

**SPECIAL CONDITIONS****1.1 GENERAL**

1.1.1 The following conditions shall be read in conjunction with General Conditions of Contracts IAFW-2249 (1989 Print) and IAFW-1779-A including errata and amendments thereto.

1.1.2 If any provision in these special conditions is at variance with the provisions of the above mentioned documents, provisions in these special conditions shall be deemed to take precedence there over.

**1.2 VISIT TO SITE**

The tenderer is advised to inspect the site, by prior appointment with the Garrison Engineer, to ascertain the nature of site, access thereto, local facilities for procurement of materials, working hours and labour rates prevalent in the area and all other matters affecting his price in the tender for execution and the completion of the work. The tenderer shall be deemed to have full knowledge of the site (s) whether or not he actually visits it/these. For the purpose of collection of materials and execution of the works, the site will be considered as lying in area as mentioned in clauses hereinafter.

**1.3 SECURITY AND PASSES**

1.3.1 Tenderers attention is invited to condition 25 of IAFW-2249. He shall employ only Indian Nationals after verifying their antecedents and loyalty. He shall ensure that no person of doubtful antecedents and nationality is, in any way, associated with work. If for reasons of technical collaboration or other consideration, the employment of any foreign national is unavoidable, the Contractor shall furnish full particulars to this effect to the Accepting Officer at the time of submission of his tender. The Contractor shall on demand by the Engineer-in-Charge, submit a list of his agents, employees and work people concerned and shall satisfy the Engineer-in-Charge as to the bonafide of such people.

1.3.2 The Engineer-in-Charge shall, at his discretion has the right to issue passes, as per rules and regulations of the installation/area in force, to control the admission of the Contractor, his agents, and employees and work people to the site of the work or any part thereof. Passes shall be returned on any time on demand by the Engineer-in-Charge or the authorities concerned and in any case on completion of work.

1.3.3 The Contractor and his agents, employees and work people shall observe all the rules promulgated by the authority controlling the installation/area in which the work is to be carried out e.g. prohibition of smoking and lighting, fire precautions, search of persons at entry and exit, keeping to specific routes, observing specified timings etc. Nothing extra shall be admissible for any man hours etc lost on this account.

**1.4 MATERIALS AND SAMPLES**

1.4.1 Refer condition 10 of IAFW-2249 and clause 1.6 & 1.7 of MES Schedule.

1.4.2 Materials provided by the Contractor for incorporation in the works shall, unless otherwise specified in the particular specifications be ISI marked. IS means Indian Standards as issued by the Bureau of Indian Standards. Wherever in the specifications 'IS' is referred to, it means the edition with all amendments, current on the due date of receipt of the tender documents.

1.4.3 The tenderer is advised to inspect other materials, which are displayed in the office of the GE, before submitting his tender. The tenderer shall be deemed to have inspected the samples and satisfied himself as to the nature and quality of materials, he is required to incorporate in the work irrespective of whether he has actually inspected them or not. The materials to be incorporated in the work by the Contractor shall be ISI marked or shall be equal or superior in quality to sample displayed and shall comply with the specifications given hereinafter.

1.4.4 The Contractor shall produce samples of all materials, articles, fittings, accessories etc. that he proposes to use and get these approved in writing by the Garrison Engineer within reasonable time from the date of commencement of work as per work order. The materials, articles, etc. as approved, shall be labelled as such and shall be signed by the GE and the Contractor's representative. These samples shall be kept in the custody of the Garrison Engineer/Engineer-in-Charge.

1.4.5 The Contractor shall not procure materials unless the samples are first got approved by the Garrison Engineer. All items/materials for which approval is obtained from the GE shall be recorded in MBs as 'Not to be abstracted'

1.4.6 The brand of all materials, articles, fittings, etc. approved together with the names of the manufacturers and firms from which supplies have been arranged shall be recorded.

1.4.7 (a) It is mandatory that ISI certified marked items/articles shall be incorporated in the work.

(b) The Govt. reserves the right to get any items/articles tested in approved laboratories. The cost of sample for testing shall be borne by the Contractor and the remaining expenses such as cost of transportation of sample to laboratory and testing fee shall be borne by the Govt., if the test result is found to be satisfactory. However, in the event of the test result being found unsatisfactory, the entire cost of testing including cost of sample shall be borne by the Contractor. The Government may get more than one sample of the same materials tested and the cost of such testing shall be borne by the Government.

1.4.8 In case of conflicting provisions regarding makes in schedule 'A', particular specifications, Appendix 'A' the following order of precedence shall be followed:-

- (a) Schedule 'A'
- (b) Particular specifications
- (c) Appendix 'A'

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**SPECIAL CONDITIONS Contd...****1.5 PROPRIETARY/ BRANDED MATERIAL**

**1.5.1** Proprietary/branded materials such as paints, chemicals for anti-termite treatment, bitumen, waterproofing compound etc, quantity of which cannot be checked after incorporation in the work, shall when collected at site, be recorded in measurement book and signed both by the Engineer-in-Charge and the Contractor as a check to ensure that the required quantity has been brought at site for incorporation in the work.

