inspect the site of work and its environments and be well acquainted with the actual working and other prevailing conditions, position of materials and labour. They should be well versed with BHEL General Conditions of Contract, Instructions to tenderers, drawings wherever applicable and specifications and all other documents which form part of the agreement to be entered into subsequent to award of work. The tenderers shall specially note that it is the tenderer's responsibility to provide any item which is not specially mentioned in the specification or drawing, but which is necessary to complete the work.
16. Should a tenderer find discrepancies or omissions in the drawings wherever applicable / Specifications / Scope of work / Terms & Conditions attached to the tender documents or should be in doubt as to their meaning, he should at once address to the authority inviting the tender for clarifications.

Every endeavor is made to avoid any error which can materially affect the basis of the tender but the successful tenderer shall take upon himself to provide for the risk of any error which may be subsequently discovered and shall make no subsequent claim on account thereof.

17. In the event of tender being submitted by a firm, the tender must be signed separately and legibly by each partner or member of the firm or in their absence, by the person holding the power of Attorney on behalf of the firm concerned. In the latter case, a copy of the power of attorney duly attested by a Gazetted officer must accompany the tender.
18. Every tender must be accompanied by Demand Draft / deposit receipt for the amount mentioned as Earnest Money. This Earnest money will be refunded to the unsuccessful tenderers after finalization of the award of work. In the case of successful tenderer, the earnest money will be retained as part of the Security Deposit for satisfactory completion of the work.
19. **The Earnest Money Deposit shall be submitted along with Technical bid only and may be furnished in the form of Demand Draft drawn infavour of BHEL, RANIPET payable at Ranipet, Vellore Dist. T.N.**
20. Unless the Contractor whose tender is accepted signs the contract agreement within fifteen days (15 days) of the date of the order directing him to do so, the amount of Earnest Money already deposited by him may be forfeited and acceptance of his tender withdrawn.
21. If after opening of tenders, a tenderer revokes his tender or increases his earlier quoted rates or after acceptance of his tender does not commence the work in accordance with the instructions of Engineer-in-charge, the Earnest Money Deposited by him will be forfeited and acceptance of his tender withdrawn. If only a part of the work included in the tender had been awarded to the tenderer, the amount of Earnest Money to be forfeited will be based on the value of the contract so awarded.
22. BHARAT HEAVY ELECTRICALS LIMITED reserves the right to reject any or all the tenders received or accept any tender or part thereof without assigning any reason thereof. In the case of acceptance of a part of tender, the time for completion may also be reduced to the extent considered appropriate by the accepting authority.



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23. Conditional and unsigned tenders, **tenders containing absurd rates and amounts**, tenders which are incomplete or otherwise considered defective, tenders which are not in accordance with the tender conditions laid down by the Accepting Officer and tenders not submitted in the prescribed forms are liable to be rejected.

24. Documents to be submitted :

The contractors who are not on the approved list of contractors of this organization must submit the following testimonials simultaneously with their tenders. These testimonials shall be signed by the person (s) issuing the same indicating their name, designation and full address.

- i) List of similar works executed by the company since last six months.
- ii) List of movable/immovable assets.
- iii) Name of Banker and copy of latest audited Profit & Loss Accounts and Balance sheet.
- iv) PAN number.
- v) Name of your Banker, address and Account Number.
- vi) Sales Tax & Service Tax Registration Certificates.
- vii) PF & ESI Registration Certificate.

25. The tenders should be accompanied by a list of contracts already held by the Contractor at the time of submitting the tender and giving the following particulars:

- a) Name of work, value and address.
- b) The balance work remaining to be done on the same.

26. Tenders shall be received up to 14.30 Hours on the said due date and be opened on the same day at 14.30 Hours. Tenders received after 14.30 Hours would not be opened. The times indicated are Indian Standard Time (IST).

If a Tenderer submits only one envelope / cover containing all the bids or combined bids e.g. techno-commercial bid & price bid together, the bid is liable for rejection. The decision to accept such bids shall be the sole discretion of BHEL, which may be done by BHEL after segregating the bids so received.

27. The contractor's responsibility under this contract shall commence from the date of receipt of the order or acceptance of Letter of Indent.

28. If a tenderer expires after the submission of the tender or after the acceptance of the tender, BHEL may, at their discretion, cancel such tender.

29. If a partner of the firm expires after 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/s.

30. BHARAT HEAVY ELECTRICALS LIMITED will not be bound by any power of Attorney granted by the tenderer or by changes in the composition of the firm made subsequent



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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.

31. If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage. Further the tenderer will be liable for any damage caused.
32. Words imparting the singular number shall be deemed to include the plural number and vice-versa where the context so requires.
33. The General and Special Conditions of Contract are complementary to each other and where they are in conflict, the special condition shall prevail.
34. The expenses for completing the stamping of the agreement shall be paid by the contractor.
35. Any covering letter and comments of the Contractor should be submitted in duplicate along with the offer.
36. Should a tenderer or a contractor on the list of approved contractors have a relative or in the case of firm or Company of contractors any of its share holder's relative is employed in a Gazetted Capacity in the Boiler Auxiliaries Plant, Bharat Heavy Electricals Limited, Ranipet 632 406, the authority inviting tenders shall be informed of this fact at the time of submission of the tender, failing which tender may be disqualified or if such a fact subsequently come to light, the relevant provisions of the General Conditions of Contract will apply.
37. These 'INSTRUCTIONS TO TENDERER'S & 'GENERAL CONDITIONS OF CONTRACT OF BHEL' shall be deemed to form an integral part of the contract agreement for the work to be entered into. In cases of variation between the two in any matter, the conditions in the 'THE INSTRUCTIONS TO TENDERERS' shall prevail. Extracts of some of the important clauses of BHEL G.C.C are enclosed (Annexure containing extracts of clauses 22, 40 & 60 of BHEL GCC). The contractor has to obtain, at his cost, a copy of the BHEL GCC, scrutinize the same, and when submitting his tender, indicate his acceptance of BHEL GCC in the proforma enclosed at **Annexure B**.
38. The Contractor shall comply with the provision of Employees Provident Fund and Miscellaneous Provisions Act 1952 and rules, regulations and other orders issued there under. He, as an employer, shall be liable to pay employer's contribution/deductions towards PF under the PF Act in respect of all labour employed by him, for the execution of the contract in accordance with the provisions of the Employees Provident Funds and Miscellaneous Provisions Act, 1952 as amended from time to time. For this purpose he shall indicate the code number obtained from the Regional Provident Fund Commissioner or he should obtain a code number if he has not and produce the Photostat copy of the challan / receipt of monthly remittance of the contribution made by him to the PF Commissioner.
39. The Contractor should get himself registered with the E.S.I. Authorities as an independent Employer, obtain a separate code number and remit the dues in respect of the labour employed by him for the work and produce the Challans / Receipts of remittance of the ESI contributions due under the E.S.I. Act to the Company authorities. He shall also furnish such returns, as are due, under the Act, to be sent to the appropriate authorities through the Principal Employer.



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40.1 If any action is brought in by P.F. Commissioner/ESI authorities on BHEL for the work done by the Contractor for his labourers regarding PF/ESI amount due, short remittances, non remittances etc., the Contractor shall defend the case on behalf of BHEL and/or reimburse BHEL the expenses so incurred.

40.2 If applicable, the Contractor shall apply and obtain license under Contract labour (R&A) Act 1970 and comply with the relevant provisions of this Act in respect of the labour employed by him for executing this contract. The Contractor shall furnish necessary returns to the authorities through the Principal Employer.

40.3 If applicable, the Contractor shall insure all his labourers and materials. Any claim by his employees for the damages shall be settled by the contractor even action is against BHEL or to reimburse the legal expenses incurred by BHEL.

40. Contractor shall produce necessary records, documents, explanation whenever he is called upon to do, by any Government Agencies like ESI, PF, VIGILANCE etc..

41. TERMS OF PAYMENT:

The Terms of payment will be as per the Terms & Conditions enclosed.

42. EXTRA ITEMS / **DEVIATED ITEMS**:

No extra items of work shall be carried out by the contractor other than those authorized to do so in writing by the Engineer. For any such items of work executed as per instructions of Engineer, the rates will be fixed on the basis indicated under clause 52 of BHEL GCC.

43. SECURITY DEPOSIT:

a) The rate of Security Deposit (SD) will be as below:

- Up to Rs. 10 lakhs: 10%
- Above 10 lakhs up to 50 lakhs: Rs. 1.lakh + 7.5% of amount exceeding Rs. 10 lakhs.
- Above 50 lakhs: Rs. 4 lakhs + 5% of the amount exceeding Rs. 50 lakhs.

The Security Deposit should be collected before start of the work from the Contractor.

b) The security deposit may be furnished in any one of the following forms:

- 1) Cash (as permissible under the Income Tax Act)
- 2) Pay order, Demand draft in favour of BHEL,
- 3) Local cheques of scheduled banks, subject to realization.
- 4) Securities available from Post offices such as National Savings 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).
- 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.



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- 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, A/c BHEL, duly discharged on the back.
- 7) Security Deposit can also be recovered at the rate of 10% from running bills. However in such cases at least 50% of the Security Deposit should be collected before start of the work and the balance 50% may be recovered from the running bills.
- 8) EMD of the successful tenderer can be converted and adjusted against the security deposit.
- 9) The security deposit shall not carry any interest.

(Note: Acceptance of security deposit against Serial No.4 & 6 above will be subject to hypothecation or endorsement on the documents infavour 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.)

For extra items of work and deviated quantities, security deposit will be recovered at 10% of the value of deviated amount. The security deposit will be released as stipulated under clause 16 (IV) of GCC.

Percentage rate contract:

The tenderer shall quote a percentage above or below or at par, the rates shown in the Bill of Quantities based on CPWD DSR 2007. The percentage quoted shall be clearly written both in works and figures.

The quoted percentage will apply to the individual items uniformly and the item of work other than those mentioned in Bill of Quantities will have to be carried out at the rates to be fixed by the organization. The same offered percentage will be applicable with reference to CPWD DSR 2007.

The contractor has to make his own arrangement for water and power for furbishment work.



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ANNEXURE: B

Acceptance of General Conditions of Contract of BHEL

It is hereby agreed by me/us that the BHEL General Conditions of Contract including subsequent amendments/additions/deletions to clauses if any, and conditions pertaining to the settlement of disputes by Arbitration form an integral part of the tender documents and that the tender submitted by me/us is subject to the aforesaid BHEL General Conditions of Contract which has been read and accepted by me/us.



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ANNEXURE 'C'

CLAUSE 22 OF GENERAL CONDITIONS OF CONTRACT

LABOUR

The contractor shall employ labour in sufficient numbers either directly or through sub-contractors to maintain the required date of progress and of quality to ensure workmanship to the degree specified in the contract and to the satisfaction of the Engineer – in – charge. The contractor shall not employ, in connection with the works, any person who has not completed eighteen years of age.

The Contractor shall pay to labour employed by him, either directly or through sub-contractors, wages not less than fair wages, as defined in the Contractor's Labour Regulations.

The Contractor shall in respect of labour employed by him, either directly or through sub-contractors, comply with or cause to be complied with contractor's labour Regulations in regard to all matters provided therein.

The Contractor shall comply with the provisions of the payment of Wages Act, 1936, Minimum Wages Act, 1948, Workmen's Compensation Act 1923, Industrial Disputes Act, 1947, Maternity Benefit Act 1961, or any modifications thereof or any other law relating there to and rules made there under from time to time.

The Contractor shall be liable to pay his contribution and the employee's contribution of the State Insurance Scheme in respect of all labour employed by him for the execution of the contract, in accordance with the provision of "The Employees' State Insurance Act, 1948" as amended from time to time. The Contractor shall apply to the ESI Authorities, get himself registered with them and obtain a code Number. He shall pay the remittances under his Code Number only.

The Contractor shall be liable to his contribution and the employees contribution towards PF as per Provident Fund Rules and Regulations, in respect of all labour employed by him for the execution of the contract. The Contractor shall apply to the PF Authorities, get himself registered and obtain a code number from them. He shall pay the remittances towards PF under his code number only.

The Engineer-in-charge shall, on a report having been made by an Inspecting Officer as defined in the Contractor's Labour Regulations, have the power to deduct from the moneys due to the contractor any sum required or estimated to be required, for making good the loss suffered by a worker or workers by reason of non fulfillment of the conditions of the contract for the benefit of workers, non-payment of wages or of deductions made a from his or their wages which are not justified by the terms of the Contract of non observance of the said Contractor's Labour Regulations.

The Contractor shall indemnify BHEL against any payment to be made under and for observance of the Regulations aforesaid without prejudice to his right to claim indemnity from his sub-contractors.

In the event of the Contractor committing a default or breach of any of the provisions of the aforesaid contractor's Labour Regulations, as amended from time to time or furnishing any information or submitting or filling any form/Register/Slip under the provisions of these Regulations which is materially incorrect, then, on the report of the Inspecting Officers as defined in the Contractors Labour Regulations, the Contractor shall without prejudice to any other liability



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pay to BHEL a sum not exceeding Rs. 50/- as liquidated damages for every default, breach, or furnishing, making, submitting, filling materially incorrect statements as may be fixed by the Engineer-in-charge and in the event of the contractor's default continuing in this respect, the liquidated damages may be enhanced to Rs. 50/- per day for each day of default subject to a maximum percent of the estimated cost of works put to tender. The Contractor shall defend the case by himself any action brought in by such Government Agencies for non-compliance of any Labour Regulations and / or reimburse the expenses incurred by BHEL in this regard.

The Engineer-in-charge shall deduct such amount from bills or security deposit of the Contractor and credit the same to the welfare fund constituted under Regulations. The decisions of the Engineer-in-charge in this respect shall be final and binding.

MODEL RULES FOR LABOUR WELFARE

The Contractor shall, at his own expense, comply with or cause to be complied with Model Rules for Labour Welfare as appended to these conditions or rules framed by Government from time to time, for the protection of health and for making sanitary arrangements for workers employed directly or indirectly on the works. In case the Contractor fails to make arrangements as aforesaid, the Engineer-in-charge shall be entitled to do so and recover the cost there from the contractor.

SAFETY CODE

RESPONSIBILITIES OF THE CONTRACTOR IN RESPECT OF SAFETY OF MEN, EQUIPMENT, MATERIAL AND ENVIRONMENT

1. Before commencing the work, the contractor is required to submit a "SAFETY PLAN" to the authorized BHEL official. The 'safety plan' shall indicate, in detail, the measure that would be taken by the contractor to ensure safety of men, equipment, material and environment during execution of work. The plan shall take care to satisfy all requirements specified hereunder. The contractor shall submit safety plan along with his offer. During negotiations before placing of work order and during execution of the contract, BHEL shall have right to review and suggest modification in the safety plan. The contractor shall abide by BHEL's decision in this respect.
2. The contractor shall take all necessary safety precautions and arrange for appropriate appliances as per direction of BHEL, or its authorized officials, to prevent loss to human lives, injuries to personnel engaged, and damage to property and environment.
3. The contractor shall provide to its work force and ensure the use of the following personal protective equipment as found necessary and as directed by the authorized BHEL officials:-
 - (i) Safety helmets conforming to IS-2925: 1984.
 - (ii) Safety Belts conforming to IS-3521:1983
 - (iii) Safety Shoes conforming to IS-1989:1978.
 - (iv) Eye and Face protection devices conforming to IS-8520:1977. and IS-8940:1978.
 - (v) Hand and body protection devices conforming to
 - (1) IS-2573:1975 (2) IS-6994:1973 (3) IS-8807:1978 (4) IS-8519:1977.



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All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, safety nets, ladders, equipment etc. used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained, before putting them to use and from time to time as instructed by authorized BHEL official who shall have the right to ban the use of any item.

All the electrical equipment, connections and wiring for constructions, power, its Distribution and use shall conform to the requirement of Indian Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carry out the all types of electrical works. All electrical appliances including portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed.

The contractor shall not use any hand – lamp energized by electric power with supply voltage of more than 24 Volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 Volts.

The contractor shall adopt all fire safety measures as laid down in the “Code for Fire Safety at Construction sites” issued by the safety department of BHEL and as per the directions of the authorized BHEL official. A copy of the above referred “Code for Fire Safety at Construction sites” shall be made available by BHEL to the contractor for reference, on demand by the contractor, during tendering stage itself.

Where it becomes necessary to provide and/or store Petroleum Products, explosives, chemicals and liquid or gaseous fuel or any other substance that may cause fire or explosion, the contractor shall be responsible for carrying out such provisions and / or storage in accordance with the rules and regulations laid down in the relevant government acts, such as Petroleum Act, Petroleum and Carbides of Calcium Manual of the Chief Controller of Explosives, Govt. of India etc., Prior approval of the authorized BHEL official at the site shall also be taken by the contractor in all such matters.

The contractor shall arrange at his cost (wherever not specified), appropriate illumination at all work spots for safe working when natural daylight may not be adequate for clear visibility.

The contractor shall be held responsible for any violation of statutory regulations local, state or central and BHEL instructions, that may endanger safety of men, equipment, material and environment in his scope of work or another contractor's or agency's. cost of damages if any, to life and property arising out of such violation of statutory regulations and BHEL instructions, shall be borne by the contractor.

In case of fatal or disabling injury/accident to any person at construction sites due to lapses by the contractor, the victim and/or his/her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the contractor for suitably compensating the victim and/or his/her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.

In case of any damage to property due to lapses by the contractor, BHEL shall have the right to recover cost of such damages from payments due to the contractor after holding an appropriate enquiry.

In case of any delay in the completion of a job due to mishaps attributable to lapses by the contractor, BHEL shall have the right to recover cost of such delay from payments due to the contractor, after notifying the contractor suitably and giving him opportunity to present his case.



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If the contractor fails to improve the standards of safety in its operation, to the satisfaction of BHEL, after being given a reasonable opportunity to do so and / or / if the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorized BHEL official, BHEL shall have the right to take corrective steps at the risk and cost of the contractor, after giving a notice of not less than seven days, indicating the steps that would be taken by BHEL.

The contractor shall submit report of all accidents, fires and property damage, dangerous occurrence to the authorized BHEL official immediately after such occurrence, but in any case not later than twelve hours of the occurrence. Such reports shall be furnished in the manner prescribed by the contractor to the authorized BHEL official from time to time as prescribed.

Before commencing the work, the contractor shall appoint/nominate a responsible office to supervise implementation of all safety measures and liaison with his counterpart of BHEL.

If the Safety record of the contractor is to the satisfaction of Safety Department of BHEL, issue of an appropriate certificate to recognize the safety performance of the contractor may be considered by BHEL after completion of the job.



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ANNEXURE:'D'

Terms & Conditions

01. The contract is for a period of 1½ months.

02. The offer shall be submitted in two parts

- a) Technical and Commercial Bid
- b) Price Bid

The technical bid shall cover all the technical details like

- (i) The Experience of the contractor i.e., the eligibility criteria of the tenderer shall be as specified in the tender notice.
- (ii) The list of technical personnel in their organization with their qualification & experience in the field.
- (iii) The infrastructure available with them
- (iv) The certificates received from the Government/reputed organizations for having taken up similar work of equivalent value.
- (v) The list of clients with their addresses, contact persons.
- (vi) The list of works being done at present with the details of Contact persons and addresses.
- (vii) The EMD in the form of DD shall be drawn in favour of "Bharat Heavy Electricals Limited, Ranipet 632 406 payable at Ranipet, Vellore Dist. T.N.
- (viii) EMD shall be enclosed along with Technical Bid only.
- (ix) The details of the tenderer's office with full address, Phone No. FAX No., Mobile No. shall be specified on the Tender document cover. If the tenderer gives wrong information, then the EMD submitted by the tenderer will be forfeited.

Prices shall be quoted in the price schedule as per Part II in the last two columns of the BoQ.

The contractor shall comply with all statutory regulations like ESI, PF Contract Labour License (if applicable), Minimum Wages Act etc.,

03. The rate quoted shall include the wages payable to the employees, Statutory charges like ESI, PF, Bonus, Holiday & EL wages, safety appliances etc., While quoting the rate, the contractor shall take into account, the implication of probable revision in the minimum wages also.



Bharat Heavy Electricals Limited
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04. The contractor shall issue necessary safety appliances like Safety Shoes, Gum Boots, Acid & Alkali Proof Hand Gloves, Masks etc., to their workers for safe operation.
05. The contractor shall maintain all the records w.r.t. ESI, PF, Wages & Attendance.
06. The tenderer shall fill up the questionnaire as per Part I **Annexures** and enclose along with Technical bid.
07. The minimum wages from 01.04.2009 will be as follows:

USW -149.00

SSW -156.00

HSW -162.00

Please note that the minimum wages are normally revised by the authorities from every year April month.

If any employee / labourer working in the contract is found involved in corruption activities, the contract will be terminated and the contractor will be banned for applying for any future contract for 3 years.

08. Normally, no advance payment shall be paid to the contractor.
09. However, advance payment in exceptional circumstances, if specifically provided shall be interest bearing and secured through an equivalent bank guarantee and shall be limited to a maximum of 5% of the contract value.

Recovery of advances will be made from the running bills progressively such that the amount paid along with the interest is fully recovered by the time the contractor reaches 90% billing of total value of works to be executed. (Interest rate shall be the prime lending rate of SBI plus 2%).

10. During the progress of the work progressive payment will be made to the contractor on production of invoice with necessary statutory clearance and the bill will be processed within 15 days from the date of submission all the relevant documents.
11. All Payments will be made only through e-Mode, necessary authorization as to be submitted along with the tender as per the format enclosed.



Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant,
Ranipet –632 406

ANNEXURE - E

Questionnaire should be answered by the tenderer by “yes / no “ the suitable boxes. Non filling up and signing liable for rejection at the discretion of the BHEL

Sl.No.	Description	Reference	Yes	No
01	Whether the tenderer has understood the scope of work and agrees to deploy manpower as indicated in the tender. (If there is any clarification required, the same may be got cleared from the Executive-in-charge, before submitting the offer.)	12 of Instructions to tenderers & Annexure-A & C		
02	Whether the tenderer has agreed to all Terms & Conditions given in the tender. (If there is any deviation, the same may be mentioned in separate sheet.)	(Annexure D)		
03	Whether the tenderer has their own code for ESI & PF. A copy of the certificate enclosed	36 of Instructions to tenderers		
04	Whether the tenderer has enclosed copy of the present Service/Sales/Works contract sales Tax registration certificates. If a vendor is exempted from the registration under Service/Sales Tax, the reason there of be stated.	21(i) of Instructions to tenderers		
05	Whether the vendor/Contractor is availing service Tax credit/VAT Credit for their inputs.			
06	Whether the vendor will submit VAT/Service Tax invoice as per the existing ACT and the rules their under.			
07	Whether the tenderer agrees to Pay Wages as per Minimum wages Act, EL Wages, Holiday Wages as per Tamilnadu Factory rules. (Necessary proof should be submitted while claiming running bill and final bill.)	(Annexure D)		
08	Whether the PAN Number of the vendor is furnished. If exempted from IT, the exemption certificate shall be enclosed.	21(iv) of Instructions to tenderers		
09	Whether the tenderer agrees to keep the validity of their offer for three months from the date of opening of bid.	10 (a) of Instructions to tenderers		
10	Whether the tenderer agrees for the payment terms BHEL..	Clause 56 of GCC		
11	Whether the tenderer has agreed to submit EMD of Rs.1,50,000/- and has submitted the same along with technical bid. (If not enclosed the tender will not be considered.)	Page 1 of Instructions to tenderers		
12	Whether the tenderer has agreed to submit Security Deposit before start of the work	40 of Instructions to tenderers		
13	Whether the tenderer has enclosed the list of their clients with addresses & contact persons.	21(i) of Instructions to tender		
14	Whether the tenderer has enclosed the certificates/evidence of Government/Reputed organization for the similar work done			



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15	Whether the tenderer has enclosed the list of similar works Carried out with supporting documents	21(i) of Instructions to tenderers		
16	Whether the includibility/excludability of the taxes and duties in the rates offered has been clearly indicated. If the same is not done, BHEL WILL CHOOSE TO ASSUME THE RATES ARE INCLUSIVE ONLY.			
17	All payments will be made through e-payment only for which required certificate to be submitted along with tender as per the enclosed format.	(Annexure D)		
18	Whether the tenderer has enclosed the list of technical personnel , their qualification & experience who will be deployed for this work.			
19	Whether the tenderer has indicated the address of their local office in Ranipet along with phone no. & fax no.			
20	Whether the tenderer has enclosed the solvency certificate obtained from a bank for a value of Rs.----- ----- minimum.			
21	Whether the tenderer has enclosed the certificate to establish that the tenderer is an independent contractor working on his own.			
22	Whether the tenderer agreed for the period of completion mentioned in schedule A			
23	Whether the tenderer agreed for the advance as specified in the terms & conditions given in Annexure F	Sl. No. 09		
24	Whether the tenderer agreed for the compensation for delay as specified in clause 43 of General Conditions of Contract.	Clause 43 of GCC		

Note: If any of the question is not applicable, please mention as “N. A.”



Bharat Heavy Electricals Limited
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Ranipet –632 406

Annexure 'F'

AUTHORITY TO TENDER

1. Tender Notice No. : BAP:CF:19/2009-10 dated 24.09.2009

Office of the Sr. Deputy General Manager,
Bharat Heavy Electricals Limited, Ranipet

Tender Schedule No. :

Percentage rate tender for works required in BHEL – Ranipet. Messers / Mr.of..... are / is hereby authorized to tender for the above work. The tender is to be delivered at the Office of the Sr.Dy.General Manager / Civil Factory by 14.30 hours on 19.10.2009 addressed to the Office of the Sr.Dy.General Manager (Civil Factory) Bharat Heavy Electricity, Ranipet – 632 406 subscribed "tender" for the work of Furbishing works for BHEL modules in IIT-M Research park in Chennai.

Any correspondence concerning this Tender should be addressed as indicated above quoting the Tender Notice and Schedule Nos. and other relevant particulars.

Bharat Heavy Electricals Limited do not Bind Themselves to Accept the Lowest or any tender. Further Bharat Heavy Electricals Limited reserve the right to reject any or all the Tender Received or Accept any Tender or Part Thereof without Assigning any Reason therefor.

Signature of the Officer,

Issuing the documents



Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant,
Ranipet –632 406

Annexure 'G'

TENDER

To.

The Bharat Heavy Electricals Limited,
Boiler Auxiliaries Plant,
Ranipet 632 406.