**1.5.2** Materials brought to site shall be stored as directed by the Engineer-in-Charge and those already recorded in measurement book shall be suitably marked for identification.

**1.5.3** The Contractor shall obtain proprietary/ branded materials from manufacturers or from manufacturer's authorised stockists where such authorised stockist has been appointed. The Contractor shall, on demand, produce original receipted vouchers/ invoices of suppliers to the Garrison Engineer, to ensure that the Contractor has actually brought the required quantity of the materials from the authorised dealers/manufacturers and also to be find out the rates thereof. The original vouchers/ invoices shall be defaced and stamped by the Engineer-in-Charge, indicating contract number, name of work, under his dated signature. The Contractor shall ensure that the materials are brought to site, in original sealed containers/ packing bearing manufacturer's marking except in the case of the requirement of material(s) being less than the smallest packing.

**1.5.4 PRODUCTION OF VOUCHERS** Contractor shall produce purchase vouchers from the manufacturers and/or their authorised agents for the full quantity of following materials to the Garrison Engineer, as applicable as a prerequisite before submitting claims for payment for advances on account of the work done and/or materials collected in accordance with condition 64 of General Conditions of contracts (IAFW-2249). The Garrison Engineer shall check the same before making RAR payment against these items. Production of purchase vouchers for these items is mandatory. The Garrison Engineer shall not make payment against the items listed below in RARs unless the purchase vouchers for the same have been produced to him and verified by him:

- (a) Water proofing compound
- (b) Chemicals for anti-termite treatment
- (c) Paints
- (d) All proprietary articles
- (e) Bitumen for road work
- (f) Air blown grade bitumen for water proofing work
- (g) Cement
- (h) Steel
- (j) Any other material used in the work, if demanded by **Engineer-in-Charge**

**1.5.5** The vouchers shall be endorsed, dated and initialled by the Engineer-in-Charge giving the contract number and name of work. A certified copy of each of such vouchers signed both by the Engineer-in-Charge and the Contractor shall be kept on record.

**1.5.6 TESTING OF MATERIALS** (Refer Condition 49 of IAFW-2249, General Conditions of Contracts)

**1.5.7** The contract shall provide at his own expenses all facilities including labour, materials, equipments, tools and plants etc. for carrying out tests including materials/tests, cubes, beams etc. required to be preserved by GE as specified in the contract agreement including relevant IS. The cost of materials consumed in test and the cost/charges of test shall be borne by the contractor in all cases. In case the Engineer-in-Charge desires to carryout additional test which are not covered by the contract including relevant IS, the contractor shall provide all facilities required for the purpose and the charges for the tests also shall be borne by the contractor. Charges for each test either conducted in the department test laboratory or test which are conducted through other test labs shall be born by contractor.

**1.5.7.1** NATIONAL TEST HOUSE/ ENGINEERING COLLEGE/SEMT PUNE: Any of the National Test House/Engg College/SEMT Pune nominated by the GE in writing for a particular contract and test.

**1.5.7.2** Contractor shall provide all facilities such as materials and labour, tools/equipment for moulding, casting of cubes, conveyance of test cubes and other materials to be tested, to the laboratory directed by the GE/Engineer-in charge.

**1.6 TIME AND PROGRESS (CPM CHART)**

**1.6.1** The CPM Chart to be prepared as per Condition 11 of IAFW-2249 (General Conditions of Contracts) shall consist of detailed net work analysis and a time Schedule. The critical path net work will be drawn jointly by the Garrison Engineer and the Contractor soon after acceptance of the tender. The Contractor so as to finish the work within the stipulated time will do the time scheduling of the activities. On completion of the time schedule, firm calendar date Schedule will be prepared and submitted by the Contractor to the Garrison Engineer who will approve it after due scrutiny. The Schedule will be submitted in four copies within two weeks from the date of handing over the site.