I/We hereby offer to carry out the work of [Furbishing works for BHEL modules in IIT-M Research park in Chennai.](#)

I/We have carefully perused the following documents connected with the above noted work and agree to abide by the same.

1. Specifications (General & particular)
2. Drawings.
3. Schedule 'A','B','C','D','E' and Bill of Quantities attached hereto.
4. BHEL General & Special conditions of contract. Tender Notice, Annexures and Instruction to Tenderers attached hereto,.

I/We forward herewith the sum of Rs. 1,50,000/- as Earnest Money which shall be refunded if this tender is unsuccessful. I/We further agree to deposit such sum which along with the sum of Rs. 1,50,000/- mentioned above shall make up the full Security Deposit for this work as provided for under condition 18 of the Bharat Heavy Electricals Limited, General Conditions of Contract.

I/We further agree to execute all the work referred to in the said documents upon the terms and conditions contained or referred to therein and as detailed in schedule 'A' and Bill of Quantities annexed thereto and to carry out such deviations as may be ordered vide condition 6 of the BHEL General Conditions of Contract up to a maximum of 20% of tendered amount.

I/We further agree to refer all disputes, as required by condition 60 of the said General Conditions of Contract, to the Sole Arbitration of an Officer, to be appointed by the General Manager, BHEL, in his sole discretion, whose decision shall be final and binding on both the parties.

Witness:

Signature of the Tenderer,

1.

Date:

2.

Accepting officer



Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant,
Ranipet –632 406

Annexure 'H'

Check list of information submitted along with Tender

S.No.	PARTICULARS	YES	NO
01	SERVICE TAX		
a.	Service Tax Registration No. of Tenderer (copy to be enclosed)		
b.	Issue of Service Tax Invoice as per Rule 9 of Cenvat Credit rules 2004		
c.	Whether Tenderer 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 Tenderer		
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 Tenderer is availing VAT Credit		
d.	If Exempted , furnish Reasons		
	NOTE :		
	1. Rates Quoted shall be clearly indicated whether they are INCLUSIVE or EXCLUSIVE of specific Taxes & Duties. Otherwise generally it is presumed that the rate are inclusive and the Contractor has to issue invoice accordingly.		
	2. Payment will be made only through e-payment to your account. No Cheque payment is entertained.		
04.		Tenderer	BHEL
a.	Name & Address		BHEL, BAP, Ranipet-406
05.	Details of Bank Account :		
a.	Centre		RANIPET
b.	Name of the Bank		S.B.I
c.	Branch Code & Name		7013, Mukundarayapuram
d.	Account Number		10664849171
e.	Type of Account		Cashcredit
f.	Beneficiary's Name		BHEL , Ranipet
g.	IFSC Code of the Branch		SBIN0007013
Tenderer has to submit Banker's Certificate as per the following format specified by BHEL along with the tender.			
Agreed to the Above Conditions			
Signature of the Tenderer :			



Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant,
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Annexure 'I'

ACCEPTANCE FOR ELECTRONIC FUND TRANSFER / RTGS TRANSFER

01	NAME & ADDRESS OF THE SUPPLIER / VENDOR	
02	VENDOR CODE (as in Purchase Order)	
03	Details of Bank Account:	
A)	NAME & ADDRESS OF THE BANK (WITH PIN CODE)	
B)	BANK TELEPHONE NUMBER (WITH STD CODE)	
C)	BANK BRANCH CODE	
D)	MICR CODE	<input type="text"/>
E)		<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)	YOUR EMAIL ID (give two ids)	
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)



Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant,
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SCHEDULE – A LIST OF WORKS AND PRICES

Details and quantities of each item shown in the bill of quantities here are only approximate. They are given as a guide for the purpose of tendering only and are liable to variation and alteration at the discretion of the competent authority. The work under each item as executed shall be measured and priced at the corresponding rate quoted by the contractor in the bill of quantities attached hereto.

Sl.No.	Description of work/supply	Total Value of work/supply in Rs.(in figures and words)	Period of Completion
1	Furbishing works for BHEL's modules in IIT-M Research park, Taramani, Chennai.	Sections I to VI separately	1½ months.

Section IV requires no supply but only installation of free supply of M/s Godrej items by BHEL. The tenderer has to give an under taking that he is willing to coordinate the sequence of activities for smooth execution of the entire works to the full satisfaction of BHEL.



Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant,
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BILL OF QUANTITIES
ANNEXURE TO SCHEDULE – A

NAME OF WORK: Furbishing works for BHEL's modules in IIT-M Research park, Taramani, Chennai.

SL.NO.	APPROXIMATE QUANTITY	DESCRIPTION OF WORK/SUPPLY	SPECIFICATION	RATE in Rs. (both in figures and words)	UNIT	AMOUNT
--------	----------------------	----------------------------	---------------	---	------	--------

As per separate sheets attached



SCHEDULE – B
ISSUE OF STORES TO THE CONTRACTOR

1. The following materials will be issued to the contractor at BHEL stores/stock yard.

SL.NO.	DESCRIPTION	PLACE OF	ISSUE RATE
1	Cement	BHEL Stores or Stock Yard	No issue
2	MS Reinforcement rods cold twisted deformed rods	BHEL Stores or Stock Yard	No issue
3	Structural Steel	BHEL stores or stock yard	No issue

2. It will be the responsibility of the contractor to submit his indents for the above stores in writing at least SEVEN days in advance of the actual requirements

3. Issue of stores is subject to their availability at the place of issue noted above. Items of stores to be issued by BHEL, which are not available at the time of indenting by the contractor, may be supplied by BHEL after necessary procurement. The contractor shall not be entitled to any claim or compensation for delay in the supply of stores by BHEL under any circumstances.

4. The material will be issued only during the working hours of the BHEL stores department.

5. The contractor shall from time to time, render proper account of all materials issued to him by BHEL. If he fails to do, no further issue of materials will be made to him and he will responsible for any delay in the execution of the work, which may occur on this account.

6. All surplus materials in good condition, which are not returned to the BHEL Stores and quantities of materials consumed in excess of max. permissible limit as fixed by BHEL shall be charged for at punitive rates, which will be 100% higher than the recovery rates.

7. The steel materials if issued will be in random lengths and sizes as stocked by the BHEL and the cost of all cutting, conversion, substitution and fabrication as well as wastage shall have to be borne by the contractor.

8. The Structural and reinforcement steel will be issued at free of cost at BHEL stores, Recovery for the excess consumption up to 5% over and above theoretical consumption will be recovered as stated in the special condition. Beyond 5% punitive rate shall be charged, which will be 100% higher than the recovery rate specified above.

9. The decision of the accepting officer/Engineer-in-charge as the case may be as to the extent to which materials have been rendered surplus or consumed in excess of the actual requirements shall be final, conclusive and binding on the contractor.



Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant,
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SCHEDULE – C
LIST OF TOOLS AND PLANTS TO BE ISSUED ON HIRE TO CONTRACTOR

SL.NO.	QUANTITY	PARTICULARS	HIRE CHARGES PER UNIT PER DAY OF 8 HOURS	PLACE OF ISSUE	REMARKS
--------	----------	-------------	--	----------------	---------

-NIL -

- Machinery shall not be worked overtime without the written permission of the Engineer-in-charge and cost of liability of the same will be contractor's.
- All coolies, waterman, etc., required in addition to BHEL crew mentioned in Column 4 above shall be arranged for by the contractor at his own expense.



Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant,
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SCHEDULE – D

NAME OF WORK: Furbishing works for BHEL's modules in IIT-M Research park,
Taramani, Chennai.

SL.NO.	DRAWING NUMBER	DESCRIPTION
01 floor	BHEL-IIT-MRP:005 Rev. 15	Furbishment of modules D3 & D4 on 9 th "BHEL @IIT-M Research park"

NOTE: All drawings are to be signed by the contractor as well as the officer entering in to contract.

**GENERAL CONDITIONS OF CONTRACT
FOR
LUMP SUM, ITEM RATE AND
PERCENTAGE CONTRACT**



Bharat Heavy Electiicals Limited
BOILER AUXILIARILS PLANT
RANIPET

GENERAL CONDITIONS OF CONTRACT
FOR
LUMP SUM, ITEM RATE AND
PERCENTAGE CONTRACT



Bharat Heavy Electricals Limited

BOILER AUXILIARIES PLANT
RANIPET - 632 406.

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CHAPTER -1

DEFINITIONS IN THE CONTRACT AS HERE IN AFTER DEFINED

The following terms shall have the meanings hereby assigned to them, except here the context otherwise requires:-

- a. **'CONTRACT'** means and includes the conditions of contract, the documents forming the tender and acceptance thereof, specifications, drawings, bill of quantities, schedule of rates and prices if any, general and special conditions of contract, **MOMs drawn**, schedules A,B,C,D and or general summary attached to the form of tender and contract agreements. All these terms and conditions and documents as applicable taken together shall be deemed to form one contract and thereby complementary to one another.
- b. **'TENDER DOCUMENTS'** means and includes the form of tender, the applicable schedules A, B, C, D and / or general summary, general and special conditions of contract and specifications and drawings as given to the contractors on payment.
- c. **'THE CONTRACTOR'** means the person or persons, firm or company whether incorporated or not, whose tender is being accepted and includes the contractor's Legal / personal representatives, successors and permitted assignees.
- d. **'THE WORK'** means the work described in the tender documents and / or individual work orders, drawings and specifications as may be issued from time to time to the contractor by the Engineer - in - Charge within the powers conferred upon them including modified or additional works and obligations to be carried out either at the site or at any factory, workshop or any other place as required for the performance of the contract.
- e. **'THE SITE'** means the lands and other places on, under, in or through which the work has to be executed under the contract and any other lands and places provided by the company for the purpose of carrying out the contract.
- f. **'THE COMPANY'** referred to as BHEL in this contract shall mean M/s. Bharat Heavy Electricals Limited including its Board of Directors, Director, Executive Director, Group General Manager, General manager, Dy. General Manager and / or the Officers of the company Including Sr. Manager, Manager, Dy. Manager, Sr. Engineer and Engineer authorized on behalf of Bharat Heavy Electricals Limited, Boiler Auxiliaries Plant, Ranipet.
- g. **'THE ACCEPTING OFFICER'** means the official who signs the contract agreement on behalf of Bharat Heavy Electricals Limited and includes his successors.
- h. **'ENGINEER- I N - CHA RGE'** means the Officer / Engineer of BHEL who is in-charge of works under the contract and includes such other Officer / Engineer as may be notified by BHEL from time to time.
- i. **'APPROVED AND DIRECTED'** means approval and / or directions of the Officers / Engineers of BHEL issued from time to time with regard to the contract.

- j. In the case of Lump-sum Contracts 'CONTRACTOR's PERCENTAGE' means the percentage offered by the Contractor as addition / deduction from the cost of building, or other works listed in Schedule "A" to provide a Lump-sum quotation for performance of the contract inclusive of all extra costs, profit, establishment charges, carriage, insurance etc., complete.

In the case of Percentage rate contracts "Contractor's Percentage" shall, if the context so permits mean the uniform percentage tendered by the Contractor and accepted by the Accepting Officer, and the expression '**CONTRACT RATE**' shall likewise mean the rates in the BHEL Schedule of Rate applicable as on date as adjusted by the said Contractor's percentage, if any.

- k. '**THE CONTRACT SUM**' means the sum accepted or the sum calculated in accordance with the prices accepted in the tender and / or the contract rates as payable to the contractor for the execution and full completion of the work **to the satisfaction of the Company.**
- l. The '**FINAL SUM**' means the actual amount payable under the Contract by BHEL, to the Contractor for the entire Execution and full completion of the work **to the satisfaction of the Company.**
- m. The "**DATE OF COMPLETION**" is the date or dates for completion of the whole or any part of the work as the case may be set out in or ascertained in accordance with the individual work orders of the tender documents, or any subsequent agreed amendments thereto.
- n. A '**WEEK**' means seven days without (regard to the number of hours worked or not in any day in that week.
- o. A '**DAY**' means a day of 24 (Twenty Four) hours irrespective of the number of hours worked or not in that day.
- p. A '**WORKING DAY*** means any day other than the holidays declared by BHEL, Ranipet.
- q. '**DEVIATION ORDER**' means an order given by the Engineer- in-Charge to effect an alteration, addition or deduction which does not radically affect the scope or nature of the contract.
- r. '**EMERGENCY WORKS**' means any urgent measures which in the opinion of the Engineer-in-Charge, become necessary during the progress of the work to obviate any risk of accident or failure which become necessary for security,
- s. '**PROVISIONAL SUM**' or "Provisional Lump-sum" means a Lump-sum included by the BHEL in the tender documents and represents the estimated value of work for which details are not available at the time of inviting the tender.
1. '**PROVISIONAL ITEMS**' means items for which approximate quantities have been included in the tender documents.
- u. '**DAY WORK**' means an item of work requiring the employment of labour with, or without materials as the case may be which in the opinion of the Engineer-in-charge, is not capable of being evaluated by the accepted methods of measurement or assessment and is paid for on the basis of the actual labour and materials utilized on the particular item of work referred to.

- v. Heading of these terms and conditions shall not affect the interpretation or construction thereof,
- w. The '**DATE OF CONTRACT**' shall mean the date /dates on which the parties to the contract have signed the contract agreement.
- x. **MAINTENANCE PERIOD / GUARANTEE PERIOD** shall mean the period during which the contractor shall remain liable for satisfactory performance of the work under the contract, repair or replacement of any part of the work performed under the contract.
- y. '**COST**' shall mean and include any liability, expenditure, overhead costs whether on the site or off the site incurred by BHEL.

The contractor shall be deemed to have carefully examined all the documents to his satisfaction. If he shall have no doubt as to the manner of the contract document, he shall obtain the details / clarification from **the Company** before signing the contract.

MANNER OF EXECUTION OF CONTRACT

The contract shall be deemed to have come into force from the date of Letter of Intent unless otherwise provided in the Letter of Intent. Unless and until the contract agreement is executed, the Letter of Intent read in conjunction with the tender documents will constitute a binding contract.

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CHAPTER - II

SCOPE OF CONTRACT

2. Heading to the Contract

The heading to these conditions shall not affect the interpretation thereof.

3. Contract Documents:

The Accepting Officer shall furnish to the Contractor on demand "FREE OF COST" three copies of signed Drawings and one copy of the signed agreement comprising of preamble to agreement, General and Special Specification, Schedule A,B,C & D etc., (but excluding General Conditions of Contract and Drawings) and three copies of all further drawing issued the progress of work.

However, for any additional copies of the agreement of drawings required by the Contractor, the same will be supplied on payment of the specified cost.

The Contractor shall keep one copy of all the Drawings and the Specifications in the site and the Engineer-in-Charge or his representative shall be at all reasonable times to have access to them.

None of these documents shall be used by the contractor for any purpose other than that of this contract.

3a. Secrecy

The Contractor shall take necessary steps to ensure that all persons employed by them on any work in connection with this contract have noted that the Indian Officials Secret Act 1923 (XIX of 1923) & any Company's guidelines issued from time to time applies to them fully and shall continue so to apply even after the execution of such work under this contract.

All classified documents furnished to the contractor shall be returned to the Engineer-in-charge on the completion of works or the earlier determination of this Contract.

4. Works to be carried out

The Contractor shall mobilize, except as provided under Schedules "B" and "C" included all labour materials, tools, plant, equipment, and transport which may be required in preparation for and in the entire execution and full completion of the work. Schedule "A" shall be deemed to have been prepared in accordance with good practice and recognized principles and unless otherwise stated, the descriptions given therein shall be held to include waste on materials, carriage, cartage, lead, hoisting, setting and fixing in position and all other labour necessary for the entire execution and full completion aforesaid. Any error in description or quantity in Schedule "A" or any omission there from shall not vitiate the Contract or release the Contractor from the execution of the whole or any part of the work comprised therein according to the Drawings and Specifications, or from any of his obligations under the Contract.

The insertion of the name of any firm of suppliers in the Tender Documents is for the purpose of obtaining a particular class or quality of materials or workmanship but the articles or materials specified may be obtained from any other firm subject to prior written approval of the Engineer-in-Charge.

In the case of a discrepancy between schedule "A" and the specification and / or the Drawings, the Accepting Officer shall be the sole deciding authority as to which shall prevail and his decision shall be final and conclusive. If neither drawings nor specifications contain any mention of minor details of construction, which is in the opinion of the Accepting Officer, whose decision shall be final and conclusive, are reasonable and obviously and fairly intended for the satisfactory completion of the work, such details shall be provided by the Contractor without any extra cost as if they were specially mentioned and shall be deemed to be included in the contract.

The Contractor will be deemed to have satisfied himself as to the nature of the site, local facilities of access and all matters affecting the execution and completion of the work. No extra charges consequent on any mis-understanding in these respects or otherwise will be allowed.

5. Provisional Items

The full amount of provisional Lump-sums and the value annexed to each provisional item inserted in the Tender Documents shall be deducted from the contract sum and the value of work ordered and executed there under shall be ascertained by measurement of valuation as for deviations.

No work under these items is to be begun without instructions in writing from the Engineer -in-charge.

The extent of quantities or items described as "Provisional" shall not be held to guarantee or limit the amount and description of the work to be executed by the Contractor either in respect of the items concerned or the work as a whole.

No addition or deduction shall be made by the Contractor to the amount of the provisional Lump-sum as included in the tender documents.

6. Deviations

The contractor shall not make any alteration in addition to or omission from the work as described in the tender documents except in pursuance of the written instructions of the Engineer-in-charge. No such deviation from the work described in the tender documents shall be valid unless the same has been specifically confirmed and accepted by the Accepting Officer in writing and incorporated in the contract.

The Accepting Officer may deviate either by way of addition or deduction, from the work so described, provided that the contract sum is not thereby varied on the **whole by not more than percentage set out in the tender documents**. The value of all additions and deductions will be added to or, deducted from the contract sum, whenever the Accepting Officer intends to exercise such a right, his intentions shall specify the deviations which are to be made, the lump-sum assessment or the proposed basis of payment, the extra time allowed if any, and the date for completion of the entire contract.

Any objection to the Contractor to any matter concerning the order shall be communicated by him in writing to the Engineer-in-charge within seven days from the date of such order, but under no circumstances shall the work *be* stopped (unless so ordered by the Engineer-in-charge in writing) owing to differences or controversy that may arise from such an objection. In the absence such communication of objection by the contractor, he will be deemed to have accepted the order and the conditions stated therein, in the event of the contractor failing to agree with the Engineer-in-charge regarding the terms of the proposed deviation, the objection shall be referred to the Head of Civil Engineering Department whose decision shall be final, conclusive and binding on the contractor

7. Time

Time is **the essence of the contract** and is specified in the tender documents or in each individual Work Order.

As soon as possible after the contract is let or any substantial Work Order is placed and before work order is to begin, the Engineer-in-charge and the Contractor shall agree to a Time and progress Chart. The Chart shall be prepared in direct relation to the time stated in the tender documents or the Work Order for the completion of the individual items thereof and the contract or order as a whole. It shall indicate the forecast of the dates for the commencement of the various trade processes or sequence of the work and shall be amended as may be required by agreement between the Engineer-in-charge and the Contractor within the limitation of the time imposed in the tender, document or order.

In the absence of any specific Time and Progress chart to be agreed to between the Contractor and Engineer-in-charge the contractor shall ensure and maintain uninterrupted progress of the work such that the entire work shall be completed within the time imposed in the Tender documents or Order and that the proportion of the work completed up to any time in relation to the entire work to be under the Contract or Order shall not be less than the proportion that the time elapsed bears to the total time of completion provided in the Tender documents or Order.

The Contractor shall suspend the execution of the work, or any part or parts thereof whenever call upon in writing by the Engineer-in-charge to do so, and shall not resume work thereon until so directed in writing by the Engineer-in-charge. The Contractor will be allowed an extension of time for completion not less than the period of suspension. However, no other claim in this respect for compensation or otherwise, however will be admitted. Provided the cause for suspension is not attributable to any default of the contractor's part to proceed with or fulfill the contractual obligations. This may also be extended to allow for alteration of work made by the deviation order.

8. Stores and Materials

8.1 Materials to be supplied by the Contractor

The Contractor shall at his own cost and expense provide all materials required for the work other than those listed in Schedule-B which are to be supplied by Bharat Heavy Electricals Ltd.

All materials to be provided by the Contractor shall be brand new and in conformity with the specifications laid down in the contract and the Contractor shall if requested by the Engineer-in-charge furnish proof, to the satisfaction of the Engineer-in-charge, that the materials so comply.

The Contractor shall at his own cost and expense and without delay, supply to the Engineer - in -charge samples of materials proposed to be used in the works. The Engineer-in-charge shall within seven days of supply of samples or within such further period as he may require and intimate to the Contractor in writing, inform, the Contractor whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-charge for his approval fresh samples complying with the specification laid down in the contract.

The Engineer-in-charge shall have full powers to requires removal of any or all of the materials brought to site by the Contractor which are not brand new and not in accordance with the contract specifications or do not confirm in character or quality to samples approved by him. In case of default on the part of the Contractor in removing rejected materials, the Engineer-in-charge shall be at liberty to have them removed by other means at the Contractor's expense and risk. The Engineer-in-charge shall have full power to require other proper materials to be substituted for rejected materials and in the event of the contractor refusing to comply, he may cause the same to be procured by other means. All costs, charges and expenses which may attend such substitution shall be borne by the contractor. All charges on account of Octroi, terminal or sales tax and other duties on materials obtained for the work from any source (excluding materials supplied by BHEL) shall be borne by the Contractor.

The Engineer-in-charge shall be entitled to have tests carried out as specified in the Contract for any materials supplied by the Contractor other than those for which, as stated above, satisfactory proof has already been furnished, at the cost of the Contractor and the Contractor shall provide at his expense all facilities which the Engineer-in-charge may require for the purpose.

8.2 Materials to be supplied by BHEL

Materials which BHEL are prepared to supply are shown in Schedule-B which also stipulates place of issue and rate(s) to be charged in respect thereof soon after acceptance of the tender the Contractor shall agree in writing with the Engineer-in-charge on a phased programme of his requirements with regard to deliver of materials. **The Contractor shall collect the materials from the Issue Place indicated in the authorizing document issued under the seal and signature of the Engineer-in -Charge in time.**

In the event of delay in supply of any Stores and materials mentioned in Schedule-B the contractor shall be entitled to reasonable extension of time as provided for under condition-9 but no claim for compensation or damage on any ground whatsoever shall be entertained by BHEL.

For the materials listed in Schedule-B the contractor shall give a reasonable notice in writing of his requirement to the Engineer-in-charge in accordance with the phased programme.

All materials issued to the Contractor by BHEL for incorporation or fixing in the works shall on completion or on foreclosure of the works and before submission of bills, be returned by the Contractor at his expense, at the place of issue, after making due allowance for actual consumption reasonable wear and tear and / or waste. If the Contractor is required to deliver such materials at a place other than the place less the transportation charges which would have been incurred by the Contractor had such materials been delivered at the place of issue, shall be borne by BHEL.

The Contractor shall bear the cost of loading, transporting to site, unloading storing under covered area as necessary, assembling and joining the several parts together as necessary and incorporating or fixing materials in the work including all preparatory work of whatever description as may be required and of dosing preparing, loading and returning empty cases or containers to the place of issue.

If, in the opinion of the Engineer-in-charge (which shall be final and conclusive) any stores supplied by BHEL have either during currency of the work or after completion of the work whilst under the custody, of the contractor, becomes damaged to such an extent that they cannot be usefully utilized, either in the same work or in other works, the Engineer-in-charge shall not accept the stores and **will recover the cost at the** rates specified in the contract. The contractor shall not be entitled to any claim whatsoever on this account.

The Engineer-in-charge shall have access to the stores where materials issued by BHEL as per schedule -B of the contract is stored to ensure the balance stock of materials on hand after taking into consideration the materials used on the work is as per the issue and usage. If there be any discrepancy, the cost towards the same will be recovered at the **double recovery rate** indicated for the material concerned. This is without prejudice to and in addition to the overall reconciliation of materials to be made at the completion of work.

If on completion of works, the Contractor fails to return surplus materials out of those supplied by BHEL then, in addition to any other liability, which the Contractor would incur, the Engineer-in-charge may, by written notice to the Contractor, request him to pay within a fortnight of receipt of the notice for such un-returned surplus materials given in sub para-4.

The Contractor shall have to build a weather-proof shed for the storage of Cement (required for 15 days consumption of the work).

8.3 General

Materials required for the works, whether brought by the Contractor or supplied by BHEL shall be stored by the Contractor only at places approved by the Engineer-in-charge. Storage and safe custody of materials shall be at the risk, **cost** and the responsibility of the Contractor.

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

All materials brought to the site shall not be removed off the site without the prior written approval of the Engineer-in-charge. But whenever the works are finally completed and advance if any, in respect of any such materials is fully recovered the Contractor shall at his own expense forthwith remove from the site all surplus materials **out of** originally supplied by him and upon such removal the **same shall revert** in and became the property of the Contractor

Should the Engineer-in-charge consider at any time during the construction or re-construction prior to the expiry of the MAINTENANCE PERIOD that the stores or materials provided by the Contractor are unsound or of a quality inferior to that contracted for or otherwise not in accordance with Contract (in respect where of the decision of the Engineer-in-charge shall be final and conclusive) the contractor shall on demand in, writing from the Engineer-in-charge specifying the Stores or materials complained of notwithstanding that the same may have been inadvertently passed, certified and paid for, forthwith remove the Stores or materials so specified and provide other proper and suitable stores or materials at his own expense, to the entire satisfaction of the Engineer-in-charge and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in his demand aforesaid the Engineer-in-charge may replace with others the Stores or materials complained of at the risk and expense in all respects of the Contractor. The liability of the Contractor under this condition shall not extend beyond the maintenance period aforesaid except as regards Stores or materials which the Engineer-in-charge shall have previously given notice to the Contractor to replace.

9. Delay and Extension of Time:

If, in the opinion of Engineer-in-charge the work is delayed:

- i) by reason of abnormally bad weather, OR
- ii) by reason of serious loss or damage by fire OR
- iii) by reason of Civil commotion local combination of workmen, strike or lockout, affecting any of the trades employed on the work, OR
- iv) by delay on the part of the agency or tradesman engaged by BHEL in executing work not forming part of this Contract OR

- v) by reason of any other cause which in the absolute discretion of the Engineer-in-charge is (when he is the Accepting Officer of the Contract), beyond the Contractor's reasonable control, then in such cases the Accepting Officer, on the recommendation of the Engineer-in-charge or higher authority may make fair and reasonable extension in the completion dates of the individual items of work of the Contract as a whole. Such extension which will be communicated to the Contractor by the Engineer-in-charge in writing shall be final and binding on the Contractor. No other claim in this respect for compensation or otherwise howsoever is admissible. Upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-charge but shall nevertheless use constantly his best endeavor to prevent or make good the delay and shall do all that may reasonably be required to the satisfaction of the Engineer-in-charge to proceed with the work.

10. Patent Rights

The Contractor shall fully indemnify BHEL or the agent, servant, employee of BHEL against any action, claim or proceeding relating to infringement or the use of any patent or design or any alleged patent of design rights, and shall pay any royalties which may be payable in respect of any article / or part thereof included in the Contractor. In the event of any claim, being made or action brought against BHEL or any agent, or servant or employee of BHEL in respect of the matters aforesaid, the Contractor shall immediately be notified thereof for taking necessary action provided that payment of indemnity shall not apply when such infringement has taken place in complying with the specific directions issued by the BHEL but the Contractors shall pay any royalties payable in respect of any such use.

11. Taxes and Duties

Expenditure on account of Octroi, Entry Tax, Sales Tax and / or other taxes & duties on materials brought for the Work by the Contractor (excluding materials provided by BHEL on payment) shall be borne by the Contractor.

All taxes, duties, levies that are payable to the Government or to any Other Authorities in respect of the works under the contractor at the time of contract or becomes payable in future shall be exclusively borne by the contractor and BHEL is not liable for any reimbursement/ Payment thereof.

The Contractor shall have been registered under Sales TAX, Service Tax, Excise Act and Service Tax relevant for the work contracted and provide a copy of the same as a part of the tender document.

If the contractor avails or otherwise of any credit (such as CENVAT, VAT etc.), the same is to be intimated to the Company in writing by the Contractor.

For claiming Service Tax, Tax invoices under Service Tax Rules to be submitted in Original and duplicate duly signed by the Authorised Persons of the Contractor.

Inclusion of Service Tax or not in the rates quoted shall be exclusively indicated by the Contractor. Otherwise it is presumed that the same is inclusive in the rate and accordingly evaluated .

If the contractor is exempted from the payment of Works Contract Sales tax,

required exemption certificate is to be received from their jurisdictional Commercial Tax Authorities. Otherwise the works contract sales tax at applicable rate will be recovered and certificate to the effect will be given.

12. **Royalties**

Royalties fixed from time to time as per prevalent local rules will be recovered for materials, which the Contractor may be allowed to remove from quarries situated on land which is in charge of the BHEL authorities.

13. Plant and Equipment

The Contractor, shall at his own cost and risk, supply all tools, plant and equipment (here-in-after referred to as T & P) required for the execution of the contract other than those listed in Schedule - C which subject to their availability may be supplied by BHEL to the Contractor or Issued free for use in the execution of the work, as specified in Tender documents. In case of not provision by the Company, the Contractor may arrange the same at the agreed terms with the Company.

14. Assignments or Transfer of Contract

The Contractor shall not without the prior written approval of the Accepting Officer assign or transfer the Contract or any part thereof, or any share, or interest there in to any other person. No sum of money which may become payable under the Contract shall be payable to any person other than the Contractor unless the prior written approval of the Accepting Officer to the assignment or transfer of such money is given.

14 (a) Sub - Contract

The Contractor shall not sub-let any portion of the Contract without the prior written approval of the Accepting Officer.

15 Compliance to the Regulations and Bye - Laws

The Contractor shall confirm to the provision of any statute relating to the work and regulations and bye-laws of any local authority and of any water and lighting Companies or Undertakings with whose system the work is opposed to be connected, He shall, before making an/ variation from the drawings or, the specifications that may be necessitated for such connections give the Engineer - in - charge notice, specifying the variation proposed to be made and the reasons there for and shall not carryout any such variation until he has received instructions from the Engineer-in-charge in respect thereof. The Contractor shall be bound to give all notice required by Statute Regulations of Bye-laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

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CHAPTER -III

PERFORMANCE OF THE CONTRACT

Security Deposit

18.1.1 Security Deposit should be collected from the successful tenderer. The rate of Security Deposit will be as below:

Up to Rs, 10 lakhs	:10%
Above Rs. 10 lakhs up to Rs.50 lakhs	:Rs1 Lakh + 7.5% of the amount Exceeding Rs, 10 lakhs.
Above Rs, 50 lakhs	Rs.4 lakhs + 5% of the Amount Exceeding Rs, 50 lakhs.

The security Deposit should be collected before start of the work from the contractor.

18.1.2 Security Deposit may be furnished in any one of the following forms:

- i) Cash (as permissible under the Income Tax Act).
- ii) Pay Order, Demand Draft in favour of BHEL.
- iii) Local cheques of scheduled banks, subject to realization.
- iv) Securities available from Post Offices such as National Savings 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),
- v) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL.
- vi) 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, A/C BHEL, duly discharged on the back.
- vii) Security deposit can also be recovered at the rate of 10% from the running bills. However in such cases at least 50% of the Security Deposit should be collected before start of the work and the balance 50% may be recovered from the running bills.
- viii) **EMD of the successful tenderer can be converted and adjusted against the security deposit.**
- ix) The security deposit shall not carry any interest.

(NOTE: Acceptance of Security Deposit against SI No. (iv) and (vi) 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).

18.1.3 Security deposit shall not be refunded to the contractor except in accordance with the terms of the contract,

18.1.4 All compensation or other sums of money payable by the contractor to BHEL, under the terms of this contract or under any other contract with BHEL, may be deducted from the security deposit or realized by the sale of the securities or from the interest arising there from or from any sums which may be due or may become due to the contractor payable by BHEL on any account whatsoever against this contract or any other contract with BHEL, and in the event of his security deposit being reduced by reason of such deduction or sale as aforesaid, the contractor shall within seven days thereafter make good in cash or in securities endorsed as aforesaid, any sum or sums by which the security deposit has been so reduced.

18.1.5 50% of the security deposit may be refunded on completion of the work after payment of the final bill and the balance 50% of the security deposit is refundable only after the expiry of the maintenance period of six (6) months from date of completion of work as stipulated in the contract concerned.

provided the Contractor shall have rendered a "No - Demand" Certificate. In case of work where maintenance period is not involved 100% of the Security Deposit may be refunded after payment or final bill provided that the Contractor shall have rendered a "No Demand" Certificate.

19. Orders Under the contract

All orders, notices, etc., to be given under the contract shall be in writing, typescript or printed and if sent by registered post to the address given in the tender of this Contractor, shall be deemed to have been served on the date when in the ordinary course they would have been delivered to him.

The Contractor shall carry out without delay all orders given to him.

20, Admission to Site

The contractor shall not enter on (other than for inspection purposes) or take possession of the site unless permitted to do so by the Engineer-in-charge. The portions of the site to be occupied by the Contractor will be clearly defined and marked on the site plan, and the contractor will not be allowed to extend his operations beyond these areas. The Contractor shall provide if necessary or required at the site, temporary access thereto and shall alter, modify and maintain the same as required from time to time. He shall clear away the access route when no longer required restoring the area to its original condition¹:

The Engineer-in-charge shall have power to execute other works (whether or not connected with the work, in the contract agreement) at the site contemporaneously with the execution of the original work and contractor shall give reasonable facilities for this purpose.

BHEL reserves the right of taking over, at any time, any portion of the site which they may require and the contractor shall at his own expense clear such portion forthwith. No photographs of the site or of the work or any part there of shall be taken or published or otherwise circulated without the prior approval of the Engineer-in-charge.

No such approval shall however exempt the Contractor from complying with any statutory provision in regard to the taking and publication of such photographs.

BHEL Officials connected with the Contract shall have the right of entry to the site at all times.

Engineer-in-charge shall have the power to exclude from the site any person whose admission there to may, in his opinion is undesirable for any reason whatsoever.

The Contract shall be governed by the security regulations of BHEL including the entry or exit timings as may be in force from time to time. The Contractor should follow these regulations strictly and no claims for any additional payment whatsoever will be entertained in this regard under any circumstances.

21. Contractor's Supervision

The Contractor shall either himself supervise the execution of the Contract or shall appoint a competent person approved by the Engineer-in-charge to act in his stead. The Contractor shall employ an Engineer/Agent having at least a Degree of Bachelor of Civil Engineer from a recognized University/on any work with a Contract value exceeding rupees two lakhs, and having atleast a Diploma in civil Engineering from a recognized college, on work with a contract value exceeding Rs. 50,000 but not exceeding rupees two lakhs.

The Employment of an Engineer/Agent as aforesaid shall not be necessary if the Contractor himself is in possession of a recognized technical qualification and is, in opinion of the Engineer-in-charge, capable of the receiving instructions of the Engineer-in-charge and of the executing the work to the satisfaction of the Engineer-in-charge. If the Contractor fails to appoint a suitable Engineer/Agent as aforesaid, the Engineer-in-charge shall have full powers to suspend the execution of work and stop payment of any advances that may have become due until such date as a suitable Engineer/Agent is appointed and the Contractor shall be held responsible for the delay caused to the work and no extension of time on this account shall be given to him as stipulated in condition (9) above.

Orders given to the Contractor's Agent Engineer shall be considered to have the same force as if they had been given contractor himself.

The Contractor or his Agent shall be in attendance at the site during all working hours and shall superintend the executing of work with such additional assistance in each trade as the Engineer-in-charge may consider necessary.

The Contractor or his accredited agent shall attend when required and without making any claim for doing so, either the Office of the Engineer-in-charge or the work site to receive instructions.

The Engineer-in-charge shall have full powers, and without assigning any reason to require the Contractor immediately to cease to employ in connection with the Contract, any Agent, servant or employee whose continued employment is, in his opinion undesirable.

The contractor shall not be allowed any compensation on this account

22. Labour

The contractor shall employ labour in sufficient numbers either directly or through sub-contractors to maintain the required date of progress and of quality to ensure workmanship to the degree specified in the contract and to the satisfaction of the Engineer – in – charge. The contractor shall not employ, in connection with the works, any person who has not completed eighteen years of age.

The Contractor shall pay to labour employed by him, either directly or through sub-contractors, wages not less than fair wages, as defined in the Contractor's Labour Regulations.

The Contractor shall in respect of labour employed by him, either directly or through sub-contractors, comply with or cause to be complied with contractor's labour Regulations in regard to all matters provided therein.

The Contractor shall comply with the provisions of the payment of Wages Act, 1936, Minimum Wages Act, 1948, Workmen's Compensation Act 1923, Industrial Disputes Act, 1947, Maternity Benefit Act 1961, or any modifications thereof or any other law relating there to and rules made there under from time to time.

The Contractor shall be liable to pay his contribution and the employee's contribution of the State Insurance Scheme in respect of all labour employed by him for the execution of the contract, in accordance with the provision of "The Employees' State Insurance Act, 1948" as amended from time to time. The Contractor shall apply to the ESI Authorities, get himself registered with them and obtain a code Number. He shall pay the remittances under his Code Number only.

The Contractor shall be liable to his contribution and the employees contribution towards PF as per Provident Fund Rules and Regulations, in respect of all labour employed by him for the execution of the contract. The Contractor shall apply to the PF Authorities, get himself registered and obtain a code number from them. He shall pay the remittances towards PF under his code number only.

The Engineer-in-charge shall, on a report having been made by an Inspecting Officer as defined in the Contractor's Labour Regulations, have the power to deduct from the moneys due to the contractor any sum required or estimated to be required, for making good the loss suffered by a worker or workers by reason of non fulfillment of the conditions of the contract for the benefit of workers, non-payment of wages or of deductions made a from his or their wages which are not justified by the terms of

the Contract of non observance of the said Contractor's Labour Regulations.

The Contractor shall indemnify BHEL against any payment to be made under and for observance of the Regulations aforesaid without prejudice to his right to claim indemnity from his sub-contractors.

In the event of the Contractor committing a default or breach of any of the provisions of the aforesaid contractor's Labour Regulations, as amended from time to time or furnishing any information or submitting or filling any form/Register/Slip under the provisions of these Regulations which is materially incorrect, then, on the report of the Inspecting Officers as defined in the Contractors Labour Regulations, the Contractor shall without prejudice to any other liability pay to BHEL a sum not exceeding Rs. 50/- as liquidated damages for every default, breach, or furnishing, making, submitting, filling materially incorrect statements as may be fixed by the Engineer-in-charge and in the event of the contractor's default continuing in this respect, the liquidated damages may be enhanced to Rs. 50/- per day for each day of default subject to a maximum percent of the estimated cost of works put to tender. The Contractor shall defend the case by himself any action brought in by such Government Agencies for non-compliance of any Labour Regulations and / or reimburse the expenses incurred by BHEL in this regard.

The Engineer-in-charge shall deduct such amount from bills or security deposit of the Contractor and credit the same to the welfare fund constituted under Regulations. The decisions of the Engineer-in-charge in this respect shall be final and binding.

MODEL RULES FOR LABOUR WELFARE

The Contractor shall, at his own expense, comply with or cause to be complied with Model Rules for Labour Welfare as appended to these conditions or rules framed by Government from time to time, for the protection of health and for making sanitary arrangements for workers employed directly or indirectly on the works. In case the Contractor fails to make arrangements as aforesaid, the Engineer-in-charge shall be entitled to do so and recover the cost there from the contractor.

The contractor shall employ labour in sufficient number either directly or through sub-contractors to maintain the required rate of progress and of quality ensure

Workmanship of the degree specified in the contract and to the satisfaction of the Engineer-in-charge. The contractor shall comply with all (REF in force from time to time.(ref:[Annexure I](#))

23. Safety Rules

The Contractor shall comply with all safety rules of BHEL

SAFETY CODE

RESPONSIBILITIES OF THE CONTRACTOR IN RESPECT OF SAFETY OF MEN, EQUIPMENT, MATERIAL AND ENVIRONMENT

1. Before commencing the work, the contractor is required to submit a "SAFETY PLAN" to the authorized BHEL official. The 'safety plan' shall indicate, in detail, the measure that would be taken by the contractor to ensure safety of

men, equipment, material and environment during execution of work. The plan shall take care to satisfy all requirements specified hereunder. The contractor shall submit safety plan along with his offer. During negotiations before placing of work order and during execution of the contract, BHEL shall have right to review and suggest modification in the safety plan. The contractor shall abide by BHEL's decision in this respect.

2. The contractor shall take all necessary safety precautions and arrange for appropriate appliances as per direction of BHEL, or its authorized officials, to prevent loss to human lives, injuries to personnel engaged, and damage to property and environment.
3. The contractor shall provide to its work force and ensure the use of the following personal protective equipment as found necessary and as directed by the authorized BHEL officials:-

- (i) Safety helmets conforming to IS-2925: 1984.
- (ii) Safety Belts conforming to IS-3521:1983
- (iii) Safety Shoes conforming to IS-1989:1978.
- (iv) Eye and Face protection devices conforming to IS-8520:1977. and IS-8940:1978.
- (v) Hand and body protection devices conforming to

(1) IS-2573:1975 (2) IS-6994:1973 (3) IS-8807:1978 (4) IS-8519:1977.

All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, safety nets, ladders, equipment etc. used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained, before putting them to use and from time to time as instructed by authorized BHEL official who shall have the right to ban the use of any item.

All the electrical equipment, connections and wiring for constructions, power, its Distribution and use shall conform to the requirement of Indian Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carry out the all types of electrical works. All electrical appliances including portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed.

The contractor shall not use any hand – lamp energized by electric power with supply voltage of more than 24 Volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 Volts.

The contractor shall adopt all fire safety measures as laid down in the “Code for Fire Safety at Construction sites” issued by the safety department of BHEL and as per the directions of the authorized BHEL official. A copy of the above referred “Code for Fire Safety at Construction sites” shall be made available by BHEL to the contractor for reference, on demand by the contractor, during tendering stage itself.

Where it becomes necessary to provide and/or store Petroleum Products, explosives, chemicals and liquid or gaseous fuel or any other substance that may cause fire or explosion, the contractor shall be responsible for carrying out such

provisions and / or storage in accordance with the rules and regulations laid down in the relevant government acts, such as Petroleum Act, Petroleum and Carbides of Calcium Manual of the Chief Controller of Explosives, Govt. of India etc., Prior approval of the authorized BHEL official at the site shall also be taken by the contractor in all such matters.

The contractor shall arrange at his cost (wherever not specified), appropriate illumination at all work spots for safe working when natural daylight may not be adequate for clear visibility.

The contractor shall be held responsible for any violation of statutory regulations local, state or central and BHEL instructions, that may endanger safety of men, equipment, material and environment in his scope of work or another contractor's or agency's. cost of damages if any, to life and property arising out of such violation of statutory regulations and BHEL instructions, shall be borne by the contractor.

In case of fatal or disabling injury/accident to any person at construction sites due to lapses by the contractor, the victim and/or his/her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the contractor for suitably compensating the victim and/or his/her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.

In case of any damage to property due to lapses by the contractor, BHEL shall have the right to recover cost of such damages from payments due to the contractor after holding an appropriate enquiry.

In case of any delay in the completion of a job due to mishaps attributable to lapses by the contractor, BHEL shall have the right to recover cost of such delay from payments due to the contractor, after notifying the contractor suitably and giving him opportunity to present his case.

If the contractor fails to improve the standards of safety in its operation, to the satisfaction of BHEL, after being given a reasonable opportunity to do so and / or / if the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorized BHEL official, BHEL shall have the right to take corrective steps at the risk and cost of the contractor, after giving a notice of not less than seven days, indicating the steps that would be taken by BHEL.

The contractor shall submit report of all accidents, fires and property damage, dangerous occurrence to the authorized BHEL official immediately after such occurrence, but in any case not later than twelve hours of the occurrence. Such reports shall be furnished in the manner prescribed by the contractor to the authorized BHEL official from time to time as prescribed.

Before commencing the work, the contractor shall appoint/nominate a responsible office to supervise implementation of all safety measures and liaison with his counterpart of BHEL.

If the Safety record of the contractor is to the satisfaction of Safety

Department of BHEL, issue of an appropriate certificate to recognize the safety performance of the contractor may be considered by BHEL after completion of the job.

24. Water,Power and Compressed Air

The Contractor shall allow in his Tender and provide at his cost all water, power, compressed air required for the work or his employees on the work, together with all pipes and fittings or other means that may be necessary or required to ensure a proper and ample supply of water etc for all purposes connected with the work.

In the event of a provision existing in the Tender documents for supply of water, power and compressed air on payment by Bharat Heavy Electricals Limited, the same will be supplied from the BHEL supply system or other sources. at any points fixed by the Engineer-in-charge on the site of work, the contractor shall make necessary arrangement for lifting, pumping, carrying or Conveying the the same as .required at his own cost. **The levy of charges to be borne by the contractor in such case shall be specifically mentioned in the tender documents.**

In the case of work to be carried at BHEL'S customer's site, the terms and conditions on the provision of power, water and compressed air will be subjected to BHEL contract with customer and tender conditions.

25. Temporary workshops, store Etc,

The Contract shall, during the progress of the work provide, erect and maintain at his own expense all necessary temporary workshops. Offices etc., required for the proper and efficient execution of the work. The planning, and erection of these buildings shall have the approval of the Engineer-in-charge and the Contractor shall at times keep them tidy and in a clean and sanitary condition to the entire satisfaction of the Engineer-in-charge.

On completion of the work all such temporary building shall be cleared away and the site restored and left in a dean and tidy condition to the entire satisfaction of the Engineer - in - charge.

26. Tool and Plant on site

All tools, plant and equipment brought to. the site shall not be removed from the site without the prior written approval or the Engineer-in-charge. When the work is finally completed or the contract is determined for reasons other than the default of the contractor he shall, forth with remove from the site all tool plant, equipment etc.. (other than those as may have been provided by BHEL)

27. Statements of Hire Charges

A monthly detailed statement of the hire charge incurred in respect of BHEL tools, plant, equipments etc. shall be given to the Contractor by the Engineer-in-charge.

28. Precaution Against risks

The Contractor shall be responsible for providing at his own expense, for all precaution to prevent loss or damage and for the necessary steps to be taken for the said purpose until the works have been handed over complete, in all respects to the Engineer-in-charge.

The Contractor shall provide all watchmen necessary for the protection of the site, the work, the materials, tools, plant, equipment and anything else lying on the site during the progress of the work. He shall solely be responsible for and shall take all reasonable and proper steps for protecting, securing, lighting and watching all places on or about the work and the site which may be dangerous to any person whomsoever.

29. Notices and fees

The Contractor shall give all notices required by any Statutory provision or by the regulations and for bye-laws of any local / or of any same are or will be connected. The contractor shall pay and indemnify BHEL against any statutory fees and charges payable under such Acts, Regulation and / or bye-laws in respect of the work and shall make and supply all drawings and plans required in connection with any such notice.

30. Setting out of the works and Protective and Maintaining signals and works

The Engineer-in-charge shall supply dimensioned drawings, levels and other information necessary to enable the contractor to set out the work, the contractor shall at his own expense set accurately according to the drawings and figured dimension thereon, all the work comprised in the contract and any extras or additions there to and shall be solely responsible for their being so set out and executed.

All bench marks, pegs, signals on the surface alignment stones, milestones and all similar marks whether put in by BHEL Authorities for the purpose of checking the Contractor's work or in the nature of permanent survey marks will during the tenure of the contract, be under the care of the Contractor who shall at his own expense take all proper and reasonable precautions and care to preserve and maintain them in their true position. In the event of these marks being disturbed or obliterated by accident or due to any other cause whatsoever, the same may, if deemed necessary be replaced by the Engineer-in-charge at the Contractor's expense and the cost thereof be deducted from any money then or thereafter becoming due to the Contractor

Where requested by the Contractor, the level marks, centre line and chain age pegs corresponding to those shown on the Drawing will be pointed out to the Contractor on the ground but all bench marks or chain age pegs additional to those shown on the Drawing will be set out by BHEL authorities.

31. Site Drainage

All water that may accumulate on the site during the progress of the work, or in trenches and excavations shall be removed to the entire satisfaction of the Engineer-in-charge and at Contractor's expense.

32. Excavation, Relics, etc.

Materials of any kind obtained from excavation on the site shall remain the property of BHEL and shall be disposed off as Engineer-in-charge directs.

All gold, silver, oil and other minerals of any description and all precious stones coins treasures, relics, antiquities and other similar items which may be found in or upon the site shall be the property of Bharat Heavy Electrical Limited and the contractors shall duly preserve the same to the satisfaction of the BHEL and shall from time to time deliver the same to such person or persons as the BHEL may appoint to receive the same.

33. Foundations

The Contractor shall not lay any, foundations until the excavations for the same have been examined and approved in writing by the Engineer - in-charge.

34. Covering in work

The Contractor shall give reasonable notice in writing to the Engineer - in-charge whenever any work is to be permanently covered up or concealed, whether by earth or other means so that it can finally be inspected or measured, if necessary. In default of so doing, the Contractor shall if required by the Engineer-in-charge un-cover such work at his own expense.

35. Approval of Works by Stages

All work embracing more than one process shall be subject to examination and approval at each stage thereof and the Contractor shall give due notice in writing to the Engineer-in-charge when each stage is ready. In default of such notice being received, the Engineer-in-charge shall be entitled to approve the quality and extent thereof at any time he may choose and in the event of any dispute, the decision of the Engineer-in-charge thereon shall be final conclusive.

36. Execution of the work

The work shall be executed in a workman like manner and to the satisfaction in all respects of the Engineer-in-charge.

The Engineer-in-charge will communicate or confirm his instructions to the Contractor in respect of the execution of the works in a "**Work Site Order Book**" maintained at his office and the Contractor shall visit this office daily and shall confirm receipt of such instruction by signing the relevant entries in this book. Such entries will rank as order to notices in writing the intent and meaning of these conditions.

37. Day Work

No 'day – work' shall be performed without the prior written instructions of the Accepting Officer.

The Contractor shall give to the Engineer-in-charge reasonable notice of the start of any work ordered to be executed by day-work and shall deliver to the Engineer-in-charge within two days of the end of each pay week a return in duplicate giving full detailed accounts of labour and materials for the pay week. One copy of each of these returns, if found correct will be certified by the Engineer-in-charge and returned to the Contractor and must be produced at the time of adjustment of accounts.

An Invoice in duplicate signed by the Contractor or his agent shall be sent with each delivery of materials for day-work and the Contractor will be furnished with receipt signed by the Engineer-in-charge specifying the description, quantities, weight or measurement (as the case may be) of the articles approved, reference will be made in this receipt in the return aforesaid and the Contractor's Bill.

In the case of Lump sum Contracts, the rates to be charged and the percentage addition for profit and establishment charges etc. will be agreed upon between the Accepting Officer and the Contractor prior to the execution of the work.

38. Inspection of the Work

BHEL Officers concerned with the contract shall have power at any time to inspect and examine any part of the work and the Contractor shall give such facilities as may be required to be given for such inspection and examination.

Should Engineer-in-charge consider, at any time during the expiry of the maintenance period, that any work has been executed with unsound, imperfect or unskilled workmanship or of a quality inferior to that contracted for or not otherwise in accordance with the contract (in respect). Where of the decision of the Engineer-in-charge shall be final and conclusive the contractor shall, on demand in writing from the Engineer-in-charge specifying the fault notwithstanding that the same may have been inadvertently passed, certified and paid for, forthwith rectify or removed and reconstruct the work so specified in whole or in part and the case may require at his own expense to the entire satisfaction of the Engineer-in-charge and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in his demand as aforesaid, the Engineer-in-charge whose decision shall be final and binding may carry out the work by other means at the risk and expense in all respects of the Contractor. However, the liability of the Contractor under this condition shall not extend beyond the maintenance period except as regards workmanship which the Engineer-in-charge shall have previously given notice of to the Contractor to rectify.

39. Responsibility for Building

In the event of any building or part of any building being handed over to the Contractor for the execution of work there to under the provisions of the Contract he shall give a written receipt for all fixtures, glass etc., and he shall be required to make good at his own expense all damages resulting from the cause whatsoever while in his charge and on completion of the work to deliver the said building or part thereof in a clean state complete in every particular to the entire satisfaction of the Engineer-in-charge.

40. Insurance

The contractor shall, within one month after the date of acceptance of the contract, insure the work on **"all risks" basis** against loss and damage by fire, tempest, floods, earthquake, riots, strike and against damage by aircraft with an insurance office approved by the accepting officer, from the date of acceptance of work or actual commencement of work whichever is earlier. Such insurance shall be effected in the name of BHEL and shall be for the full value of the contract sum. The contractor shall lodge with BHEL the policies and receipts of the premiums for such insurance and shall maintain such policies in force until the entire completion of the work as certified by the Engineer-in-charge. The cover shall also include whenever necessary the risks of testing including breakdown or explosion or plant and machinery undergoing testing, trial and commissioning operations. The insurance shall also specifically cover removal of debris cost. The sum Insured shall represent the estimated full value of the contract work inclusive of value of free supply materials by BHEL, transport charges, customs dues, express freight, overtime charges, cost of erection, value of constructional plants and machinery; removal of the debris

and excavation of costs. Where the contract includes a maintenance period, the Insurance cover shall specifically include the Contractor's liabilities during the maintenance period. The insurance shall also be extended to cover third party personal injury and property damage for a sum to

be specified by BHEL.

If the contractor fails to comply with the terms of this condition, the accepting officer may insure the work and may deduct the amount of premiums from any money that may become payable to the contractor or may at his discretion refuse payment of any advance payment to the contractor until the contractor shall have complied with the terms of this condition.

Such insurance whether effected by the Accepting officer or the Contractor shall not be a limit or bar to the liability and obligation of the contractor to complete the entire work in all respects as certified by the Engineer-in-charge.

In case of such a loss or damage as aforesaid, the money payable under any such insurance shall be received and may be retained by BHEL until the work is finally completed and shall then be credited to the contractor in the final statement of accounts in the event of the contract not having been previously cancelled under these conditions, after taking into account the delay in completion, settlement to his workers for damages, damage to BHEL's property etc.

41. Damage and Loss to Private Property and Injury to Workmen

The Contractor shall at his own expense reinstate and make good to entire satisfaction of the Engineer-in-charge and pay compensation for any injury, loss or damage occasioned to any property or rights whatever including property and rights of BHEL (or agents, servants to employees of BHEL) the injury loss of damage arising out of or in any way in connection with the execution of *the* contract and further the Contractor shall indemnify BHEL against all claims enforceable against BHEL or any agent, servant, or employee of BHEL ,a private person, in respect of any such injury (including injury resulting in death loss or damage to any person) whomsoever or property, including all claims which may arise under the Workmen's Compensation Act or otherwise, or which would be enforceable against BHEL.

42 Completion:

The works shall completed to the entire satisfaction of the Engineer - in -charge and in accordance with the Contractor's forecast of Time and progress where operative, and all unused stores and materials, tools, plants equipment, temporary Building and things shall be removed from the site and work cleared of rubbish and all waste materials and leveled up clean and tidy to the satisfaction of the Engineer-in-charge at the Contractor's expense and/or before the Schedule date of completion.

The BHEL shall have power to take over from the Contractor from time to time such sections of the Work as have been completed to the satisfaction of the Engineer-in-charge. In such an event, the contractor is not entitled for any extension of time or any other compensation for executing the balance work In case the Contractor fails to remove any of his properties, assets or fails to clear the rubbish and waste materials within 30 days of the completion of the contract, it is lawful for the contracted, that is BHEL to take such action as it deems fit to clear, dispose of such properties, assets or such waste materials and charge the Contractor any expenses Incurred thereon.

The Engineer-in-charge shall certify to the Contractor the date on which the work is completed and the state thereof.

The Engineer-in-charge shall also certify to the Contractor the state of the work at the end of maintenance period, where applicable.

43, Compensation for delay

If the Contractor fails to maintain the required progress in terms of condition 7 or to complete the work and clear the site on or before the contracted or extended period of completion, he shall, without prejudice to any other right or remedy of the BHEL on account of such breach pay as agreed compensation an amount calculated as stipulated below or such smaller amount as may be fixed by the BHEL on the contract value of the work for every week that the progress remains below that specified in condition 7 or that the work remains incomplete.

This will also to items or groups of items for which separate period of completion has been specified.

For the purpose me term "Contract Value" shall be the value at contract rates of the work or ordered,

- | | |
|--|--------------------------|
| a) Completion period (as originally stipulated) not exceeding 6 months | at 1 per cent per week |
| b) Completion period (as originally stipulated) exceeding 6 months and not exceeding 2 Years | at ½ per cent per week |
| c) Completion period (as originally stipulated) exceeding 2 years | at ¼ % per cent per week |

Provided always that the total amount of compensation for delay to be paid under this condition shall not exceed the under noted percentage of the contract value or of the item or group of items of work for which a separate period of completion is given

- | | |
|--|-------------|
| a) Completion period (as originally stipulated) not exceeding 6 months | 10 per cent |
| b) Completion period (as originally stipulated) exceeding 6 months and not exceeding 2 Years | 7½ per cent |
| c) Completion period (as originally stipulated) exceeding 2 years | 5 per cent |

The amount of compensation may be adjusted or set-off against any sum payable to the contractor under this or any other contract with the BHEL.

44. Laws Governing the Contract

This Contract shall be governed by the Indian Laws for the time being in force.

45. Cancellation of Contract for Corrupt Acts

The Accepting Officer, whose decision shall be final and conclusive, shall without prejudice to any other right or remedy which shall have accrued or shall accrue thereafter to Bhart Heavy Electricals Limited, cancel the Contract in any of the following cases and the contractor shall be liable to make payment to BHEL for any loss or damage resulting from any such cancellation for default.

If the Contractor shall:

- a) Offer or give or agree to give to any person in BHEL service any gift or consideration of any kind as an inducement or reward for doing or for bearing to do or for having done or forborne to do a day act in relation to the obtaining or execution of this or any other contract for BHEL service OR
- b) Enter into a contract with BHEL in connection with which commission has been paid or agreed to be paid by him or with his knowledge, unless the particulars of any such commission and the terms of payment thereof have previously been disclosed in writing to the Accepting Officer, OR
- c) Obtain a contract with BHEL as a result of ring tendering or by non-bonafide methods of competitive tendering without first disclosing the fact in writing to the Accepting Officer.'

46. Cancellation of Contract for Insolvency, Assignment or Transfer or Sub-Letting of Contract

The Accepting Officer; without prejudice to any other or remedy which shall accrue thereafter to BHEL shall cancel the contract in any of the following cases:

If the Contractor

- a) being an individual, or if a firm any partner thereof shall at any time be adjudged bankrupt or have a receiving order or orders for administration, of his Estate made against him or shall take and proceedings, for liquidation or composition under any Bankruptcy Act for the time being in force or make any conveyance of assignment of his effects composition or arrangement for the benefit of his credit or purport to do so, or if any application be made under any Bankruptcy Act for the time being in force for sequestration of his Estate or if a trust deed be granted by him on behalf of his creators, OR
- b) Being a company shall pass a resolution or the court shall make an order for the liquidation of its affairs, or a Receiver or Manager on behalf of the debentures holders shall be appointed or circumstances shall arise which entitle the court or debentures holders to appoint a Receiver or Manager OR
- c) assigns, transfer, sub-lets or attempts to assign, transfer or sub-let any part of the work without the prior written approval of the Accepting Officer OR
- d) Shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.

Whenever the Accepting Officer, exercises his authority to cancel the contract under this condition, he may complete the work by any means at the Contractors expense provided always to that in the event of the cost of completion as certified by Engineer-in-charge which is final and conclusive) being less than that contract cost, the advantage shall accrue to the BHEL and that if the completion exceeds the moneys due to the Contractor under the contract shall either pay the excess amount ordered by the Engineer-in-charge or the same shall be recovered from the Contractor by other means.

Engineer-in-charge will have powers to take possession of the site and any materials constructional plant, implements, stores, etc. thereon and carryout the work by any means at the risk and cost of the Contractor.

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

In 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 all of the Contractor's unused materials, constructional 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 thereafter be any balance outstanding from the Contractor, it shall be recovered in accordance with the provisions of the Contract.

47. CANCELLATION OF CONTACT IN PART OR FULL FOR CONTRACTOR'S DEFAULT IF THE CONTRACTOR:

- a) makes default in commencing the within a reasonable time from the date of handing over of the site and continue in that state 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 diligenece and continue in the state after a notice of seven days from Engineer- i n- charge OR
- c) fails to comply with any of the terms and conditions of the contract or after 7days notice in writing with orders properly issued there under, OR
- d) fails to complete the work order and items of work individual dates for completion and clear the site on or before the date of completion or fails to achieve the progress at set out under clause 7 of these General conditions of contract.

The Accepting Officer may, prejudice to any other right or remedy which shall have accrued or shall accrue after BHEL, Cancel the contract as a whole or in part there 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 the BHEL completes the work or any part there of under the provisions, of the condition the of such completion to be taken in to account in determining the excess cost to be charged to the contract under this condition shall consist of the cost of materials purchased and /or labour provided by the BHEL. with an addition of such percentage to cover superintendance and establishment charges as may be decided by the General Manager whose decision shall be final and conclusive.

If the contract 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 there of towards the satisfaction of any sum due from the contractor under the contract and if there be any balance out-standing .from the contract, it shall be recovered i n accordance with the provisions of the contract.

48. Termination of Contract for death

Without prejudice to any of the rights or remedies under this contract, if the contractor dies, the Accepting officer shall have the option of terminating the contract without compensation to the contractor,

49. Special Powers of Determination

If at any time after the acceptance of the tender BHEL shall whatsoever not require the whole or any part of the work to be Manager shall give notice in writing of the fact to the contractor who shall have no claim to any payment of compensation or otherwise howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the foreclosing of the work.

He shall be paid at contract rates for the full amount of the executed including such additional works, e, g. clearing of site, etc., as may be rendered necessary by the said foreclosing. ***He shall also be allowed a reasonable payment (as decided by the Accepting office)*** for any expenses sustained on account of labour and 'materials collected but which could not be utilized on the work, as verified by the Engineer-in-charge. Neither shall the contractor have any claim for compensation on account of any alterations have been made fn the original specifications, drawings, designs and instructions, involving any curtailment of the work as original contemplated.

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CHAPTER -IV

VALUATION AND PAYMENT

1. RECORDS AND MEASUREMENTS:

All items having a financial value shall be entered in the BHEL Measurement Book (MB) so that a complete record is obtained of all works performed under the contract. Buildings, etc., priced in schedule 'A' as a unit Lump-sum will be entered by number at the unit Lump-sum.

Work carried out for agreed Lump-sum will be described and similarly recorded

Lump-sum omissions will be entered for deduction. Measurement shall be restricted to that required to ascertain the financial liability of BHEL "under the contract"

Work, which fails to be measured in detail shall be measured physically, without reference to any local custom that may obtain excepting where it may otherwise be directed in the tender documents. The measurements **shall be taken jointly** by any person duly authorized on the part of the BHEL and-by the contractor.

The engineer -in-charge shall give reasonable notice in writing to the contractor the date **of appointment of measurement.**

The contractor shall without, extra charge, provide assistance with appliance and other things necessary for-measurement.

The contractor shall bear all the cost of measurements of his work.

Measurements shall be entered in the BHEL measurement book and signed and dated by both parties each day at the site, on completion of measurement. If the contractor objects to any of the measurements recorded on behalf of the BHEL, a note to that effect to be made in the BHEL measurement book or against the item or items objected to; and such note shall be signed and dated by both the parties' engaged in taking the measurement.

If as a result of such objection, it becomes necessary to re-measure the work wholly or impart the expense of such measurement shall be borne by the party requiring the measurement.

Measurement to be re-taken provided that a net error is found by this re measurement to amount to less than 5% (Five percent) of the value as-recorded by the first measurement .But where the net errors amount to 5% and over of the said value then the cost is to be borne by the other party. In any case if the net value of errors found exceeded to Rs. 500 the expense or re-measurement is said to be borne by th other party. If the contractor's representative fails to attend when required, the Engineer-in-charge shall have power to proceed by himself to take measurement and in that case those measurements shall be considered as accepted by the contractor as final. The contractor shall, once in every month submit to the engineer-in-charge with a copy to the Accepting officer details, of his claims for the work done by him up to and including the previous month, which are covered by his contract agreement in any of the following respects.

- a) Deviation from the items and specifications provided in the contract documents.
- b) Extra Items / Items of work,
- c) Quantities in excess of those provided in the contract schedule.
- d) Items in respect of which rates have not been settled. He should, in addition furnish a clear certificate to the effect **that** the claims submitted by him as aforesaid cover all his claims and that no further claims shall be raised by him in respect of work done up to and including the period under report.

Except where any general to detailed description of the work in quantities expressly shows to contrary, schedule of quantities shall be deemed to have been prepared and measurements shall be taken in accordance with the procedure set forth in the schedule of rates specification notwithstanding any provision in the relevant standard method of measurement or any general or local custom. In the case of items which are not covered by the schedule of rates / specification, measurement shall be taken in accordance with relevant standard method of measurement issued by the Indian Standard institution or as per Standard engineering practice,

2 VALUATION OF DEVIATIONS

Rates for deviated items of work will be fixed as follows:

- 1) For any item of work required to be carried out after the contract has been awarded and which is not covered by Contractor's Schedule but is covered by B.H.E.L schedule of Rates the payable for such a fresh item will be derived from B.H.E.L. Schedule by the method of proportion as follows:
 - a) In the same proportion to the **BHEL** Schedule of rates as the tendered rate for the nearest analogous item of work in contractor's schedule bears to rate for the particular analogous item of work in BHEL schedule of rates. However in case of nearest analogous item of work in contract schedule forms part of individual chapter of the BHEL schedule of rates the above proportion will be worked out only for such items which are found both in contract schedule and BHEL Schedule of rates as group of items under the chapter.
 - b) If a single appropriate analogous item of work is not available in both schedule (contractor's and BHEL schedule) then the method of proportion will be applied to the nearest analogous group items available in both the schedule referred to i.e., in the same proportion as the total tendered cost of that particular group of item (the sum of the products of the tendered rates and the quantities for which orders are placed) bears to the total cost of the same items and quantities and BHEL Schedule of Rates.

- c) If even an appropriate analogous group of items is not available in contractor's schedule and BHEL Schedule, then the methods of proportion will be applied to all those items of the whole work, which are available in both the schedule and for which orders have been placed on the contractor i. e., in the same proportion as the total cost of all these items of work (the work of the products of the tendered rates and the quantities for which order are placed) bears to the total cost of the same items and quantities all the BHEL schedule of rates.

The selection of analogous items or analogous group of items referred to above shall be done by the Engineer-in-charge. Where the rates for deviated items or new items of work can be derived by the selection of different analogous items or analogous group of items, the lowest of all such derived rates shall be taken as the correct rate.

In the case of the contracts for which the Engineer-in-charge is the Accepting officer all disputes regarding the settlement of rates of deviated or new items or work shall be referred to the Head of Civil Engineering Department whose decision shall be final and conclusive as the case may be.

- II. If any work not covered by any of the foregoing is ordered of the contractor, the basis of payment shall be decided by the Accepting Officer whose decision shall be final and conclusive and binding on the parties.

53. REIMBURSEMENT / REFUND ON VARIATION IN PRICE, MATERIALS

If after submission of the tender and / or during the progress of the works, **the price of any material (not being a material supplied from the BHEL store in accordance with the conditions of the contract) is increased or decreased by an Act of Legislature (central or state) and / or any notification there under or on account of new duties or levies such as Octroi or on account of increase or decrease in such duties affecting the price of materials required for incorporation in the works and made from materials of which the price has increased or decreased as aforesaid and the contractor has thereupon to pay in respect of such material or item, a price which is higher or lower than the price of that material or item as prevailing immediately before the passing of such act or levying, increasing / decreasing of such duty, then BHEL shall increase in price or the duty reimbursed to the contractor the increase in price at additional or increased duty paid by the contractor and in case of decrease in price the BHEL shall be entitled to a refund of the reduction in the price or the reduction in duty. This will be applicable only for material, which are directly incorporated on the work**, the contractor shall however indicate the assumption he has made while submitting the tender. However no reimbursement or refund shall be made if the increase / decrease is not more than + 10% of the said price, and if so the reimbursement or refund shall be made only / on the excess over + 10% provided always that any such increase shall not be payable if, in the opinion of the Accepting officer (whose decision shall be final and conclusive) the increase is attributable to the delay in the execution of the contract with the control of the contractor or that any such increase has become operative after the contracted/ or extended dated of completion of the works or items of work in question.

The Contractor shall, for the purpose of this condition, keep such books of account and other document as are necessary to show the amount of any increase claimed or any reduction available and shall allow inspection of the same by any duly authorized representative of the BHEL and further shall at the request of the Engineer-in-charge furnish for verification such other information as the Engineer-in-charge may require.

The Contractor shall within a reasonable time of his becoming, aware of any alteration in the prices of any such materials give notice thereof in writing to the Engineer-in-charge stating that the rate is submitted in pursuance to this condition together with all information relating thereto which he may be in a position to supply.

54. Advance on account

No payment shall be made for work estimated to cost less than Rupees **ONE THOUSAND** till after the whole of the work shall have been completed and a certificate of completion given by the Competent authority.

In the case of work estimated to cost more than Rupees **FIVE THOUSAND** the contractor may at intervals of not **less than** one month or as otherwise provided for in the Contract documents, counting from the date on which order to commence work is given by Engineer-in-charge submit claims on BHEL forms for payment of **advances** on account of work done and of materials delivered in connection with the Contract.

The Contractor shall be paid in respect of such claims to the extent approved and passed by the Engineer-in-charge subject to a maximum of 90% of the value of the work actually executed to the satisfaction of the Engineer-in-charge. The certificate of the Engineer-in-charge regarding such approval and passing of the sums so payable shall be final and conclusive against the contractor.

Notes:

"After the full amount of Security Deposit is made up through the 10% deduction from On account bills, 100% payment of all subsequent bills may be made to the contractor.

The Contractor may also be paid during **the progress of the work 75% of the value of any materials which are in the opinion of the Engineer-in-charge in accordance with the Contract, and are actually required for incorporation in the work and which have reasonably been brought to the site in connection there with and are adequately stored and or protected against damage by weather or other, causes, but which have not at the time of payment of the advance been incorporated the work on furnishing a formal hypothecation deed.** Payment of such advances, however shall be purely at the discretion of the Accepting Officer provided always that payment shall not be made under these periodical certificate in respect of perishable materials like lime, cement, timer, sand, kankar, etc.

Any sums, due from the Contractor on account of Tools and Plant, stores or any other items provided by BHEL shall be deducted from the respective advances. The Engineer-in-charge shall from time to time certify the sums payable to the Contractor after retaining the reserves.

Any certificate relating to work done or materials delivered may be modified or corrected by any subsequent interim certificate or by the final certificate of the Engineer-in-charge supporting an advance payment shall itself be conclusive evidence that any work or materials it relates are in accordance with the contract. All such intermediate payments shall be regarded as advance against the final payment only and shall not be considered an admission of the performance of the contract or any part thereof in any respect or the accruing of any claim whatsoever.

Such intermediate payment shall not conclude, determine or affect in any way the powers of the Engineer-in-charge as to the final settlement and adjustment of the account or otherwise or in any way vary or affect the contract.

55. Final Bill

As soon as possible after the completion of the work to the satisfaction of the Engineer-in-charge, the contractor shall forward a certified final account on BHEL forms, in duplicate.

It shall be accompanied by all abstracts, vouchers, etc, in support thereof and shall be prepared in the manner prescribed by the Engineer-in-charge.

No claims will be entertained after the receipt of the final bill.

The Final bill is to be submitted within 90 days of completion of work or within the time period extended by the Officer –In-Charge. No claim of any nature will be entertained thereafter.

The Contractor shall be entitled to be paid the final sum less the value of payments already made on account, subject to certification of the final bill by the Engineer-in-charge. Any sums due from the Contractor on account of Tool and Plant, Stores or any other items provided by BHEL not yet recovered from the contractor shall be deducted from the final sum aforesaid.

No charge shall be allowed to the Contractor on account of the preparation of the final bill.

56. Payment of Bills

All payment to be made to the Contractor under this contract shall be made within fifteen days of submission of all documents and after the certification by the Engineer-in-charge through e mode only. For this purpose the contractor has to submit duly filled in Authorisation form(as prescribed by THE Company) and as certified by their Bankers.

57. Recovery from Contractor

Whenever under the contract any sum of money shall be recovered from or payable by the Contractor the same may be deducted any sum than due or which at any time thereafter may become due to the Contractor under the contract or under any other contract with BHEL or from his Security Deposit or he shall pay the claim on demand.

58. Post Technical Audit of work and Bills

BHEL reserve the right to carry out a post-payment audit and technical examination of the work and final bill including all supporting vouchers, abstracts etc., and to enforce recovery of any sums becoming due as a result thereof in the manner provided in the preceding sub-paragraphs provided. However, no such recovery shall be enforced after three years of passing the final bill.

59. DELETED

60. 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 whatever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works, or the execution 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 Executive Director/Group General Manager of BHEL and if the Executive Director/Group General Manager, willing to act as such Arbitrator. There will be no objection if the arbitrator so appointed is an employee of BHEL-Ranipet or an employee of any other unit 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 Arbitration to whom the matter is originally referred being transferred or vacating his office or being unable to act for any reason, such Executive Director/Group General Manager as aforesaid at the time of such transfer, vacation of office or inability to act, shall appoint another person to act as 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. It is also a term of this contract that no person other than a person appointed by such Executive Director/Group General Manager or an employee appointed as Arbitrator as aforesaid should act as Arbitrator and the Arbitrator shall give reasons for the award.

Subject as aforesaid the provision of the Arbitration Act, 1940 or any statutory modification or re-enactment 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 invoking arbitration shall specify the dispute or disputes to be referred to arbitration under this clause, together with the amount or amounts claimed in respect of each such dispute.

The arbitrator(s) may from time to time with consent of the parties extend the time, for making and publishing the award.

The work under the contract shall, if reasonably possible, continue during the arbitration proceedings and no payment due or payable to the contractor shall be withheld on account of such proceedings.

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 the first hearing.

The arbitrator shall give a separate speaking 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 contract.

61, Jurisdiction of Court

For the purpose of Court proceeding if any, same shall be in the Court having jurisdiction over Ranipet - 632 406. (Vellore District, Tamilnadu).

62 Deleted

63 HEALTH, SAFETY & ENVIRONMENT POLICY

The management is committed to be an environmentally sound company in its activities, products, services and to provide safe and healthy working environment covering its employees, products & services as an integral part of business performance through:

- Compliance with applicable Legislation and Regulations.
- Setting objectives and targets to eliminate/control/minimize environmental pollution, risks due to Occupational Health and Safety Hazards.
- Promotion of activities for conservation of resources by environmental management with focus on oil, electrical energy and chemicals,
- Enhancement of Environmental, Safety and Occupational Health awareness amongst employees, customers, suppliers, contractors by pro-active communication.
- Regular evaluation and pro-active measures for prevention & control environmental pollution/accidents/occupational diseases.
- Appropriate training of employees and interested parties on Health, Safety & Environmental (HSE) aspects.
- Formulation and maintenance of HSE Management Programs for continual improvement.
- Periodic review & audit of HSE Management System to ensure its continuing suitability, adequacy and effectiveness.
- Communication of HSE Policy to all employees and interested parties.
- Co-operation with concerned agencies/regulatory bodies engaged in HSE activities.

ANNEXURE-1

TERMS AND CONDITIONS REGARDING COMPLIANCE WITH VARIOUS LABOUR LAWS BY THE CONTRACTORS FOR BHEL

(Please See Condition – 22)

1. The Contractor shall not employ in connection with the work any person who has not completed 18 years of age.
2. The Contractor shall in respect of labour employed by him either directly or through sub-contractor's comply with or cause to be complied with the following statutory provisions and rules and in regard to all matters provided therein.
 - a) The Contract Labour (Regulation & Abolition) Act 1970 and the related Tamilnadu rules.
 - b) The Minimum wages Act 1948 and the related Tamilnadu Rules
 - c) The payment of wages Act 1936 and the related Tamilnadu Rules
 - d) The factories Act 1948 and the related Tamilnadu Rules
 - e) The Employee's Provident Fund & Miscellaneous Provisions Act 1952.
 - f) The Employees State Insurance Act 1948.
 - g) The workman's Compensation Act 1923.

[BACK](#)

h) The Industrial Disputes Act 1947 and any other Law or modifications to the above or to the rules made there under from time to time-

i) Pay met of Bonus Act 1965.

REGISTRATION AND LICENSING

3. Every Contractor shall register his name with the Welfare Section of BHEL before taking up the work award to him by giving the following information and getting a code Number
 - a) The Name of the Contractor.
 - b) Nature of Contract Work.
 - c) Period of Work.
 - d) Number of maximum labour employed by him on anyone day
 - e) License No. & Date (applicable in case of Contractors employing 20 or more workers)
 - f) Whether enrolled for PF, ESI, etc., and enrolment No.

This Information is called for the purpose of informing the Inspectorate of Factories whenever they call for information regarding Contracts,

4. The Contractor employing 20 or more workmen is required to obtain license from the authorities (The Deputy Chief Inspector of Factories / Assistant Commissioner of Labour as the case may be). This license shall be amended and /or renewed wherever there is an increase in the workmen employed by him or in the event of contract being extended or renewed. The Contractor shall inform the license number to the BHEL Management before taking up the work.
5. The Contractor (licensed or unlicensed) shall promptly furnish every information and document required by BHEL authorities for the purpose of fulfilling their obligations as principal Employer and / or occupier of the factory and shall render all necessary assistance for the same.

WAGES

6. The Contractor shall pay wages to the workmen employed by him at the rate which shall not be less than the minimum wages applicable under Law from time to time.
7. The Contractor shall fix wage periods in respect of which wages shall be payable. No wage period shall exceed one month.
8. The Contractor shall ensure payment of wages to the Contract labour employed by him within three days from the end of wage period in case the wage period, is one week or a fortnight and in all other cases before 10th day of the following month.

9. All payment of wages shall be made on working days at the work site and during the working time and on dates notified in advance. In case the work is completed before the expiry of the wage period, final payment shall be made within 48 hours of the last working day.
10. Where the employment of any works is terminated by or on behalf of the Contractor, the wages earned by him shall be paid before the expiry of the second working day from the day on which his employment is terminated.
11. Wages due to every worker shall be paid to him direct or to the person authorities by him in this behalf. All wages shall be paid in current coin or currency or in both.
12. The Contractor shall ensure the disbursement of wages in the presence of such authorized representatives of BHEL Management.
13. The above payment shall be verified by the authorized Officers/representative of BHEL with the following certificates on the payment sheet Certified that the amount shown in Column No has been paid to the workmen concerned in my presence on at A certificate of payment shall be furnished in duplicate by the Contractor to the Engineer-in-charge each month in Form "A"
14. A Notice of showing the wage period and the place and time of disbursement of wages shall be displayed at the place of work and a copy to be sent to the welfare department by the Contractor under acknowledgement.
15. Notices showing the rates of wages, weekly rest days, wage period, hours of work, date of payment of wages, and addressed to the Inspectors having jurisdiction the date of unpaid wages shall be displayed in Tamil and English in conspicuous places at the establishment and at worksite the contractor.
The contractor shall inform the BHEL Management every month the details of contract labour engaged for each contract in the following form :-
 - a) Serial Number
 - b) Location
 - c) Period of Work
 - d) No. of Contract labour engaged during the work
 - e) No. of days worked
 - f) Mo. of Man days worked
 - g) Wages paid to his workers

The above statement shall be furnished to BHEL Management at the end of every month,

REGISTERS AND RECORDS AND COLLECTION OF STATISTICS

16. The following documents/formats under contract labour {Regulation and Abolition) Act 1970 and Tamil Nadu Rules there under shall be maintained by each Contractor,
 - a) Register of Persons employed by the Contractor
 - b) Employment Card
 - c) Service Certificate
 - d) Muster Roll, Wage Register, Deduction Register, Wage Slip, Over Time Register, Register of Fines. Register of Advances etc.
18. The Contractor shall display the abstract of the contract labour (Regulation and Abolition) Act and the Rules there under both in English and in Tamil.
19. Half Yearly Return shall be sent by the Contractor in duplicate to the Licensing Officer.
20. The Contractor shall submit the returns required under the Contract Labour (Regulation and Abolition) Act 1970 periodically to BHEL Management
21. The Contractor shall without fail give up to date information in writing of the attendance of the workers employed by him.
22. The Contractor shall ensure that his workers keep and produce the Employment Card when coming to duty and take them back when leaving duty.
23. All the above registers and records shall be preserved in original for a period of Three years. All the Registers, Records and notices maintained under the Act and rules shall be produced on demand by Inspector or any authority under the Act,

WORKING HOURS AND WORKING CONDITIONS

24. NO WORKER SHALL BE REQUIRED OR ALLOWED TO WORK ON SUNDAY UNLESS HE HAS OR WILL HAVE A HOLIDAY ON ANYONE OF THE THREE DAYS BEFORE OR AFTER THE SAID DAY
25. The contractor shall inform BHEL Management in the prescribed form details of the contract workers scheduled to work on Sunday, the day of rest and also indicate the substituted holiday in lieu thereof. This shall be intimated two days in advance before his workmen are booked for work on Sunday
26. The contract labour working for more than nine hours in any day or for more than 48 hours in any week shall be paid wages at the rate of twice the ordinary rates of wages in accordance with the provisions of section 59 of the Factories Act 1948
27. The contractor shall provide all safety devices and personal protective equipment to his workmen at his own cost and shall ensure that his workmen wear/use such devices or equipment provided to them while doing the work and there should not be any relaxation on this.
28. The contractor shall give four paid National Holidays to his workers, viz, 26th January, 1st May, 15th August and 2nd October.

29. The contractor shall ensure that his workmen vacate the premises after the shift is over.
30. No woman worker shall be required or allowed to work in the factory except between the hours of 6.00 am and 7.00 pm.
31. The contractor shall comply within the provisions relating to welfare and Health facilities as provided in the contract labour (Regulation and Abolition) Act 1970 read with the Tamil Nadu contract labour Rules 1975,

NOTICES OF ACCIDENTS

32. Notwithstanding any thing contrary to this, in the event of accident the contractor shall be required to fill injury report and submit the Engineer-in-charge immediately and ensure the compliance of ESI/Workmen's Compensation Act, Factories Act and Rules made there under. He shall also maintain a register of accident as per Act.
33. The contractor shall get the contract labour engaged by him insured under workmen's Compensation Policy from General Insurance Corporation of India before actually starting the work of contract. The Insurance coverage should be for the entire period of contract. The contractor shall comply with the provision of the Workmen's Compensation Act 1923 [This should be read in conjunction with the provision of ESI Act]
34. The contractor shall ensure that all his workmen are covered under the Employees State Insurance Act and produce to BHEL such Registration Number/ Enrolment Number before executing the contract work.
35. The contractor shall regularly pay the amount of contribution i.e. employers contribution as well as employees contribution in pursuance of the above scheme as fixed from time to time The contribution payable presently is 1.75% of wages to be recover from the workmen and 4.75% of wages to be contributed by the contractor. Contribution recovered from employee and contribution made by the contractor may be rounded to the next higher multiples of five parse
36. The contractor shall take note of any amendment that may be brought forth in the above contribution rate and accordingly.
37. The contractor shall ensure that his workmen are covered under the EPF & miscellaneous Provision Act 1952, and accordingly produce to the BHEL Management the registration / enrolment number before awarding at contract work. As per the existing provision every worker who has completed three months continuous service or has actually worked for not less than 60 days within a period of three months or less shall be entitled and required to become a member of the fund. The employees, contribution payable at present is 12% of wage which will be recovered by the contractor from the wages of his workmen and the contractor should pay equal contribution The contractor is also liable to pay any administrative charges in this behalf that may be decided from time to time, it will be the responsibility of the contractor to ensure such contribution payable in respect of workmen employed through sub-contractors also.

38. The contractor shall take note of any amendment in the rate of contribution payable under the scheme from time to time.
39. The contractor shall within seven days of the close of every month submit to BHEL a statement showing the amount to contribution payable/paid for employees engaged by him or through him and shall also furnish to BHEL such information as Principal Employer is required to furnish under the provision of the ESI Act and PF as well as the schemes made there under to the authorities concerned.
40. Whenever any sum of shall sum of money is found to be recoverable from or payable by the contractor under the above Acts the same shall be deducted from any sum that may be due or which at any time there after may become due to the contractor under this contract or under any other contract or from his security deposit in case the recoveries are not sufficient to satisfy the claims, the contractor shall pay the balance there of on demand. In case any recoveries are made this clause from the as may be required to replace the shortage caused by such recoveries in the amount of Security Deposit.
41. The contractor shall abide by all the labour and other laws applicable to contractor labour/workmen under this contraband shall at all times Keep BHEL indemnified against- all losses, claims, prosecutions under any law.
42. in case of non compliance of any of the provisions of the Acts and in case BHEL Having complied with the same BHEL wilf be entitled to recover the same from the contractor 1 sub contractor.
43. Non exercise of any of the power of or rights available to BHEL here under or under any Jaw, shall not any way operate as waiver thereof.

FORM - IV

(See Rule 21 (1) of Tamil Nadu Contract Labour Rules)

Application for License

1. Name and Address of the Contractor (including his Father's Name in case of Individuals)
2. Date of Birth and age {in case of Individuals)
03. Particulars of Establishment where Contract Labour is to be employed
 - a) Name and Address of the Establishment
 - b) Type of business .trade industry manufacture
 - c) Number and date of certificate of Registration of occupation, which is carried on the Establishment under the Act.
 - d) Name and address of the Principal Employer
4. Particulars of contract labour :
 - a) Nature of work in which contract labour is employed or is to be employed in the establishment
 - b) Duration of the proposed contract work (give particulars of proposed date of commencing and ending)
 - c) Name and address of the agent or Manager of contractor at the worksite
 - d) Maximum No. of contract labour proposed to be employed in the establishment on any date
- 5 Whether the contractor was convicted of any offence within the proceeding rive years, jf so give details :

6. Whether there was any order against the contractor revoking or suspending license or forfeiting security deposit in respect of an earlier contract if so the date of such order:

7. Whether the contractor has worked in any other establishment within the past five years, if so, give details of the principal employer Establishment and nature of work:

8. whether a certificate by the principal Employer in form V is enclosed
:

9. Amount of license fee paid No of Treasury challan and Date :

- 10 Particulars of security deposit if any, requested to be adjusted, including Treasury Receipt number :

11. The amount of security deposit or balance if any after adjustment of amount to be refunded under rule 31 deposited with treasury Receipt Number and date :

DECLARATION

I hereby declare that the details above are correct to the best of my knowledge and belief.

PLACE :
DATED :

SIGNATURE OF THE APPLICANT
[CONTRACTOR]

NOTE : The application should be accompanied by a treasury Receipt for the appropriate amount and a certificate in Form V From the principal employer.

(To be filled in the office of the Licensing officer) Date of receipt of the application with challan for fees / security Deposit.

SIGNATURE OF THE LICENSING OFFICER CONTRACTOR

FORM-XIII

See Rule 75 of Tamil Nadu Contract Labour Rules 1975}

Register of workman employed by contractor

Name and Address of the Contractor :

Name and location of work :

Name and address of establishment in, /under
which contract is carried on

Name and address of Principal Employer

1. Serial Number
2. Name and surname of workman
3. Age and sex
4. Father's / Husband's Name
5. Nature of Employment /Designation
06. Permanent Home address of workman
(village Taluk and District)
7. Local Address :
8. Dale of commencement of Employment :
9. Signature or Thump Impression of workman
10. Date of termination of Employment :

FORM - XIV

(See Rule 76 of Tamil Nadu Contract Labour Rules)

EMPLOYMENT CARD

Name and Address of contractor : Name and address of Establishment in/under which contract is carried on _____

Mature of work and location of work : Name and address of Principal Employer

1. Name of the workmen
2. Sl. No. of register of workmen employed
3. Name of Employment / Designation
04. Wage rate (with particulars of unit in case of Piece work) :
5. Wage period
6. Tenure of Employment
7. Remarks

SIGNATURE OF CONTRACTOR

Tenderer/Contractor

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Accepting Officer

FORM - XV

Rule 77 of Tamil Nadu Contract Labour Rules}

SERVICE CERTIFICATE

Name and Address of the contractor

Name and address of
Establishment in/under
which contract is carried on__

Name and location of the work

Name and address of the workman

Name and address of Principal
Employer

Tenderer/Contractor

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Accepting Officer

Age or Date of Birth

Identification

marks Father's /

Husband's Name

Sl.No	Total period for which employed		Nature of work done	Rate of wage (with particulars units in case of piece of work)		Remarks
	From	To		(4)	(5)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)

SIGNATURE

FORM - XVI

(See Rule 78 of Tamil Nadu Contract Labour

Rules) MUSTER ROLL

Name and Address of contractor
of

: Name and address

Establishment
in/under which
contract is carried
on _____

Nature of location of the work
of

: Name and address

Principal Employer____

For the Month of

SI. No	Name of workmen	Father's/Husbands Name	Sex	Dates					Remarks	
				1	2	3	4	5		
(01)	(02)	(03)	(04)	(05)	(06)					

SIGNATURE OF CONTRACTOR

Tenderer/Contractor

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Accepting Officer

FORM - XVII

(See Rule 78(1) (a) (i) of Tamil Nadu Contract Labour Rules)

Register of wages

Name and Address of the Contractor :

Nature and location of work :

Name and address of establishment in/under
which contractor is carried on :

Name and address of Principal Employer :

Wage Period : MONTHLY

1. Serial Number :

2. Name of workman :

3. SL No. in Register of workman :

4. Designation / Nature of work done :

5. No, of days worked :

06 Units work done :

07. Daily rate of wages / Piece rate ;

6. Basic wages :

9. Dearness allowance :

10. Overtime :

11. Other cash Payment
(Nature of payment to be indicated) :

12. Total :

13. Deductions, If any [indicate nature] :

14. Net amount paid :

15. Signature / Thump impression of workman :

16. Initials of contractor or his representative :

CONTRACTOR

Tenderer/Contractor

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Accepting Officer

FORM - XIX

(See Rule 78(1) (b) of Tamil Nadu Contract Labour (Rules)

Wage Slip

Name and Address of the Contractor

Name and Father's /
Husband Name of the
workman _____

Name and location of work

For the week / Fortnight /
Month ending

01. No of days worked

02- No. of units worked in case of
piece rate workers

03. Rate of daily wages /piece rate

04. Amount of over time wages

05, Gross wages Payable

06, Deductions, if any

07. Net amount of wages paid

**INITIALS OF THE CONTRACTOR OR
HIS REPRESENTATIVE**

FORM - XX

(See Rule 78(1) (a) (i) of Tamil Nadu Contract Labour Rules)

Register of deductions to damage

Name and Address of the Contractor :

Mature and location of work ;

Name and address of establishment in/under
which contractor is carried on :

Name and address of Principal Employer :

1. Serial Number ;

2. Name of workman ;

3. Father¹'s/Husband's Name ;

4. Designation / Nature of employment ;

5. Particular of damage or loss ;

0B- Date of damage or loss ;

07. Whether workman showed cause
against deduction ;

8. Name of person in which presence
employee's explanation was heard ;

9. Amount of deduction imposed ;

Date of Recovery

10. No. of installments imposed ;

11. First Installments ;

12. Final Installments. ;

13. Remarks ;

Tenderer/Contractor

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Accepting Officer

FORM-XXI

(See Rule 78(1) (a) (ii) of Tami Nadu Contract Labour Rules)

Register of Fines

Name and Address of the Contractor

Nature and location of work

Name and address of establishment in/under
which contractor is carried on

Name and address of Principal Employer

1. Serial Number
2. Name of workman
3. Father's / Husband's Name
4. Designation / Nature of employment'
5. Act / Omission for which fine imposed
- 06 Date of offence
07. Whether workman showed cause against
fine
03. Name of the person in whose presence
employee's explanation was heard
9. Wage period & Wage payable
10. Amount off me imposed
11. Date on which fine realized
- 12 Remarks

FORM - XXII

(See Rule 78 (1) (a) (ii) of Tamil Nadu Contract Labour Rules)

Register of Advance

Name and Address of the Contractor ;

Nature and location of work :

Name and address of establishment in/under
which contractor is carried on :

Name and address of Principal Employer :

1. Serial Number :

2. Name of workman :

3. Father's / Husband's Name :

4. Designation / Nature of employment :

5. Wage period and wages payable :

6. Date and amount of advance given :

7. Purposes (s) for which advance made :

08 No, of installments by which advance to
be repaid

9. Date and amount of each installment repaid :

10. Date on which installment was repaid :

11. Remarks :

FORM-XXIII

(See Rule 78(1) (a) (iii) of Tamil Nadu Contract Labour Rules)

Register of Overtime

Name and Address of the Contractor :

Nature and location of work :

Name and address of establishment in/under
which contractor is carried on :

Name and address of Principal Employer :

1. Serial Number :

2. Name of workman :

03 Father's / Husband's Name :

4. Sex :

5. Designation / Nature of employment :

6. Dates on which overtime worked ;

07. Total overtime worked or production in
case of piece -rated

8. Normal rate of wages

9. Overtime rate of wages

10. Overtime earning

11. Date on which Overtime wages paid

12. Remarks

Tenderer/Contractor

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Accepting Officer

PAYMENT CERTIFICATE

FORM "A"

Certified that :

1. I as contractor of
have made payment to all contract Labourers in full in respect of contract
No as per terms of my contract
and in no case less than the rates applicable up to the period ending.
2. *The* above payment have been made by me in the presence of the
authorized representative of
offor..... :.....
Employees amounting to Rs
3. The necessary payment registers attendance register / Form A?. . Leave
register/ book under Labour and industrial Law and other relevant
have been maintained by me and available with ma for production -an :
when required .
4. No payment is due / outstanding to any contract Labourers engaged by
me in respect of the aforesaid contract up to the period ending

CONTRACTOR

NAME
DATE

SUPERVISOR

NAME
DESIGN
DATE

COUNTERSIGNED
OFFICER INCHARGE

NAME
DESIGN
DEPT.

ANNEXURE II
SAFETY RULES
(See Condition 2)

A BHEL SAFETY CODE

A

1. Suitable scaffolds shall be provided for workmen for all work that can not safely be done from the ground, or from solid construction except such short period of work as can be done safely from ladder. When a ladder is used an extra mazdoor shall be Engaged for holding the ladder and if the ladder is used for carrying metals as well suitable footholds and handholds shall be provided on the ladder and the ladder shall be give an inclination not steeper than Vito 1(1/a horizontal and 1 vertical)
2. Scaffolding or staging more than 3.25 metres above the ground or floor swing or suspended from an overhead support or erected with stationary support, shall have a guard rail properly attached. bolted braced and otherwise secured at least 1 metre high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends there of with only such opening as may be necessary for the delivery of materials , Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
3. Working platform, gangways and stairways shall be so constructed that they do not sag unduly or unequally , and it height of a platform or gangway or stairway is more than 3.25 metres above ground level or floor level it shall be closely boarded have adequate width and be suitably fenced, as described in 2 above.
4. Every opening In floor of a building or in a working platform shall be provided with suitable means to prevent falling of persons or materials by providing suitable fencing or railing with a minimum height of 1 metre
5. Safe means of access shall be provided to all working platform and other working places. Every ladder shall be securely fixed, no portable single ladder shall be over 9 metres in length. Width between side rails in a rung ladder shall in no case be less than 30 cm for ladders up to and including 3 metres in length, For longer ladder this width-shall be increased by at least 6mm for each additional 30cm of length. Uniform step spacing shall not exceed 30cm,

Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and light to protect public from the accident and shall be bound to bear expenses of defiance of every suit-action or other proceeding at law that may be brought by any person for injury sustained owing to neglect of the above precautions, and pay any damages and cost which may be awarded in any such suit, action or proceeding to any such person or which may with the consent of the contractor be paid to compromise any claim by such person.

6 Excavation and Trenching

All trenches 1.5 metres or more in depth, shall at all time be supplied with at least one ladder for each 30m length or fraction there of ladder shall be extended from bottom of trench to at least 1 metre above surface of the ground . Sides of the trench 1.5 metres or more in depth shall be stepped back to give suitable slope or securely held by timber bracing. so as to avoid the danger of sides collapsing. Excavated materials shall not be placed within 1.5 metres of the edge of trench or half the depth of trench, whichever is more. Cutting shall be from top to bottom under no circumstances shall under mining or under - cutting be done.

7. Demolition:

Before any demolition work is commenced and also during the progress of work.

- a] All roads and open areas adjacent to the work site shall be closed or suitably protected.
 - b] No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus, used by the operator shall remain electrically charged.
 - c] All practical steps shall be taken to prevent danger to person employed from the risk of fire or explosion , or flooding no floor, or roof or other part of building shall Lie so overloaded with debris or materials as to render it unsafe.
8. All necessary personal safety equipment as considered adequate by the Engineer-in-charge shall be /available for use of person employed on the site and maintained in a condition suitable for immediate use and the contractor shall take adequate steps to ensure proper use of equipment by those concerned.
- a] Workers employed on mixing asphaltic materials cement and lime mortars concrete shall be provided with protective foot ware and protective gloves.
 - b] Those engaged in handling any material which is injurious to the eye shall be provided with protective goggles.
 - c] Those engaged in welding work shall be provided with welder's protective eye shields
 - d] Stone breaker shall be protective goggles and protective clothing and seated at sufficiently safe intervals.
 - e] When workers are employed in sewers and manholes which are in use, the contractor shall ensure that manhole covers are opened and manholes are verified at least for an hour before the workers are allowed to get into them manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to public.
 - i] No paint containing lead or lead products shall be except in the form of paste or ready-made paint.
 - ii] Suitable face masks shall be supplied for use by workers when paint applied in the form of spray or surface having lead paint is dry rubbed-and scrapped.

f) The contractor shall not employ men below the age of 18 and women on the work of painting with products containing lead in any form. Whenever men above the age of 13 are employed on the work of lead painting- the following precaution shall be taken:

i) No paint containing lead or lead products shall be used except in the form of paste or ready-made paint.

ii) Suitable face masks shall be supplied for use by workers when paint is applied in the form of spray or surface having lead paint is dry rubbed and scraped

iii) Overalls shall be supplied by the contractor to workmen and adequate facilities shall be provided to enable working painters to wash during or cessation of work,

&. When work is done near any place where there is risk of falling, all necessary equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

10. Use of hoisting machine and tackles including their attachments, anchorage and supports shall conform to the following

a)

i) These shall be of good mechanical construction, sound materials and adequate strength and free from defects and shall be kept in good working order,

ii) Every rope used in hoisting or lowering or any other ring materials or as a means of suspension shall be of durable quality and adequate strength and free from defects,

b) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 yrs shall be in charge of any hoisting machine including any scaffolding winch or give signals to operator.

c) In case of every hoisting machine and or every chain ring, hook, shackle swivel and pulley block used in hoisting or lowering as means of suspension safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall have the safe working load plainly marked there on. In case of a hoisting machine having a variable safe working load each safe working load at the condition under which it is applicable shall be clearly indicated. No part of any machine or gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

d) In case of department machine, safe working load shall be notified, by the Engineer-in-charge. As regards contractor's machine the contractor shall notify safe working load of each machine to the Engineer-in-charge when ever he brings it to site of work and get it verified by the Engineer-in-charge.

11. Motors, gearing, transmission electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards, hoisting appliances shall be provided with such means as will reduce to the minimum risk of accident descent of load. Adequate precaution shall be taken to reduce to the minimum risk of any part of a suspended load becoming-accidentally displaced. When workers are employed on electrical installations which are already energised insulating mats, working apparel such as gloves, sleeves and boots as may be necessary shall be provided. Workers shall not wear any rings watches .carry keys or other materials which are good conductors of electricity.
12. All scaffolds, ladders and other safety devices mentioned or described here in shall be maintained in a safe condition and no scaffold, ladder or equipment shall be altered or removed while it is use. Adequate washing facilities shall be provided at or near the places of work.
13. These safety provision shall be brought to the notice of all concerned by display on a notice board at a prominent place at the work spot persons responsible for immuring compliance with the safety code shall be named thereon by the contractor.
14. To ensure effective enforcement *oi* the rules and regulations relating to safety precaution, arrangement made by the contractor shall be open to inspection be the Engineer-in-charge or his representation and the inspecting officers as defined in the contractor's Labour Regulations.
15. Not withstanding the above conditions 1 to 14, th contractor is not exempted from the operation of any other Act or Rule in force.

B. GENERAL SAFETY PRECAUTIONS TO BE FOLLOWED AT WORK SITES DURING EXECUTION

The following safety measures should be strictly adhered to during execution of works at sites:

1. Providing the working platform with toe-board and handrail for continuous working at heights.
2. Providing safety belt and lifeline at all times for men working at heights.
3. Providing dust or fume respirator in places where dust and fume concentration exists.
4. Providing goggles and welding screens.
5. Providing acid and alkali proof rubber gloves for handling acids, alkali and chemicals, which are corrosive.
6. Providing rubber gloves for working on electrical works.
7. Ensuring proper lashing of the components while being transported in vehicles,
8. The vehicles must have side supports or have body to support the materials conveyed.
9. The materials should not be allowed to extend or overflow the sides of vehicles.
10. Materials should not be allowed to overhang from the rear edge of the body of the vehicle.
11. Driver of the vehicle must possess license.
12. Vehicle must not be overloaded prescribed limits.
13. Red flags and lights for parts projecting from the body of the vehicle must be provided.
14. The speed restrictions within the factory must be strictly adhered to,
15. The gas cylinders must always be handled on trolleys or kept tied down not in use. They should never be rolled as rollers for conveying,
16. Cylinders should not be used without regulators.
17. All excavations may be barricaded and red belts/ lamps must be provided. All electrical connections must be properly earthed.
18. No work should be taken up for execution inside shop floor, without obtaining necessary work permit.
19. Providing helmet for high level work.
20. The contractor should maintain EI register regarding the driver license particulars.
21. All Personnel Protective Equipment (PPE) must conform to standard specification as per the

22. Details given in the code of conduct,
- (i) Safety helmets conforming to IS-2925: 1984
 - (ii) Safety Belts conforming to IS-3521: 1983
 - (iii) Safety Shoes conforming to IS-19S9: 1978
 - (iv) Eye and face protection devices conforming to IS - 8520:1977 & IS - 8940:1978
 - (vi) Hand and body protective devices conforming to: IS - 2573: 1975
IS - 6994: 1973 IS-8807: 1973 IS - 8519: 1977

Contractor including the subcontractors, agents and labours engaged on work are required to scrupulously adhere to the safety regulations, safety precautions and measures. Any violation thereof will invite punitive action being taken against them. Also contractors with frequent violations of safety regulations will not be entrusted with further work in this organization.

General:

All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, safety nets, ladders, equipment etc, used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained, before putting them to use and from time to time as instructed by authorized BHEL official who shall have the right to ban the use of any item.

C. SAFETY PRECAUTION TO BE OBSERVED WHILE TRANSFORATING MATERIALS

I. Vehicle

1. Vehicle carrying materials should have proper registration documents and must be produced on demand by our Security staff.
2. The light on right side i.e. over the driver's cabin shall be in working condition
3. Both the head light as well as park lamps must be in working condition.

II. Movement of Vehicle

1. The vehicle should not travel a! more than 20KMPH in our premises
2. The driver of the vehicle must possess heavy duty license and produce on demand by the Security Staff.
3. Vehicles carrying inflammable liquids in the tanks containers should have grounding chain or the tank container should be coated with insulating materials to avoid static electricity
4. In road junction, speed breaker and Railway crossing the speed should be lowered and vehicles should proceed cautiously.
5. **The** driving should be 'keep to the left' at all places.
6. The vehicles should not parked on the road which could obstruct the vehicular traffic.
7. No person other than driver should be allowed to sit or stand on the prime mover or trailer.
8. The vehicle should pass only through the approved routes. Short cuts should be forbidden.
9. There must be a safe distance behind another moving truck.
10. The driver should avoid making quick starts, jerk stop or quick turns at excessive speed.

III Shipping

1. Strong side supports should be provided on both sides of the trailer. The side supports should be fixed in such a way that it cannot be removed even temporarily.
2. Adequate packing must be given for easy slinging operations. The packing materials should be good enough to withstand the load.
3. The stacking of loads on the truck should be evenly placed, This load should not be heaped together or dumped over the chassis.
4. The load on the truck should not be beyond its standard capacity. The carrying capacity must be clearly marked on the trailers also.
5. The loaded materials should be fastened tightly with "WIRE ROPE ". Manila rope or coir rope should not at all be used. There must be side packing such as gunny or rubber tyre between the sharp edges of the job and wire rope in order to avoid cut in the wire rope.
6. There must be minimum two fastening and it should be more in case of lengthier loads.
7. The wire rope should be in sound condition i.e. , there Should not be Links, knots or bristles etc.
8. The wire rope ends should be clamped with 'U' clamps.
9. The loose pieces should be bundled before loading on the truck.
10. There must be red flags or red lamps for the lengthily loads which extend beyond chassis.
11. The materials should not be stacked too high to avoid hitting against live electric lines.
12. The load should not be overhanging more than 0.9 metres from the end of body.
13. While transporting the scraps, there must be wire net cover to prevent falling of scrap.

IV General

- 1, The vehicles should not be moved directly inside the production building in case the materials are to be unloaded there But the vehicles should be parked outside the building and the driver should ascertain the passage as well as the unloading points, with the help of¹ the shop officials. This will avoid the congestion of blocking of traffic in the gangway,



Ranipet

SECTION I

TECHNICAL SPECIFICATION CIVIL & CENTRAL SUPERVISION

GENERAL AND SPECIAL SPECIFICATIONS

1. Site Clearance

All the area upon which the construction is to be carried out and areas which are required by the Contractor for his construction facilities are to be cleared off all rubbish and objectionable matter at Contractor's own cost. Trees, if any, shall not be uprooted or cut without the prior approval of the Engineer-in-charge. All spoils, unserviceable materials and rubbish shall be burnt or removed from site. Usable materials, saleable timber, fire-wood etc., shall be stocked properly at work site in the manner as directed by the Engineer-in-charge. The cost of clearing the areas shall be deemed to have been included by the tenderer in his general rate.

2. Earthwork for Foundations

Earthwork excavation for foundations and filling in foundations shall conform to TNBP 23 and 24. The area to be excavated or filled in with excavated materials shall be clearly demarcated in the field by the Contractor. Excavation shall be done to lines and levels defined. Excavation shall be carried out to such widths, lengths, depths, profiles and grades as shown in the drawing or as may be specified by the Engineer – in – charge. Rough Excavation may be carried out up to a depth 15 cm less than the final level but the balance shall be excavated to precise level with special care. All soft pockets of soil met with even below the final level shall be removed and the excavation filled up as directed by Engineer-in-charge. The methods of excavation shall in every case be subject to the approval of the Engineer-in-charge and the contractor shall ensure the safety and stability of the excavations, being executed by him as well adjacent buildings, structures, services and other works in the vicinity of the site of work. Wherever necessary Engineer-in-charge may direct that the sides of the excavation should be timbered and shored at the contractor's own cost, adopting a proper method approved by the Engineer-in-charge. Notwithstanding the above, should any slip occur, the contractor shall remove all the slipped materials from the excavated pit, at his own cost. He shall also make good at his own all damages caused to the work as well as adjacent buildings, structures etc., as a result of the slip, referred to.

All excavation work shall be subject to inspection and approved by the Engineer-in-charge before any further works in the excavated areas allowed to commence. Should any excavation be carried out beyond the specified depth, the contractor should fill it up at his own cost with the same type and class of material as it is proposed to be laid over the excavated portion. No payment will however be made to the contractor on his account.

The contractor shall ensure that the excavations and the structures under construction are kept free from water logging at all stages of construction. He shall take all necessary precautions and implement measure so that ground water and water from other sources such as under ground streams, aquifers, springs, surface flows etc., are excluded effectively so as to ensure that the works are carried out in a reasonable dry conditions in accordance with the construction schedule. The contractor's quoted rate for excavation shall include charges for such dewatering also.

Back filling around the foundations, trenches, plinth and under the floor shall be done in accordance with TNBP 24 and 25. The finished level of the plinth filling shall be trimmed to the slope required to be given to the finished floor. No separate payment will be made for back filling in foundation with excavated earth as the rate quoted for excavation shall include charges for back filling, watering and consolidation of excavated earth in layers complete as per specifications unless otherwise stipulated in the tender schedule.

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Removal of Hard rock by Blasting

This shall include all rock occurring in large masses which cannot be removed except by blasting. Blasting shall be done in conformity with TNBP 19 & 23 and as instructed by the Engineer-in-charge. When rock blasting has to be done adjacent to structures, the following precautions shall be observed.

- (1) All blasting should be completely muffled to prevent damage by flying pieces.
- (2) Blasting within 3 meters of the structures shall be avoided
- (3) No blasting should be done within 1.5 meters of concrete / masonry structures.
- (4) An isolated boulder extending under the existing structure but projecting within the area of blasting should be blasted.
- (5) The contractor shall be responsible for all damages caused by blasting and shall replace or repair the damaged structures at his own cost.

3. Plain and Reinforced Cement Concrete Works :

All design and construction shall be performed in accordance with the Indian standard code of Practice for plain and reinforced concrete – IS 456 and TNBP 30. Any Special requirements noted on the drawings or bill of quantities shall govern over the provisions of this specifications. Controlled concrete shall be used wherever specified in the schedule of items complying with all requirements of IS : 456 and as per special specifications appended herewith.

The coarse aggregate to be used shall be of hard broken granite stone jelly of various sizes as specified under respective items in the Bill of Quantities, conforming to IS 383 latest edition. The Engineer-in-charge may require the contractor to carryout moisture content tests in both fine and coarse aggregates. For determination of moisture content IS – 2386 shall be referred to. The amount of water to be added shall be then adjusted to compensate for any observed variation in the moisture contents. Proper control of mixing water is deemed of paramount importance. Mixtures with automatic water measuring drums shall be used or else. Water should be measured by volume in calibrated buckets. All measuring equipments shall be maintained in a clean serviceable condition and the accuracy periodically checked and got certified by the Engineer-in-charge. The contractor shall carryout slump tests apart from taking test cubes at regular intervals. All such methods of sampling and analysis of concrete shall be in accordance with IS – 1199.

Mixing of concrete shall be strictly carried out in an approved type mechanical mixer. The mixing equipment shall be capable of combining the aggregates, cement and water within the specified time (not less than 2 Minutes) into a thoroughly mixed and uniform mass and of discharging the mixture without segregation. Mixing shall be continued until there is a uniform colour and consistency. Concrete shall be handled from the place of mixing to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of any of the ingredients. Before depositing the concrete, all debris and dirt shall be removed from the space to be occupied by concrete. Concreting shall not be done unless the form work conform to the shapes, lines and dimension as shown in the drawings.

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Unless otherwise approved, concrete shall be placed on single operation to the full thickness of slabs and beams and similar members and not exceeding 1 metre deep in walls, columns and similar members. Concrete shall be placed continuously until completion of the part of the work between construction joints or as directed by the Engineer-in-charge. The concrete after being laid shall be compacted by means of vibrators of approved type under proper supervision as directed by the Engineer-in-charge. Care should be taken to avoid segregation and formation of air bubbles. The whole process starting from the mixing of concrete to the placing and compaction shall not take more than 20 minute and the process shall be completed before the initial setting takes place. Curing shall be accomplished in accordance with IS-456 by keeping the concrete covered with a layer of sacking, canvas or similar absorbent materials and kept constantly wet for the period as directed by the Engineer-in-charge.

Reinforcement

All reinforcement shall be clean and free from pitting, loose mill-scales, dust, loose rust and coats of paint, oil or other coatings which may destroy or reduce bond. General construction details and workmanship relative to reinforcement including bar bends, lap splices and installation shall be in accordance with the IS-2502 as well as IS-456. All bars be bent as per the bar bending schedules indicated in the drawings or supplied separately relevant to particular drawing. The contractor shall in all cases verify himself the correctness of schedules, giving the number, length and the bending details of the bars. The numbers, sizes, shape and position of all the reinforcement shall, unless otherwise, directed or authorized by the Engineer-in-charge be strictly in accordance with the drawing. The reinforcement shall be adequately held in position by 18 / 20 SWG soft black annealed binding wire. The contractor must obtain the approval of Engineer-in-charge for the reinforcement placed, before any concrete is placed in the form. All reinforcing bars shall be so tied as to form a rigid cage to prevent displacement before or during concreting. Rate quoted for reinforcement should include cost of transporting M.S. Rods / CTD bars from BHEL Store to site of work, cleaning, cutting, bending, placing, binding with contractor's own binding wire and providing necessary cover blocks of concrete but excluding cost of steel which shall be supplied free of cost at BHEL Stores.

Form Work

Form work shall conform to the shape, lines and dimensions of concrete and RCC structures as shown in the drawings and shall be well within the permissible tolerance. Form work for concrete shall be of plywood, steel, good seasoned timber or other approved materials, properly designed easy for removal and cleaning. They shall be of sufficient strength and rigidity to maintain their position and shape under loads incidental to placing concrete. The number of props, their sizes and dispositions shall be such as to able safely carry the full dead load area constructional loads. The arrangement and alignment of formwork shall be got approved by the Engineer-in-charge prior to concreting. However this shall not relieve the contractor from his responsibility for proper work and safety. Form work shall be sufficiently tight to prevent loss of cement slurry from the concrete. All joints and holes in the form work shall be caulked with putty jute cloth or other approved materials to the satisfaction of the Engineer-in-charge. The stripping time for the shuttering and the formwork shall in general conform to the provisions in the relevant clauses of IS 456. Unless otherwise specified rates for reinforced cement concrete shall include cost of centering, shuttering charges also.

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Expansion and Other Joints

Expansion Joints in concrete structures shall be provided at specified places as indicated in the drawings. The material shall be as specified by the Engineer-in-charge, expansion joints, with or without metal strip shall be as shown on drawings the filler shall be "EXPANDEX JOINT FILLER" premoulded non – extrudent type fibrous joint filler impregnated with bitumen conforming to IS : 1838 – 1961. The filler shall be durable, water proof, compressible and shall have a high degree recovery after compression is released, ensuring thereby that no free space develops in the expansion joints. The top 25 mm, or as specified in the drawings, shall be sealed with "SHALITEX SEALING COMPOUND" or equivalent after application of approved primer.

4. Stone Masonry

General : Stone masonry shall conform to TNBP 35. Stone shall be obtained from the approved quarry and shall be free from decay and weathering.

All stones shall be thoroughly wetted before use. The mortar used for jointing shall be as specified under the respective items of the ' Bill of Quantities'.

The walls shall be carried up truly plumb. Every stone shall be carefully fitted to the adjacent stones so as to form neat and closed joints.

To give sufficient lateral bond, vertical joints shall be avoided. Prescribed number of headers as required shall be provided to give sufficient transverse bond. At junctions of wall the stones each alternate course shall be so carried into each of the respective walls as to unite the work thoroughly. Where breaks are unavoidable in carrying up the work continuously in horizontal course sufficiently long steps shall be left to joint the old and new work building of two thin faces and filling up the middle with small stuff or dry packing shall be strictly avoided. When plastering or raised pointing is not required to be done joints shall be struck flush and finished simultaneously.

Coursed Rubble Masonry

Coursed rubble masonry shall conform to TNBP 35-H, I and J. Faces shall be accurately squared and all face joints shall be dressed at right angles. This bushing on the facing stones shall not project more than 38mm.

Face stones shall be laid alternate headers and stretchers. Depth of each course shall not be less than 150 mm. No course shall be greater than any course below. The height shall not exceed the breadth of stones of face. No stone shall tail into the wall less than its height. No pinning shall be allowed on the face. The stones shall be solidly bedded set full in mortar with joints not exceeding 12 mm in thickness.

Random rubble masonry

Random rubble masonry work shall conform to TNBP 35-L and J. Stones shall be hammer dressed at faces and joints to enable them to come into close proximity with each other. The face stone shall be laid headers and stretchers alternately, so as to break joint by at least 75mm. Thickness of joint shall not exceed 12mm. No pinning shall be used on the face and face stone shall extend well back into the headers. Stones less than 130 mm. in height shall not be used on the face.

Bond stones running through the wall shall be provided at 1.8M intervals in walls up to 0.60 M. thickness and if the wall is more than 0.60 M. thick a line of headers shall be laid from face to back each header overlapping the other by at least 150 mm.

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5. Brick Masonry :

First class Bricks : Brick shall be sound, hard, tough, rectangular in shape and size, well burnt of uniform deep red or copper colour and conform to IS – 1077.

Brick shall be free from cracks, chips, flaws, stone or humps of any kind. Bricks shall be homogeneous in texture and emit a clear ringing sound on being struck and shall have a minimum compressive strength of 70KG / sq.cm. and shall not absorb water more than 20% of its weight, when soaked cold water for 24 Hrs. All bricks shall be table moulded.

Second Class Bricks : These shall be ground moulded but should otherwise conform to the specifications of first class bricks except for some surface cracks are allowable. These shall have minimum compressive strength of 70 Kg./sq.cm.

Samples of each type of brick, shall be got approved by the Engineer-in-charge before being used. All subsequent deliveries shall be up to the standards of the approved samples.

Brick work shall conform to TNBP31 and IS –2212.

Brick works shall be classified as first or second class according to the classification of bricks used and the method of laying. The thickness of joints shall not exceed 6 mm. In first class brick work and 10 mm in second class brick work.

Unless otherwise specified in the Bill of quantities standard metric bricks of size 19cm X 9 cm X 6 cm. shall be used.

Bricks shall be well soaked before use on works for at least 6 hrs. The soaked bricks shall be kept on wooden planks or platform. Brick required for masonry with clay or lime mortars shall not be soaked.

Brick work shall be laid with specified mortar to be prepared in accordance with IS –2250. Brick works shall be laid in English Bond unless otherwise specified. Half or cut bricks shall not be used except when needed to complete the bond. Each course shall be taken up truly plumb, if battered, the batter is to be truly maintained. The level of brick work shall be checked up at every one metre interval. Bricks shall be laid with frogs upward, while laying bricks shall be thoroughly bedded and flushed in mortar and taped into position with a wooden mallet and the superfluous mortar removed. Walls of all structures shall be carried up regularly in all cases, leaving no part, one metre lower than the other. Where the masonry of one part has to be delayed, the work shall be raked back according to bond (and not toothed) an angle not exceeding 45 Deg. But the raking back should not start within 60cm. of a corner vertical joints in alternate courses shall come directly over one another. The brick work shall not be raised more than 14 courses per day. All iron fixtures, pipes, conduits, drains, sleeves, bolts, holdfasts of doors and windows etc. which are required to be built in walls shall be embedded in cement mortar or cement concrete as specified, in their correct position as the work proceeds.

Joints

Joints shall be restricted to 6 mm in first class brick work and 10mm in second class brick work. All bed joints shall be normal to the pressure upon them, radial in arches and at right angles to the face in battered retaining walls. Care shall be taken that all joints are fully mortared (proportion as specified in the schedule items) well flushed up and in case where no pointing to be done, neatly struck at the work proceeds. The joints in faces which are to be plastered or pointed shall be squarely raked out to a depth of 12 mm while the mortar is still green. The raked joints shall be well brushed to remove loose particles. After the work the faces of work shall be cleared well by brush so as to remove any splashed mortar during the course of raising the brick work.

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Curing

Green work shall be protected from rain by suitable covering. Masonry work shall be kept thoroughly well watered on all faces for atleast 10 days after completion. In case of fat lime mortar curing shall commence two days after laying of masonry and shall continue for seven days.

6. Scaffolding

Scaffolding will generally be single but may be double if warranted for the particular work as approved by the Engineer-in-charge. The contractor shall take all measure to ensure safety of work and the working people.

Payment for brickwork shall be made on cubic metre basis on the volume of actual work done. Half brick wall and brick on edge wall shall be paid on square metre basis. The rate of brick work shall include scaffolding and all items mentioned above and no extra payment will be made for cutting bricks if required either for openings or for rounding or insertions or for recesses at the time of brick wall construction.

7. Damp Proof Course

Damp proof course shall either be with cement concrete or with cement mortar of specified thickness as mentioned in the relevant item of schedule. Damp proof course shall not be carried across doorways. It shall be laid for all walls except verandah retaining wall or for particular wall only directed by the Engineer-in-charge. It shall be laid flush with floor level or as instructed by the Engineer-in-charge.

Damp proof course with cement concrete shall be of 25 or 38 mm thick in cement concrete M-150/M-200 as specified using 12mm. and down size aggregate well rammed and smoothed with trowel. It will be kept wet for 40 hours and after it has dried, two coats of hot bitumen shall be applied over it and allowed it to dry after which sand shall be sprinkled over it.

Damp proof course with cement mortar shall be 12 or 20 mm thick in cement mortar 1:3 well mixed with crude oil at 5% by weight of cement used.

8. Cement Plastering :

Cement plastering shall be in accordance with IS – 1661 and TNBP –56 & 57, Cement mortar shall conform to IS – 269. The mortar of specified mix and thickness shall be used.

The surface to be plastered shall be thoroughly cleaned so that it is free from dust, oil, salts etc., The joints of masonry shall be raked out to a depth of atleast 12 mm. On cement concrete surfaces the surface shall be cleaned with wire brush and scarified by lines with trowel or hacking done. The surfaces in both cases shall be washed properly and kept wet for 4 hours before plastering is commenced.

Plastering shall be started from top and gradually worked down towards the floor. It shall not at any place be thinner than specified. To ensure even thickness plaster of about 15 cm X 15 cm shall be first applied horizontally and vertically at not more than 2 metres intervals over the entire surface to serve as gauges. The surface of these gauges shall be truly in the plane of finished surface. The mortar shall then be laid in the wall or other surfaces between the gauges and finished even. All corners shall be rounded to a radius of 24 mm unless otherwise directed. The contractor shall not be paid for any extra thickness of plaster done than as specified.

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Plaster, when more than 15 mm thick shall be applied in two coats, a base coat followed by the finishing coat. Thickness of the base coat shall be just sufficient to fill up unevenness in the surface, no single coat, however, shall exceed 12mm in thickness. The under coat shall be roughened or scratched before it is fully hardened.

Curing shall start 24 hours after the plaster is laid. It shall be kept wet for 14 days. During this period it shall be suitably protected from all damages at the contractor's cost by such means as approved by the Engineer-in-charge.

Any cracks which appear in the surface shall be cut out in rectangular shape and redone as directed by the Engineer-in-charge. Wherever specified standard waterproofing compound as approved by the Engineer-in-charge shall be added to the mortar at the rate of 2% or as specified by the manufacturer by the weight of cement for which the rate shall be paid separately. The rate for plastering shall include cost of scaffolding, swing etc., needed for the work with labour and material all complete.

9. Steel Door, Windows and Ventilators :

All steel doors, windows and ventilators shall conform to IS – 1038, IS – 1361 and IS 1081 or equivalent as mentioned in the bill of quantities and as approved by the Engineer-in-charge.

Rolled steel sections shall conform to Is – 226. The sections shall be cold straightened and finished goods shall be free from bends and other defects. Materials used in the fabrication shall be the best procurable and conforming to relevant IS specification. Thickness and specification of the glass to be provided shall be as indicated in the relevant item of the bill of quantities. Glass shall be free from flaws, specks, bubbles, etc., Bolts, nuts, screws, peg stays and other mild steel fittings shall be treated for corrosion as per relevant Indian Standards. Putty for glazing shall conform to IS – 420.

Doors, windows and ventilators, etc., shall be truly square and free from twist and warp. They shall be constructed of sections which have been cut to the required lengths and welded or rivetted at the corners as per standard specifications.

All steel surfaces shall first be thoroughly cleaned free of rust scale or dirt and mill scale by approved means and shall be painted with one coat of approved primer conforming IS – 102 before despatch. Alternatively if specified they may be galvanised by the "Hot dip" zinc spray or electro galvanising process described IS – 1361. Doors, windows and ventilators shall be fixed in positions, as specified under IS 1081.

Whenever contractor is required to supply the doors, windows and ventilators etc., he shall first submit to the Engineer-in-charge, the details about source of supply, detailed drawing and specifications etc., for prior approval.

10. M.S Rolling Shutters :

It shall be of approved quality, made out of 18 gauge 75 mm black laths mechanically operated by reduction gear type mechanism. It shall be fitted with two self-aligning ball bearing with locking arrangements (both inside and outside) including M.S pressed side guides bottom rails brackets and top rolling spring pressed etc., complete provided with locking arrangements for padlocks, pulling hooks, handles, top cover etc., It shall be painted with one coat of approved primer conforming to IS – 102 before despatch.

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11. Wooden Doors, Windows and Ventilators :

All wood work for doors, windows, ventilators cup board, shelves, etc., conform to relevant IS specification and TNBP 82 and shall be well seasoned teak wood or well seasoned country wood (pillamarudu or karumarudu) as the case may be. Timber shall be best quality and shall be free from knots, injurious open shales, bore holes, decay, soft or spongy spots, hollow pockets and all other defects and blemishes. Timber shall conform to IS 1003 (Part 1) 1966. Size of doors, windows and ventilators shall as specified in the relevant item of schedule and detailed drawings and generally in conformity with IS – 1003, part I and part II of 1966. The rates for doors, windows and ventilators etc., shall be for the finished work inclusive of fixing them in position with necessary iron hold fasts and furniture fitting of oxidized iron or aluminium or oxidized brass as stated in the description of the relevant items of the bill of quantities and as directed by the Engineer-in-charge. Fittings and furniture shall be of best quality and machine made and robust type. Wherever glazed shutters are to be provided, the cost of glass panes of specified thickness and fixing them in position should be included in the quoted rate. All glass shall be of superior quality from approved manufacturer. In case of solid core flush doors, they should conform to IS:2202 Part I and Part II. The flush door shutters should have a finished thickness as specified in the scheduled item. Flush door shutters shall be obtained from firms of repute as approved by the Engineer-in-charge.

12. ROOFING : (A) R.C.C Slabs :

Roof slab shall be of RCC of specified mix conforming to IS : 456, with adequate main tensile, transverse and adhesive reinforcement of ribbed steel bars of mild steel rounds. Unless otherwise mentioned the rates for RCC slab shall include cost of concrete, centering and shuttering charges, vibration charges, rounding of corners, curing and finishing etc., complete. Expansion joints in reinforced cement slabs shall be as per TNBP 30.

The ceiling should be finished as per Clause 30 of TNBP. No extra payment shall be made towards cost of ceiling plaster necessitated on account of defective centering materials used or poor workmanship.

The top of roof slab shall be finished with weathering course treatment if so specified. The weathering course work shall conform to TNBP 44-HJ and consist of concrete with broken brick in neat slacked lime of specified thickness finished with one course of pressed split tiles / pressed tiles of specified thickness and size as described in the bill of quantities.

(B) Roofing and Side Cladding with A.C. sheets :

The A.C. sheets shall be of specified and approved quality and shall conform to IS 459- 1962 in all respects. The sheet shall be laid with the smooth side upwards and with a minimum end lap of 15cm. and for every flatter slopes this should be 20cm. The laying operation shall include scaffolding works involved. Sheets shall be secured to the purlins by means of 8mm galvanized iron J or L hook bolts and nuts. The grip of the hook bolt on the side of the purlin shall be not less than 25mm. Each bolt shall have a bitumen washer and galvanized iron washer placed over the sheet before the nuts are screwed down from above. Hole for hook bolts etc., shall be drilled and not punched in the ridges of the corrugations in the exact positions. The diameter of these holes shall 1.5 mm more than the diameter of the fixing bolts. The payment will be square metre basis of the laid area.

13. A.C. Rain Water Pipes

The pipes shall be of standard quality conforming to IS 1628 – 1960. These shall be straight, true smooth and regular in thickness. They shall be free from cracks and other flaws. The supply shall include all necessary pipe fittings and accessories.

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All pipes shall be fixed to wall or columns by standard M.S butt holder clamps of approved make. The spigot of the upper pipe shall be properly fitted into the socket of the lower pipe, such that there is uniform annular space for filling with the jointing materials. One third depth of this annular space is to be filled with spun yarn soaked in bitumen of approved quality and properly pressed with caulking tool. The remaining two, third depth of the joint is to be filled with Cement Mortar 1:2 (1Cement : 2 coarse sand) and shall be pressed with caulking tool and finished smooth at the top at an angle of 45 Deg. sloping up.

The rate shall include supplying and fixing pipes with specials and accessories, including sizing as required, jointing, testing, cutting of walls and making good necessary scaffolding etc., complete.

14. Flooring :

Flooring shall consist of a base course of cement concrete of specified thickness and proportion laid over the compacted earth or sand filling as specified and a finishing layer of concrete, mosaic, glazed tiles or any other material as specified to be laid. Flooring work for Factory shop floors as well as mosaic flooring shall be done as per the special specifications.

The bed flooring shall be prepared either level or sloped as per relevant drawing or as instructed by the Engineer-in-charge. Filling in basement with earth or sand shall be in accordance with TNBP 25. On the prepared bed, cement concrete of specified mix and thickness shall be laid and well consolidated.

A. Ellispattern, 1st Sort Flooring

On the clean wet surface of the concrete base before it has set, will be laid a layer of cement concrete to give a finished depth of 20/25 mm over the base concrete. The cement concrete will be of 1:3 proportion (one cement and 3 hard broken stone chippings 3 to 10 mm Size). To make a coloured floor red oxide iron powder or other approved materials should be mixed with cement at the rate 10% of the weight of cement or as directed by the Engineer-in-charge. Ellis pattern flooring shall be done as described under clause 41-G of TNBP.

B. Glazed Tile Flooring

The tiles shall be of ceramic white or coloured and of specified dimensions as described in the schedule item. The top surface of tiles shall be glazed with a neat finish of uniform colour and texture and free from flaws, cracks, craze, specks or other imperfections. Tiles shall be true and shape with straight edges, non-absorbing and non – fading. Samples of tiles together with manufacturer's literature shall be submitted to the Engineer-in-charge for approval. Tiles shall conform to IS 177 latest.

Over the prepared surface of the floor a bedding layer of Cement Mortar (1:3) of specified thickness shall be laid-in-proper level and slope using screed patterns. The bedding layer shall be deeply scratched while it is set. A mortar set bed of 6mm thickness in cement lime mortar 1:1:3 (one cement one lime putty and three sand), shall be laid over the bedding layer. After mortar setting, bed has been leveled, a skin of neat cement shall be trowelled to the mortar setting bed immediately before the tiles are set. As soon as the mortar setting bed has sufficiently hardened, all tiles shall be finally secured in place and gently beaten in and finished surface brought to desired level. When grouting the glazed tiles, special care shall be taken to prevent scratching of the glazed surface. Joints shall be pointed with white or coloured cement to match the tile surface and cured. No joint shall be more than 1.5 mm thick.

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15. White Washing and Colour Washing

White washing and colour washing shall be done as per clauses 63 and 64 of TNBP. The surface shall be thoroughly cleaned off mortar drops and foreign matter. All patchings must be scraped properly. The white washing shall be done from pure shell lime. Samples of lime shall be got approved by the Engineer-in-charge. The wash shall be applied with a brush, the coats being laid on vertically and horizontally alternatively, each coat being allowed to dry before next coat is applied. For colour washing the desired shade shall be obtained by mixing approved quantity of colouring matter or distemper with shell lime solution and applied as per white. The contractor shall take every precaution to prevent white wash being splashed on wall, floor and other places and articles not to be white washed. No colour wash shall be done unless a sample pattern of the mixed colour has been approved by the Engineer-in-charge. The rates shall be inclusive of scaffolding charges, cost of ladder etc.,

16. Painting

All painting work shall be done in accordance with TNBP-66 and the relevant Indian Standard Specifications. Paints, varnishes, cement paints etc., shall be the highest grade products of well known approved manufacturer and shall be delivered to site in original sealed containers. It is desired that materials of one manufacturer only shall be used as far as possible. Colours shall be uniform and nonfading. Samples of all colours selected shall be submitted to the Engineer in charge for approval before bulk purchase is made. All finished work shall match corresponding samples kept with the Engineer.

Preparation of Surface :

Before painting wooden surfaces, protruding timber fibres shall be removed and nail marks shall be covered with putty. The surface shall be thoroughly cleaned and sand prepared. In case of steel work it shall be scraped, well brushed and cleaned free of rust, scale dirt. Base preparation for painting concrete, masonry and plastered surfaces shall be carried out as per IS 2395 – Part I of 1966. Before actually proceeding with the work of painting the concrete, masonry and plastered surfaces, it shall be verified that the surfaces shall be completely dry, free from efflorescence and alkaline effect.

Application

The primer shall be applied with brushes and spread as evenly and as smooth as possible. For steel work a priming coat of anti corrosive paint shall be applied. Painting shall be done by skilled labourers in a work-man like manner. All coats shall be of proper consistency and shall be well brushed out, so that no brush marks are visible. The under coating should be nearest to the specified colour of the finishing coat. Unless otherwise specified ready mixed synthetic enamel paints shall be used for painting, wood and steel work. Under coats should be completely dry before finishing coat is taken up. Priming coat and under coat shall be rubbed with sand paper and dusted clean. The finished coat of approved paint shall then be applied.

17. Cement Painting

Cement Paint solution shall be applied to the surface with hair brushes in a number of coats to get uniform finish. After the first coat of paints has hardened, it shall be cured with water atleast for 24 hours. The surface shall be wetted again before the application of the second coat. Atleast 24 hours should lapse between the two coats, number of coats shall be as specified in the schedule of quantities. It shall be kept damp atleast for seven days.

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18. French Polish

French polish to be used shall comply with IS 348. Polishing shall be obtained by dissolving 1 lbs. of shellac in one gallon of methylated spirit without applying any source of heat. After the shellac has dissolved $\frac{1}{4}$ lbs of cobalt, $\frac{1}{4}$ lbs of lobano and 0.4 oz of crystals of desired pigment shall be added. The solution shall be applied with a pad of fine muslin cloth tied as per general practice. The pad shall be dipped into the solution and wrung with fingers and be rubbed hard on the surface in this way, the first coat is to be given after this gets dried up, the successive coats shall be given in the same fashion till the mirror like surface is obtained. The wood to be polished shall be first applied with a filler composed of 1.25 Kg. of whiting mixed with one litre of methylated spirit and then sand papered when dry. The finished surface shall have uniform texture and gloss. Approved transparent sealer shall only be used in base preparation.

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Ranipet

SECTION II

TECHNICAL SPECIFICATION ELECTRICAL

Section II – Technical Specification for Electrical work.

Detailed specification has been given in the Bill of quantities for incorporating in the work.



Ranipet

SECTION III

TECHNICAL SPECIFICATION SUPPLY AND ERECTION OF AIR CONDITIONING DUCT EXTENSION & COMPONENTS

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VOLUME I (SPECIFICATIONS)

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 - GRILLES AND DIFFUSERS
 - INSULATION
 - ELECTRICAL WORKS
3. LIST OF APPROVED MAKES

1.0 GENERAL SPECIFICATION

GENERAL

SCOPE:

The specifications, read in conjunction with the drawing and BOQ cover the Supply, Installation, Testing and Commissioning of Air Conditioning System

BUILDING:

The Scope of works covers the Lowside works of the HVAC system for BHEL, at IITM Building, Chennai. Refer to the Architectural, Structural and Interior layout drawings for the respective areas. The work involves the Airconditioning of internal space mainly using the Base Builder provided Ceiling mounted Air Handling unit. The work involves all ducting from the AHU, plenum, dampers, ducting, insulation and the associated Air terminal devices. The scope also includes independent hiwall type split units for meeting and server rooms.

Basis of Design

Location	Chennai
Air Handling Unit	Provided by builder

Inside Design Condition

Working office areas	24°C Dry Bulb \pm 1.1°C
RH (no control on RH)	not exceeding 60%

Work At Site:

The Contractor shall inspect the site and ascertain for himself the nature, character and extent of work to be executed and shall include all items and services necessary irrespective of whether these are specifically mentioned or not in the specifications, drawings or schedule of equipment. Any accessory/item needed to meet with the intent and purpose of these specifications and necessary for the safe running of the plant shall be deemed to have been included.

Performance Guarantee:

The contractor shall guarantee the Air-conditioning system individually and collectively will to maintain conditions as per specifications and drawings. The contractor shall also guarantee that, under operating conditions, the performance of the various equipment shall not be less than the specified ratings listed in the finally accepted Schedules of Equipment

The contractor shall guarantee that the entire installation will be carried out in such way that the noise levels mentioned in the specifications will not be exceeded.

Tender Drawing:

The tender drawings are not meant to be used as working drawings. The contractor shall prepare detailed working drawings and get them approved by the client before start of the work.

The bidders shall list out all the deviations from the drawings and specifications, if any before submitting their offer.

Electrical Equipment:

All electrical equipment shall be suitable for 230V \pm 10%, 1 phase, 50 Hz / 415V \pm 10%, 3 phase, 50 Hz, 4 wire AC supply unless otherwise stated.

PRECOMMISSIONING CHECKS

The contractor shall submit a detailed procedure for pre-commissioning checks for the complete Duct and Pipe systems for approval. This will include procedure for ensuring that the Air and water systems are clean and dust free. A similar procedure will be agreed upon for Electrical installation..

COMMISSIONING:

The contractor shall submit a detailed procedure for commissioning, testing and balancing the Air and water systems. a list of the testing instruments.

GENERAL NOTES

- 1.0 These specifications are for work to be done, item to be supplied and materials to be used in the works as shown and defined on the drawings and herein to the satisfaction of the Owner/ Architect/Engineer
- 2.0 The workmanship is to be the best possible and of a high standard. The contractor shall take all steps immediately to make up deficiency if any noticed by the Owner / Architect. Use must be made of special tradesmen in all aspects of the work and allowance must be made in the rates for the same.
- 3.0 The materials to be provided by the contractor shall be in accordance with the samples/submittals approved by the Owner / Architect and in conformity with specification and approved list of manufacturer /brand. The contractor shall produce all invoices, vouchers or receipts for any materials if called upon to do so by the Owner/ Architect/Engineer
- 4.0 Samples of all materials are to be submitted to the Owner/ Architects for their approval before the contractor orders or delivers the material to the site. Samples together with their packing are to be provided free of charge by the contractor and should any materials be rejected they will be removed from the site at the contractor's expense.
- 5.0 The contractor shall be responsible for providing and maintaining temporary coverage required for the protection of works in progress and also finished work.
- 6.0 Contractor shall maintain uniform quality and consistency in workmanship throughout the execution of the work.
- 7.0 The contractor shall provide: All materials, labour, maintenance, fixing, carrying, cleaning, making good, etc. temporary canvas, plastics and any other requisite protection of the works. All the necessary equipment, labour and removal of the same at the completion of the work. The Engineer will be the sole judge in deciding as to the suitability of the tools or plants that may be brought on the works by the contractors, for the proper execution of the work.
- 8.0 All measuring tapes shall be of steel and scaffolding and ladders that may be required for taking measurements shall be supplied by the Contractors.

- 9.0 The Contractor shall place at the disposal of the Employer and the Architect and the advice of himself and his firm, and their staff or Foreman of trades or other skilled person employed by him or them for the conduct of the works comprised in the Contract.
- 10.0 The Contractors are to take care in loading and unloading materials for the works, so that the roads and footpaths are not obstructed, damaged or the traffic impeded, and they must conform with the Police Regulations for carrying, loading and unloading all materials, plant, earth, debris, etc. to and from the buildings.
- 11.0 The Engineer shall have full powers and authority to issue such instructions as to the order of proceeding with or carrying out the work as he may deem necessary for the guidance of the Contractor and contractor shall be bound by such instructions of the Engineer or any person authorized by the Architect to give such instructions.
- 12.0 The levels and measurements of the existing site, as shown in the drawings, are believed to be correct, but the Contractor should verify them for himself. No claim or allowance whatsoever will be entertained hereafter on account of any errors or omission in the description of the site turning out different from what was expected or shown in the drawings.
- 13.0 The Contractor shall work in co-ordination with the Architect and contractors from other services like Electrical, Fire Fighting/Detection, Security System and any other contractor working for other works involved in the project and provide all necessary assistance to them for successful completion of the project.
- 14.0 Any loss or damage caused due to fault or negligence on the part of Contractors laborers, staff etc. during working in the premises will be made good by contractor at no extra cost or the damage and repair cost will be reimbursed in full to the Employer.
- 15.0 All the contractors should consider the below mentioned points before quoting for the job.
- Ducting, Piping, Insulation and Grilles samples have to be submitted and approved and the materials supplied must exactly match the samples submitted before they are fixed as required.
 - Contractor should be responsible for lifting of the material to the respective floors and expenses of the same should be borne by him.

2.0 TECHNICAL SPECIFICATIONS

HI WALL SPLIT AC UNITS SCOPE:

The scope of work comprises supply, installation, testing and commissioning of the Hi-wall Split AC units as per the following:

1. Evaporator unit with mounting brackets/supports.
2. Air-cooled condensing unit with outdoor support structure. The outdoor support structure shall be painted with 2 coats of epoxy primer and 2 coats of epoxy paint.
4. chordless remote control.
6. Installation accessories mounting brackets, refrigerant piping, filter Drier etc.
7. First charge of R – 22 refrigerant gas and oil.
8. Refrigerant Piping with insulation as specified elsewhere
9. Drain piping for evaporator unit.
11. Insulation of refrigerant piping and drain piping.
12. Electrical wiring between indoor and out door units.
13. Testing and commissioning.

The Contractor shall submit the technical data sheet as published by manufacturer along with the tender

INDOOR UNIT

The room unit shall be suitable for mounting on the on wall. The unit shall consist of an evaporator fan and motor, evaporator coil, wherever shown in drawing additional drain tray, air filter, outlet for duct connection, a casing and controls.

The evaporator fan shall be double inlet, double width with centrifugal forward curved impellers statically and dynamically balance. The impellers shall be mounted on either side of a double shafted 2 speed motor directly driving the fans. The fans shall be housed in a high impact ABS plastic enclosure which is acoustically treated. Cooling coil of the Evaporator shall be constructed from 3/8" O.D. copper tubing with serrated and extended aluminum fins. Provide hydrophilic coated aluminum fins to minimize the angle of contact between water droplets and fins. The refrigerant lines brought out to plain stub ends within the unit casing.

Out door unit

The out door condensing unit shall comprise a compressor, condensor coil, condenser fan, refrigerant connections and a casing. The compressor shall be hermetic type resiliently mounted for quiet operation. The compressor drive shall be a single phase motor refrigerant cooled and shall have an inbuilt over load protector. The unit shall be capable of frequent starting and stopping without causing any over load.

The condenser coil shall be a copper tube with aluminium fins. The tube shall be not less than 10 mm with a wall thickness of 0.4 mm copper. Tube shall have aluminium fins adequately bonded through a process of mechanical expansion. The condensor fan shall be a multiblade propeller type designed for low noise and directly driven by a totally enclosed fan motor. The refrigerant connections shall be brought out into plain stub ends.

Casing:

The unit casing shall be heavy gauge MS construction and finished with anticorrosive powder coating to give protection against rusting in high humid condition.

REFRIGERANT PIPING:

Refrigerant piping shall be copper type L with brass fittings and suitable for flared connections. Piping shall be tested under vacuum of 7mm HG absolute for 24 hours prior to charging. Vacuum to be achieved using a vacuum pump. Use of compressor for vacuuming is not permitted.

The contractor shall notify the customer when the system is ready for testing as detailed above. The contractor shall submit a inspection request for the vacuum test which will be witnessed at the time of the start and end of the 24 hour test. This procedure will be followed without fail for each individual unit.

Sleeves shall be provided around refrigerant pipes crossing the wall and wooden partition

Refrigerant pipes should be supported suitable metal clamps. The distance between two supports should not be more than 5 ft.

SHEET METAL WORK: SCOPE:

This section covers the specification for the supply, installation, testing and commissioning of the sheet metal duct system.

MATERIALS AND CONSTRUCTION:

Unless otherwise specified, the material of construction of the ducts shall be galvanized steel sheets. The galvanized steel sheet shall conform to IS: 277

Ducts shall be rectangular in cross section and shall be fabricated in accordance with the following:

Max. Size in mm	Min. Thick in mm	Transverse joints	Reinforcement	Hanger Rod dia. In mm
Below 400	0.63 (24 SWG)	Slip joints	Cross break	8
401 - 750	0.63 (24 SWG)	Slip joints	Cross break	8
751 - 900	0.80 (22 SWG)	38 x 38 x 4.2 mm Companion flanges	25 x 25 x 4 angle @ 1000 mm intervals	8

901 -1500	0.80 (22 SWG)	38 x 38 x 4.2 mm Companion flanges	38 x 38 x 4 angle @ 760 mm intervals	10
1501 -2250	1.00 (20 SWG)	38 x 38 x 4.2 mm Companion flanges	38 x 38 x 4 angle @ 760 mm intervals	10
2250 and above	1.25 (18 SWG)	50 x 50 x 4.2 mm Companion flanges	50 x 50 x 4 angle @ 610 mm intervals	12
Plenums	1.25 (18 SWG)	50 x 50 x 4.4 mm Companion flanges	50 x 50 x 5 angle @ 300 mm intervals	12

Ducts up to 2250mm size shall be supported at intervals of 2.4m and for larger ducts supports shall be provided at 1.2m intervals.

The reinforcements / bracing shall be as per ISS 655-1998.

Girth angles and companion flanges shall be mitered and welded at corners and riveted to duct sheets at 75mm centers. Flanged joints shall be made with 9.5mm G. I. bolts spaced at 15cm centers. Approved duct gaskets shall be used between the flanges. All joints and seams shall be rendered airtight. All duct seams and joints to be sealed with silicon sealant to stop supply air leakage. Duct panels are not to be cross-broken if insulated with rigid board insulation

All ducting supports, bracing & frame work shall be painted with 2 coats of epoxy primer & 2 coats of epoxy paint min. 50 microns.

Insulated Flexible Ducts:

The inner core of the Flexible Ducts shall be made of triple lamination of Aluminium foil, Polyester & Metalised Polyester film permanently bonded to coat spring steel wire helix. Fiberglass insulation of minimum 14 kg/cum. density, having R-Value $4.2^{\circ} \text{ F-Ft}^2 - \text{hr/Btu}$ and 1.25" thickness shall be wrapped over the inner core & covered with strong outer jacket cum vapour barrier made of fiberglass reinforced metalized polyester film laminate.

Care must be taken to install all the flexible duct in fully extended position and bends made with adequate radius as per manufacturer recommended practices.

Duct should conform to fire rating standards BS-476 part 5, 6 & 7.

ACCESSORIES:

All dampers, unless otherwise specified or noted on the drawings, shall be louver dampers having multiple opposed blades type or with parallel blades of aerofoil construction. The construction of the dampers shall be robust and made of 18 gauge galvanized sheets. The dampers should be atleast 150 mm deep and the flanges shall be 40 mm. Blades shall be connected with a suitable linkage for operation by an extended lever which shall have a locking quadrant with positions of the damper indicated on it. Dampers and their operating device shall be made robust, easily operable and where required they shall be accessible through suitable access doors in the ducts.

Dampers shall be provided in ducts at every branch supply or return air duct connections whether or not indicated on the drawings for the proper volume control and balancing the system.

Transverse joints shall be provided with rubber gaskets (6mm thick) of nonflammable type. In no case shall the use of felt be permitted.

Connections to fan sections shall be flexible, double thickness fiberglass cloth or equivalent nonflammable material.

INSTALLATION:

The duct fabrication and installation shall generally conform to IS 655-1998.

The contractor shall provide and neatly erect all sheet metal work as shown on drawings or as may be required to carry out the intent of the specification and drawings. The installation shall meet with the approval of the Engineer in all its parts and details. All ducts shall be supported from the slab above or from beams. Duct supports shall be fixed using anchor fasteners.

Where ducts are installed above false ceilings, the duct should not be supported from ceiling hangers. Care should be taken to ensure that the duct / duct support should not touch or rest on the ceiling members.

All ducts shall be rigid and shall be adequately supported where required with standing seams tees or angles of ample size to keep the ducts true to shape and prevent buckling, vibration and breathing.

Bends shall be made with radius not less than one-half of the width of the duct or with scientifically designed internal curved vanes as approved by the Engineer. Two vanes shall be spaced so that the aspect ratio of each of the individual elbows formed by the vanes will be about five to one.

Where metal ducts or sleeves terminate in woodwork, brick or masonry openings, tight joints shall be made by means of closely fitting heavy flanged collars.

Suitable foam material shall be provided between duct and duct supports.

GRILLES AND DIFFUSERS:

Wherever specified in the B.O.Q. shall be in Aluminum construction.

Fixed Bar Linear Grilles:

Fixed bar grilles will be in extruded aluminum construction. Bars shall be fixed in position using vertical tie bars. Bar spacing shall not exceed 12mm and the grilles shall have 60% free area. Deflection angle of the bars shall be as specified in the B.O.Q. Finish of the grille shall be powder coated in a shade approved by the Architect. Irrespective of grille finish, vertical tie bars shall be powder coated in Matt black. Supply air outlets shall be provided with volume control dampers to be installed in the duct collar. Dampers shall be in black Matt powder coated finish. Grilles shall be similar as more specifically. Supply air outlets shall be provided with end closure pieces for the supply portion of the grille. The end closure pieces shall not come to the grille face.

Continuous grilles shall butt with hairline joints and be provided with interlocking splines.

All return air grilles shall be similar and equal to the above as determined by consultants.

All exhaust air grilles shall be similar and equal to the supply air grilles

Ceiling Outlets:

Square/Rectangular Diffusers:

Wherever specified in the BOQ shall be aluminum construction. Corners of inner and outer cores shall be assembled to provide precise mitered corners. Supply air diffusers shall be provided with multi blade butterfly dampers if specifically asked.

Installation of grilles/diffusers:

Installation of the grilles /diffusers shall be done by the air conditioning contractor irrespective of the type/model of false ceiling systems the diffusers will have to be individually suspended from the duct and aligned to match the ceiling line level. In case of gypsum any other ceiling system all wooden frames, rectangular or circular for supply/return/exhaust air diffusers will be provided by the Air conditioning contractor.

All air outlets/return air inlets in the same room shall be of the same size unless otherwise specified.

Grilles and diffuser samples must be submitted to the customer for prior approval before procurement and installation.

INSULATION:

Scope:

Scope of this Article comprises supply and installation of insulation as herein specified.

General:

All tests like light testing should be complete and recorded and all systems approved by the Consultants before insulation is applied to the equipment and piping. Insulation material shall be supplied by approved manufacturers and shall be of the type specifically intended for the services specified.

Refrigerant Piping:

Insulation Material:

Insulation should be Armaflex and of closed cell tubing type.

All pipes operating at temperature's lower than ambient shall be insulated with insulation of the following material. Any other material equivalent to above and approved by the Consultants.

Thickness of pipe insulation shall be minimum 9mm tubular Armaflex.

Clean the outer surface of refrigerant copper piping. Insert the pipes in tubular Armaflex. Join two ends of tubular Armaflex insulation using suitable adhesive. Tape the joints with masking tapes.

3A. Duct Thermal Insulation- Nitrile rubber:

Where ducts are to be insulated the same shall be carried out with the insulation material and thickness as under:

AIR	Location	Thickness mm	Insln. Material
Supply	Unconditioned Space	20	Factory laminated Aluminium foil faced Nitrile runbber with Acrylic tissue adhesive system.
Supply	Conditioned Space	9	- DO -
Return	Unconditioned	9	- DO -

3A.1 Technical Specifications of Insulation Material:

The material to be used shall be Physically (Electron Beam Irradiation) Nitrile rubber, closed cell with factory applied reinforced aluminium foil, satisfying the following

Specifications:

Factory applied Acrylic Adhesive Backing.

Density: 44Kg/m³

Thermal Conductivity: 0.032 W/mK @ 20OC.

Moisture Absorption: Non Hydroscopic.

Water Vapour Permeability: < 0.8gm/m²/24 hrs @ 90% RH, 38OC.

Operating temperature range: (-) 80O C to (+) 100O C.

Acoustic Insulation:

Coat interior of duct with shalikota primer. Fix 12mm thick resin bonded fiberglass Twiga 300 finished with RP tissue to duct using spot hot bitumen. Seal all joints with bitumen. The acoustic lining to be covered with RP tissue and perforated aluminum sheets of 30G thickness. The lining of aluminum sheet facing to be mechanically fastened to the duct with GI bolts/nuts & washers contractor to ensure a smooth internal finish.

All plenums, connecting pieces connected to air handling units and return air pieces shall also be acoustically treated.

There shall be a minimum of 75mm overlap between the acoustically and thermal insulation on ducts.

3.0 List of Approved Makes

Description	Makes
GI Sheet	Jindal / SAIL / TATA
Fibre glass	UP Twiga / Kimmco/ Backelite Hylam
Grilles / Diff. / Fire dampers	Ravi Star / Dynacraft / Caryaire / cosmic Airmaster
Volume Control Damper (G.I.)	RAVISTAR / DYNACRAFT / Caryaire / Airmaster/cosmic
Flexible Insulated Ducting	Sevenstar, Caryaire
Fire Damper	Caryaire / Ravistar / cosmic
Refrigerant Pipe Insulation	Armaflex
Hi-wall split AC	Carrier, Bluestar, Voltas,
Duct thermal insulation	Armacell, A-flex



Ranipet

SECTION IV

TECHNICAL SPECIFICATION OFFICE MODULAR FURNITURE & WORKSTATION

Section- IV : Technical specification for Modular furniture

1. Vendor should procure only the specified make of Godrej furniture as per BHEL rate contract and directly from Godrej.
2. Unit rates, Taxes and duties will be as per rate contract conditions.
3. Work of modular furniture supply and installation should be suitably interfaced with Godrej during refurbishment work.



Ranipet

SECTION V

TECHNICAL SPECIFICATION COMPUTER NETWORKING

Section – V: Technical specification for Computer Networking

1. Networking scope includes both internet and intranet connectivity for both D3 & D4 (BHEL Ranipet & BHEL Trichy).
2. Number of work stations envisaged presently is 8 nos. for D3 and 6 nos. for D4.
3. Scope of supply by the bidder includes supply and fixing of all networking passive components i.e., except network switches rack and router.
4. BOQ shown above is illustrative and bidder has to include all items to meet the general system requirements for intranet and internet connectivity from server to all the workstations/Printers and other hardware installed.
5. Taxes and duties extra should be specified separately.
6. Vendor should be registered for Works Contract Sales Tax otherwise WCST will be recovered from running bills.
7. Payment will be made after due certification of work.
8. Vendor should have executed similar types of works in the past for which details should be submitted by the bidder before award of work and also meet the general conditions of tender.
9. Length of cable is approximate only. Actual length has to be obtained by contractor before execution.



Ranipet

SECTION VI

TECHNICAL SPECIFICATION FIRE PROTECTION & ACCESS CONTROL SYSTEM

TECHNICAL SPECIFICATIONS

1.0 The scope of work shall cover supply, installation testing and commissioning of all conduit wiring.

1.1 STANDARDS

The following standards and rules shall be applicable

- 1) IS : 732 Code of Practice for Electrical wiring installation (System voltage not exceeding 650V)
- 2) IS : 1646 Code of Practice for fire safety of building (General) Electrical Installation.
- 3) IS : 1653 Rigid steel conduits for electrical wiring
- 4) IS : 2667 Fittings for rigid steel conduits for electrical wiring
- 5) IS : 3480 Flexible steel conduits for electrical wiring
- 6) IS : 3837 Accessories for rigid steel conduit for electrical wiring
- 7) IS : 694 PVC insulated cables
- 8) IS : 2509 Rigid non-metallic conduits for Electrical wiring
- 9) IS : 6946 Flexible (Pliable) non-metallic conduits for electrical installation
- 10) IS : 1293 3 pin plugs and sockets
- 11) IS : 8130 Conductors for insulated electric cables and flexible cord
- 12) IS : 9537 - Specification for conduits for Electrical installations
1980

b Indian Electricity Act 1910 and rules issued there under.

c Regulations for the electrical equipment in buildings issued by the Tariff Advisory Committee of the Insurance Association of India.

All standards and codes mean the latest

TECHNICAL SPECIFICATIONS FOR CONVENTIONAL FIRE ALARM SYSTEM

2.0 FIRE ALARM PANEL (FACP)

The Fire Alarm Panel (FACP) refers to the monitored Electronic or microprocessor-based multi zone panel that shall be connected to the various detector/devices by means of 2 wire. The FACP shall be able to supervise individual Zones for proper performance as well as to give zone wise location of fire alarm. The Panel shall meet IS 2189 or UL/LPCB Standards.

The Fire Alarm Panel shall be a 2 zone control panel which connects conventional devices such as manual call points, smoke detectors, sounders on a electrically supervised, two wire cable. Each zone shall generally connect upto 20 detectors/devices.

The panel shall provide Audio visual indication of the zone where a fault or a fire has occurred.

The panel shall provide visual indication for the following:

- a. System ON and healthy.
- b. Fault in any zone connected to this panel.
- c. Fire in any zone connected to this panel with double lamp arrangement.
- d. Low Battery indication

Necessary actuation contacts shall be provided to cut off AHU motors, fire dampers etc., in case of detection by any detector. The Fire Alarm Panel shall work on 230 Volts AC, 50 Hz 1 Phase. and when the power fails it shall work on batteries to maintain the system in operation for 48 hrs backup.

Each zone of the panel shall be capable of indicating 'Fire' (RED LED's) and fault (Open / Short) (Amber LED's) conditions.

It shall be able to withstand temperature variations from 0⁰ centigrade to 50⁰ centigrade. Further, Relative Humidity (non-condensing type) up to 95% shall not hamper its performance. The voltage rating shall be from 17V DC to 31V DC, though the voltage may be change depending upon the working voltages of a proprietary FACP.

The panel shall be provided with operating power from 240 V, 50 Hz single phase AC source. This power shall be converted into 24 V, DC for system operation by a power supply unit. In the event of failure of the operating supply, the system shall be automatically transferred to standby battery supply. The batteries shall be of the maintenance free type and shall be housed in an appropriate housing.

The batteries shall be kept fully charged by two rate charging automatic charge boost as well as trickle charging and shall have sufficient capacity to operate the system with A.C. power disconnected for 12 hours and at the end of this period to operate all alarm sounding devices simultaneously with loads caused by operation of detectors operating on 25% of the zone circuits of the system with a minimum of two zones for a period of 30 consecutive minutes. Interconnecting wiring between Fire Alarm Control Panel and batteries shall be supervised for open and short circuit conditions. Batteries shall also be supervised for an under voltage condition.

2.1 MULTISENSOR SMOKE DETECTORS

All detectors are fitted with plug-in system type connections, from the maintenance and compatibility point of views. An alarm release will not effect a detector's good functioning. After resetting the alarm, the detector will resume operations without readjustment of any kind.

The detector shall have a fast response over all types of fire. It shall be possible to use only a single detector type/model for both above and below false ceiling applications.

The detector shall be able to sense incipient fire by detecting the presence of visible and invisible products of combustion. The detector shall be suitable for low voltage (17 to 31V DC) two wire supply. The detector shall be provided with LED indication and the sensitivity of the detector shall not vary with change in ambient temperature, humidity, pressure or voltage variation.

It shall be able to withstand temperature variations from - 10 degree centigrade to 50 degree centigrade. Further, Relative Humidity (non-condensing type) up to 80% shall not hamper its performance. The voltage rating shall be from 17V -31V DC though the voltage may be changed depending upon the working voltages of a proprietary FACP.

The Detector shall have UL/FM/LPC approval.

2.2 HEAT DETECTORS:

Heat Detectors shall be of rate-of-rise cum fixed temperature type. These detectors shall be capable of detecting fire by responding to the rate of temperature rise in the surroundings and also when the temperature exceeds a preset value. The detectors shall operate when the rate of temperature rise is slow and yet the surrounding temperature has gone up beyond the preset value the detector should actuate.

Detectors shall be provided with LED to visually indicate the healthiness of the detector/alarm condition.

Detectors shall be suitable for an operating temperature 0° C to 55° C.

Each detector will be complete with an interchangeable mounting base that includes a terminal box into which the detector can be plugged in. Also there shall be an external terminal box to terminate the field cable. The base for the detector shall be from the same manufacturer of the detector and should be imported. These detectors/base shall be traceable to manufacturer's batch certificate.

Detectors shall be suitable for a supply voltage of 17 to 28 V DC without affecting the sensitivity.

The detectors shall have the approval of UL/LPCB/.

2.3 RESPONSE INDICATOR:

Response Indicator shall be of surface mounted with LED indication in MS sheet box.

RI shall light up as soon as one of the connected Fire Detectors, which are connected in parallel to the Response Indicator gives an alarm.

They shall be suitable for operation of 24 V DC.

2.4 MANUAL CALL POINT

The Manual Call Station shall be press to break resettable type. A Key shall be provided to test the Call point.

The device shall be moulded plastic, red in colour and suitable for surface or flush mounting. The manual station shall have normally open fire alarm and annunciator contacts and these contacts shall close on activation. Contacts shall remain closed until station is manually reset.

The voltage range shall be from 17V to 28V. The operating temperature range shall be from 0 degree C to 50 degree C. Relative Humidity (non condensing) range of performance parameters shall be between 0 to 95%. It shall meet BS 5839 and IS 2189.

2.5 SOUNDER

The sounder shall be electronic type and shall give discontinuous/ intermittent audible alarm whenever any detector or call box operates.

The sound output from the Hooter should be less than 20 decibels higher than the normal noise levels at the place of installation.

The sounder shall be powered from the panel and no separate power supply

It shall be capable of being directly mounted on the wall/ceiling and shall be activated in event of an alarm from FACP.

TECHNICAL SPECIFICATIONS FOR ACCESS CONTROL SYSTEM

3.0 TECHNICAL SPECIFICATIONS FOR ACCESS CONTROL SYSTEM

3.1 SCOPE

The scope of work under this head shall include design, supply, and installation of Access Control. The work under this system shall consist of design, supply, installation, testing, training & handing over of all materials, equipment's and appliances and labour necessary to commission the said system, complete with Access Controllers, Proximity Card Readers, Software, EM Locks, Exit Push Buttons, Door Position Sensors etc., for interfacing with other systems. It shall also include laying of cabling, necessary for installation of the system as indicated in the specification and Bill of Quantities. Any openings/chasing in the wall/ceiling required to be made for the installation shall be made good in appropriate manner.

This specification calls for the supply, installation and commissioning of a complete, Access Control System including: Access Control, Alarms Management in accordance with the technical and performance criteria set out in this document.

The system is to be supplied with all equipment, hardware, software, cabling and ancillary services as required to provide an integrated system complete and functional in all respects. The tenderers are to familiarise themselves with all matters related to such requirement and to account for such in the tendered price.

It is the responsibility of the tenderer to obtain clarification of all matters in which doubt exists as to the exact intent of this document or in which a conflict appears to have arisen. Such information must be obtained before the closing and lodging of tenders. The tenderer must include as part of the tender submission a complete, clause- by-clause response.

3.2 GENERAL REQUIREMENT

The Access Control System shall be used to serve the objective of allowing entry and exit to and from the premises to authorized personnel only. The system employed shall be based on Non contact proximity card type technology. Card Readers shall be used for entry control and exit control for all areas. The readers at each point shall be connected to individual Door Controllers shall be connected to a Network Server on a RS 485 network

Individual proximity type access cards shall be issued to all the employees. Each card will contain a site code (unique to the organisation) and a card number (unique to each card holder).

The system shall authorise entry only after the card is read by the proximity card reader (125 KHz) is validated with respect to door, time & day of the week. It shall also communicate the validity of the entry to the door for releasing the door lock. For authorising an exit, the system shall verify the validity of the card read by the smart card reader and release the door lock.

Each card shall be defined a specific access profile including valid doors, times and days of the week.

All card assignment information such as ID codes, authority levels, time periods etc., shall be processed directly through the existing Network Server. Each file record of the cardholder shall include name, department, designation, ID, valid door list and authorized time zones as minimum requirement.

Each access controller shall have its own power supply & battery back up for 8 Hrs. (Minimum)

3.3 DOOR CONTROLLER

Each access control point (door / barrier) shall be controlled by an access door controller that shall have its own power supply & battery back up for 8 Hrs. (Minimum). These controllers shall be capable of handling entry card readers for 4 doors or 1 door entry & exit readers or the combination of entry/exit readers for some doors & entry readers for the balance doors with exit switches.

The Door Controller shall incorporate at least 8-bit processor. The Door Controller software shall incorporate boot code in a protected sector of the flash memory. All system software can be downloaded over the network for upgrades from the central control.

The Door Controller shall operate from a separate DC power supply unit which will form a part of the door controller. The Door Controller shall continue to operate for at least 8 hours in the event of a mains supply failure. The system shall be capable of automatically detecting and reporting a power failure, low battery and battery not connected.

Door Controllers shall be fitted with "watchdog" hardware and software to enable them to restart and resume normal processing, should the processing system ever be corrupted.

The Door Controllers shall be such that in the event of failure of power or communications to the central control, for whatever reason, the system shall continue to allow or deny access based on full security criteria. The Door Controller shall contain all the security and access parameters to operate completely independently from the central control server.

The Door Controller shall "concentrate" activity data for immediate transmission to the central control PC. The Door Controller shall hold all access and cardholder data. The door controller shall be capable of holding up to at least 1,000 cardholder records.

During communications failure all access, valid or otherwise, and all alarm events shall be buffered at the Door Controller. The activity buffer shall be at least 5,000 events. The Door Controller shall transfer the buffered events to the central control automatically when the communications link is re-established.

Any failure of a card reader unit and its communications with the Door Controller shall immediately raise a high priority alarm in the PC and shall not cause the Door Controller or other units to stop or continue to allow or deny access correctly on the other working card readers.

The system shall separately monitor all enclosures to detect tampering and also report low supply voltage conditions. The Door Controller shall include tamper protection for the front and the back of the panel. The front panel shall be tamper protected for door open, and the rear of the panel to detect if the panel has been removed from the wall.

The Door Controller shall check entry or exit based on ALL of the following criteria

Correct facility code

Authorized card in database

Correct card number

Authorized door / access zone

Authorized time of day

Double entry (anti-pass back).

Any Cardholder entering an "anti-pass back zone" controlled by a reader must exit from that zone by presenting their card to an exit reader.

The system shall include an optional "anti-pass back" feature to allow Cardholders to re-enter the zone after a user-defined, pre-set time period has expired.

Each reader shall be capable of automatically switching the access mode at a door at different times of the day, based on control parameters received from the central control. The following access criteria modes are minimum that shall be met by the Access Control System:
Free access - Door is unlocked, no card entry required.

Secure access - Door is locked, a successful card attempt is required for valid entry. Door re-secures after access attempt.

The Door Controller / software shall have in built door interlock logic provision.

Door Controller shall be capable of transmitting all Alarm Messages to the central PC Server in plain text. The following are the minimum alarms that are required to be transmitted & logged.

Tamper

Tamper Return to Normal

Unit Stopped Responding

Card error

Maintenance Warning

Card Trace

Access Denied

Duress

Door Open Too Long

Forced Door

Door not locked

Power Failure

System Reboot.

3.4 PROXIMITY READER

The card reader shall be of proximity technology. The card readers shall be of high reliability, consistent read range characters, low power consumption and easy to install. The card readers for the doors shall have a read range of min 2 inches. They shall include multi colour LED to indicate normal/pass status.

The reader shall be sealed in a rugged weatherised polycarbonate vandal resistant enclosure designed to withstand harsh environments as well as providing high degree of vandal resistance for both indoors or outdoors. The Reader shall be connected to the controller on a interface to meet the site requirements.

The reader shall be compact and shall be suitable for indoor & outdoor operation from 0 to 50°C at operating humidity of 10% to 95% non-condensing. The reader shall be UL Listed with FCC certification.

3.5 PROXIMITY CARD

The proximity card shall incorporate radio frequency identification electronics into a thin, durable polycarbonate package of not more than 2-3 mm. ISO size cards (Standard credit card size). The card shall be thin and flexible enough to be carried in a wallet. It shall have extremely consistent read range that is not affected by body shielding, environmental conditions and when close to metal objects. It shall be possible to print the card details directly on the card using a Card Printer.

The card encoding format shall be so designed that additional cards can be ordered at a subsequent data without upgrading firmware in the existing readers. The card shall offer passive and no battery designed allowing an infinite number of reads.

All Proximity cards shall be passive. The card data system shall be specially designed for the use only on this project. The card number shall not be the card serial number, it must be a number specifically coded onto the card. The access card shall contain a unique facility code; unique cardholder identification number the access card shall uniquely identify the cardholder to the access control system.

Access control information shall be stored on or in the access card in an encrypted manner. During transmission of data between a proximity access card and a proximity reader, the data shall be encrypted. All access control encoding data shall be invisible to the naked eye. There shall be barriers employed to prevent the deciphering of access control data stored on the card using any readily available equipment. Used. There shall be barriers employed to prevent the copying or altering of access control data stored on the card using any readily available equipment

3.6 ELECTRO MAGNETIC LOCKS

The magnetic lock shall consist of a magnet mounted onto door frame and a steel plate attached to the top of the door. The door shall be strongly closed when the magnet is energized with the steel plate bonded to it. Instant release shall be possible when power supply is cut off, providing fail safe operation. The door controller shall control the EML. The EM Lock shall be suitable for mounting single, double, flush, swing type, metal, glass, wooden doors with (or) without frames. The Vendor shall consider the required mounting accessories for the above in their lock cost. The EM Lock shall have a minimum holding force of 600 Lbs.

3.7 SOFTWARE

The Access Software on the Network Server software shall be a window application program capable of working in the background, to permit MS Office and such other software to be used simultaneously

The Server Software shall be able to communicate with the controllers and if necessary to central server as required.

The application software shall mean the access, management software that shall be supplied together with the system in order to provide a Graphical user Interface (GUI) for man – machine interface. GUI shall also have the feature of adding photo ID of the employee in the future.

The Server Software shall have the option to be web enabled with respect to select functions such as “Locate User”. It shall be possible to integrate multiple server installations on LAN to Master when the application involves more than one server to be installed at site. A separate add – on software module shall be available for time & attendance management functions apart from the access control application.

The software shall have fully assignable multi level password access control and definable passwords for each operator as described in detail elsewhere. The software shall provide control on the system as a whole and shall also provide a variety of reports including investigative reports by Date, Door and card. The software should also be able to locate a cardholder in the premises.

Invalid alarms shall be generated for any invalid card usage. This shall be clearly distinguished by appropriate messages as to whether they are due to invalid site code, invalid card number, invalid issue level, invalid time zone, anti-pass back error, voided card etc., The alarms may be enabled or disabled at the Network Server. If enabled the operator may choose auto/manual reset.

Facility shall exist in the system to assign master cards which shall be granted access to all doors at all times without any restriction. Facility shall exist to allow an operator to void out a lost card and the voided card report shall be included in the Void Card report.

The system shall be capable of identifying a forced door entry and record the same as an alarm event.

The access management software shall have a menu driven display and shall facilitate configuration, control, and communication and Report generation.

It shall provide facility for maintaining information of cards like card number, name, designation, department, etc. The software shall have at least 100000 card capacities.

The software shall have provision for handling cardholder details pertaining to departments from a list of user definable department names.

When the card profile is created by the operator in the PC software, the profile shall be downloaded to the door controllers only after the profile is authenticated by another superior.

The software shall have the facility to name the doors.

It shall facilitate downloading the system configuration like system date and time, card settings, time zone settings, pin settings, door groups, system events, card events, alarm events.

It shall be possible to program special cards for visitors and contractors. The valid time period for these cards shall be defined.

The system shall identify cards as Employees, Master User, Visitor, Contractor, Duress Maintenance staff etc. & provide appropriate fields for entering relevant information in the database. The database shall allow adequate number of fields for storing all data relevant to the cardholder. Date & time shall define the validity of each card issued on the system.

It should be possible to manage and monitor alarms, overrides, the general status of site items and open doors through the Graphical User Interface with the use of interactive real time dynamic site plans and icons

The following functions should, as a minimum, be able to be executed by clicking on a Site Plan icon by the authorized operator:

View the current status of a Door, Input or Output.

Monitor and acknowledge an Alarm

Open & Shut any access controlled door or group of access controlled door.

Override an alarm or access zone state.

The system shall automatically log all access control events, alarms, activity events and operator actions within the system. The system shall report all events to the operator(s) as configured and shall produce and maintain a log of all system events, alarms and Operator actions. The system shall provide a means for an operator to extract information relative to the event log and system configuration and produce this information in the form of printed reports, screen displays or ASCII files.

The software shall display a one-line plain language event message for every activity event (alarm or otherwise) occurring in the system. All activity logged shall be time and date stamped to the nearest second (hh:mm:ss). On having the appropriate operator authorization it shall be possible to drill down into the properties of each component that makes up that event for future details. This includes but is not restricted to the following items:

All card access attempts, successful or otherwise (unsuccessful attempts shall state the reason for the denial)

All door alarms, all operator activity including log on, log off, alarm response messages and any alteration of system data files & all alarm monitoring activations & all communications link failures Comprehensive backup and archiving facilities shall be incorporated as an integral part of the system software.

A facility shall be provided in the system to allow for the real-time export of any alarm and event information to third party systems via customizable strings.

It shall include comprehensive report facilities of on line activities and a permanent record of cardholder activity.

It shall be possible to grant or deny access to individual/set of cards to selected secure areas. This function shall be done only by authorised operators. The software shall have provision for unlimited operators.

It shall be possible to provide timed cards. The cards shall have a start and end date validity period and upon expiry of the validity period, cards shall become automatically invalid without operator intervention.

It shall provide emergency and remote door operations which can be used to control the door status like locking or unlocking of all the doors in case of an emergency.

The system shall also lock or unlock all the doors for a selected time period.

It shall provide a backup and purge operation that shall perform a backup of all the current events & archive the same month wise.

The software shall also provide an archive which permits to load backed-up database.

It shall provide reports by Name, by Card, & by card type, (Employee, Visitor, Contractor etc.,).

It shall provide investigation reports to generate event and activities pertaining to card, system operator and alarms according to the given specification with respect to date and time.

The software shall have atleast 3 levels (1, 2, and 3) of access for the various functions.

Each Card shall be programmed for many Card Feature such as Trace a card, Disarm Alarm Inputs, premises Custodian, Asset Release, Transaction Limit, Escort etc.,

Each door controller shall be capable of programming for the Free Open for a specific time, Lock from central command (Excluding Master User), Lock for all (Excluding Duress), Soft, Timed, Logical, Global Anti – Pass Back, Maintenance Mode etc.,

The system shall have anti-pass back feature to prevent an authorised cardholder passing his card back to an unauthorized user. Once a card is logged as IN on a specific door, the system shall not provide entry to the same card again, unless the card logs OUT. An ENTRY shall be preceded by an EXIT & vice-versa.

This shall be a selectable feature and the user shall have the option of specifying the doors that shall have anti-pass back.

It shall be possible to issue manual keyboard command from the Network Server to lock or unlock any individual door momentarily or permanently, until normalised.

3.8 EMERGENCY RELEASE BOX

The emergency release box shall be resettable press to open glass type, similar to a resettable manual call point and shall be green in colour. In case of any emergency, the plastic facia in the box shall be pressed to cut-off the power supply to the electro magnetic lock. A key shall be used to reset the Release Switch Box to normal close position. There shall not be any need to change the glass for every operation.

3.9 CABLES

Cabling between UPS point to the Controllers etc., shall be in the scope the Vendor. The 8 core 0.75 Sq mm cable connecting the readers, EM Locks, Door Sensors shall be PVC insulated copper, multi strand, Shielded cables shall be 650V grades and shall generally confirm to IS – 1554 – 1988 and meet the signal cabling requirement of the system manufacturer.

The 4 core 0.75 Sq mm networking cable connecting the door controllers shall be PVC insulated copper, multi strand, Shielded cables shall be 650V grades and shall generally confirm to IS – 1554 – 1988 and meet the signal cabling requirement of the system manufacturer.

TECHNICAL SPECIFICATION FOR SPRINKLER SYSTEMS

4.0 GENERAL INSTRUCTIONS

4.1 SCOPE

The scope of work under for this Tender shall include design, supply, installation, testing, commissioning, training & handing over of the Sprinkler System.

4.2 SPRINKLER HEADS

Conventional type sprinkler shall be provided for both above false ceiling and below false ceiling. Stainless steel escutcheon plate shall be provided for the sprinklers installed below false ceiling area. The sprinklers shall have approval of UL.

Sprinkler heads shall be made of brass/quartzoid bulb sufficiently strong, in compression to withstand any pressure, surge or hammer likely to occur in the system. The yoke & body shall be made of high quality gun metal brass with arms streamlined to ensure minimum interference with the spread of water. The deflector of suitable design shall be fitted to give even distribution of water over the area commanded by the sprinkler.

The bulb shall contain a liquid having a freezing point below any natural climatic figure and a high co-efficient of expansion. The temperature rating of the sprinkler shall be stamped on the deflector & the colour of the liquid filled in the bulb shall be according to the temperature rating as per NFPA standard.

Sprinklers shall not be reconditioned or repaired. Used and/or defective sprinklers shall be replaced by new ones.

Sprinkler shall not be painted for the identification purposes.

4.3 OPERATING TEMPERATURE

The Operating Temperature at which the quartzoid bulb of the sprinkler head shall actuate, shall be 68 degree C or as specifically mentioned.

4.4 SPRINKLER INSTALLATION

Sprinkler heads shall be located in positions shown on the drawings. While Slight relocation may result from building construction features or interference from other services, the maximum spacing between sprinkler heads and coverage area shall not exceed those stipulated in the TAC regulations and the NFPA 13-1994 Rules.

Allowance shall be made for such relocations within a radius of 1500mm of the indicated positions without additional cost. The fire protection services trade shall co-ordinate with the ceiling trade to set out the sprinkler locations to suit the site location of the unit grid. In general, all sprinklers shall be located at the centre of the ceiling unit and a provision of about 10% more sprinklers and pipe work than required in TAC and NFPA Rules shall be included in this sub-contract.

4.5 FLOW REQUIREMENTS

The Flow requirement for sprinkler heads shall be specifically approved for the designated area of installation.

4.6 PRESSURE GAUGE

Pressure gauge sensing elements shall be of continuous 'C' bourdon type. Gauges shall be of 150 mm diameter dial stored enamel black finish case. Normal process pressure shall be gauged within 70% of full scale reading of the scale range. Accuracy shall be within 1.0 % of full scale range. Gauges shall have internal and external stop pegs for cover range protection of 125% of maximum range and zero point respectively. All gauges shall have bottom connection for local mounting. All gauges shall be provided with 3 way gauge isolation valve or lock union nut, with nipple and tail pipe, wherever required.

4.7 FLOW SWITCH

Flow switches shall be mounted in each branch taken from the riser to detect the flow of water. It shall be mounted in a horizontal section of pipe where there is a straight horizontal line of at least 10 pipe diameter on upstream side and 5 pipe diameter on down stream side of the flow switch. Flow switch shall accommodate a micro switch with at least 2 NO and 2 NC contacts and the same shall be actuated by metallic bellows sealed pivoted paddle. The instrument shall be weather proof with IP52 when the cover and suitable cable gland are properly fixed. The flow switch shall be suitable for mounted on 100 – 150 mm dia pipe line. The flow switches shall be provided for sprinkler system.

Flow switch shall have a paddle made of flexible and sturdy material of the width to fit within the pipe bore. The terminal box shall be mounted over the paddle/pipe through a connecting socket. The switch shall be able to trip and make/break contact on the operation of a single sprinkler head.

The flow switch work at a triggering threshold band width (flow rate) of 4 to 10 GPM. Further, it shall have a 'Retard' to compensate for line leakage or intermittent flows.

4.8 PIPING

- i. a For pipelines, welded construction shall be adopted unless specified otherwise.
 - ii. b Hangers and supports shall be capable of carrying the sum of all concurrently acting loads. They shall be designed to provide the required supporting effects and allow pipe lines movements as necessary. Approval to the type of hangers and components for all piping selected by contractor shall be obtained from the Employer before commencement of work.
 - iii. c All piping system shall be capable of withstanding the maximum pressure arising from any condition of testing (as stipulated) and operation, including water hammer effects.
 - iv. d While erecting field run pipes, the contractor shall check the accessibility of valves, instrument tapping points, and maintain minimum head room requirement and other necessary clearance from the adjoining work areas.
- b. Modification of prefabricated pipes, if any, shall have to be carried out by the contractor at no extra charge to the Purchase/Employer.
- c. All pipelines shall be given proper slope towards the drain point.

- d. External and internal attachment to piping shall be designed so as not to cause flattening of pipes of excessive localised stresses.
- e. All pipe lines shall be identified by means of colour bands and direction arrows in consultation with the Architect.

4.9 END PREPARATION

- a. For steel pipes, end preparation for butt welding shall be done by machining / flame cutting.
- b. Socket weld end preparation shall be by machining.

For tees, laterals, mitre bends and other irregular details cutting templates shall be used for accuracy.

4.10 PIPE JOINTS

- a. In general, pipes having sizes 50 mm and over shall be joined by butt welding, pipes having 40 mm size or less shall be joined by socket welding/screwed joints shall have tapered threads and shall be assured of leak tightness without using any sealing compound.
- b. Flanged joints shall be used for connection to vessels, equipment, flanged valves and also on straight lengths of pipeline at strategic points to facilitate erection and subsequent maintenance work.

4.11 OVER GROUND PIPING

Piping to be laid over ground shall be supported on supports. Support details shall have to be approved by the Employer/Project manager/Consultant

4.12 PAINTING

Above ground pipes shall be coated with one coat of red oxide primer and 2(two) coats of synthetic enamel of 'Fire Red' colour. The pipe line surfaces shall be manually cleaned of rust / mill scales by wire brush, carborandum tips etc., Use of Whipping hammer, emery paper shall be done to clean pitted areas.

4.13 WELDING

- a. Before welding, the ends shall be cleaned by wire brushing, filing or grinding. Each weld-run shall be cleaned of slag before the next run is welded.
- b. Welding at any joint shall be completed uninterrupted. If this cannot be/ followed for some reason, the weld shall be insulated for slow and uniform cooling.
- c. Welding shall be done by manual shielded metal arc process using the right electrode.

- d. As far as possible welding shall be carried out in flat position. If not possible, welding shall be done in a position as close to flat position as possible.
- e. The root of butt joints shall be such as to achieve full penetration with the complete fusion of root edges. The weld projection shall not exceed 3 mm inside the pipe.
- f. On completion of each run crater, weld irregularities, slag etc., shall be removed by grinding or chipping.
- g. During the process of welding, all movements, shocks, vibration or stresses shall be carefully avoided in order to prevent weld cracks.

4.14 PRESSURE TESTING

After the entire pipe line is erected, the pipe line shall be subjected to a hydrostatic test at 1.5 times the working pressure for a period of 2 (Two) hours. The test should be made in the presence of and to the satisfaction of the Employer's / Consultant's representative. Defects noticed in the test should be repaired or if necessary defective work should be replaced with new work. Tests shall be repeated until work is done satisfactorily.

4.15 DISCHARGE TEST

The sprinkler bulb shall be heated & checked for discharge. A test sprinkler along with ball valve shall be provided in one toilet core in each floor. The water discharge is checked & the auto start of the pumps are also checked.