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**SPECIAL CONDITIONS (Contd...)**

- 1.6.2** During the currency of the contract, the Contractor is expected to adhere to the time schedule and this adherence will be a part of the Contractor's performance under this contract. During the execution of work, the Contractor is expected to participate in the reviews and updating of the net work undertaken by the GE. These reviews may be undertaken at the discretion of the Garrison Engineer either as a periodic appraisal measure or when the quantum of work ordered on the Contractor is substantially changed through deviation orders or amendments. Any revision of the time schedule as a result of the review will be submitted by the Contractor to the Garrison Engineer within a week for his approval after due scrutiny. The Contractor will adhere to the revised schedule thereafter. In case of the Contractor disagreeing with the revised schedule the same will be referred to the Accepting Officer, whose decision will be final, conclusive and binding. Garrison Engineer's approval to the revised schedule resulting in a completion date beyond the stipulated date of completion shall not automatically amount to a grant of extension of time.
- 1.6.3** Extension of time shall be considered and decided by the appropriate authority mentioned in condition 11 of IAFW-2249 and separately regulated.
- 1.6.4** The Contractor shall mobilise and employ sufficient resources to achieve the detailed schedule within the broad frame work of the accepted methods of working and safety.
- 1.6.5** No additional payment will be made to the Contractor for any multiple shift work or other intensive methods contemplated by him in his work schedule, even though the department approves the time schedule.
- 1.7** **SECURITY OF CLASSIFIED DOCUMENTS**  
The Contractor's special attention is drawn to condition 2-A and 3 of General Conditions of Contracts (IAFW-2249). The Contractor shall not communicate any classified information regarding the works either to sub-Contractors or others without prior approval of the Engineer-in-Charge. The Contractor shall also not make copies of the design/drawings and other documents furnished to him in respect of the works and he should return all documents furnished to him in respect of the works on completion of the work or earlier termination of the contract. The Contractor shall along with the final bill, attach a receipt from the Engineer-in-Charge in respect of his having returned the classified documents as per condition 3 of General Conditions of Contracts (IAFW-2249).
- 1.8.** **MINIMUM WAGES PAYABLE**
- 1.8.1** Refer Conditions 58 of IAFW-2249. The "Schedule of Minimum Fair Wages" as published vide Govt. of India Notification dated 10 Mar 92 (revised upto date) forms part of the tender documents. The contractor shall not pay wages lower than minimum wages for labour as fixed by the Govt. of India/State Govt. under Minimum Wages Act or Contract Labour (Abolition and Regulation Act), whichever is higher.
- 1.8.2** The fair wage referred to in condition 58 of IAFW-2249 will be deemed to be the same as the minimum wages payable as referred to above.
- 1.8.3** The contractor shall have no claim whatsoever, if on account of local factors and or regulations, he is required to pay the wages in excess of minimum wages as described above during the execution of work.
- 1.9** **PERIOD FOR KEEPING TENDER OPEN**  
The tender shall remain open for acceptance for a period of 60 (Sixty) days from the date specified for its submission.
- 1.10** **QUALIFIED TRADESMEN**  
In compliance with the condition 26 of IAFW-2249 (General conditions of contracts), the contractor shall employ skilled/semi skilled tradesmen who are qualified and possessing certificate in particular trade from Industrial Training Institute (ITI) / National Institute of construction Management and Research (NICMAR)/Similar reputed and recognised Institutes by State/Central Government to execute the works of their respective trade. The number of such qualified tradesmen shall not be less than 25% of total skilled/semi skilled tradesmen required in each trade. The contractor shall submit the list of such tradesmen alongwith requisite certificates to GE for verification and approval. On verification of documents of such tradesmen, GE shall render a certificate to this effect to CWE as well as Accepting Officer. Notwithstanding the approval of such tradesmen by GE, if the tradesmen are found to have inadequate skill to execute the work of their trades, leading to un-satisfactory workmanship, the contractor shall remove such tradesmen within a week after written notice to this effect by the GE and shall engage other qualified tradesmen after prior approval of GE. GE's decision whether a particular tradesmen possesses requisite qualification, skill and expertise commensurate with nature of work, shall be final and binding. No compensation whatsoever on this account shall be admissible
- 1.11** **ROYALTIES** Delete the existing condition 14 of IAFW-2249 and insert the word "BLANK" in lieu.
- 1.12** **LAND AND LABOUR ACCOMMODATION, AND STORES AND WORKSHOP ETC.**
- 1.12.1** Delete lines 5 to 9 of Para 1 of Condition 24 of General Conditions of Contracts IAFW-2249 i.e. from "In the event of area of land" to "land allotted to him" and insert as under: "The Contractor shall be allotted, the area as marked on the layout plan for the purpose of erection of temporary workshop, stores for which he shall pay the nominal rent of Re.1/- per year or part of a year. No MD land is available for accommodation of labour and canteen in restricted area for which the Contractor shall make his own arrangement at his own expense."
- 1.12.2** The Contractor will not be allowed to quarry/ win earth from MD land.

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**SPECIAL CONDITIONS Contd...****1.13 CO-OPERATION WITH OTHER AGENCIES**

- 1.13.1** The Contractor shall permit free access and generally afford reasonable facilities to other agencies or departmental workmen engaged by Government to carry out their part of the work, if any, under separate arrangements.
- 1.13.2** The Contractor's prices shall be deemed to cater for all the above contingencies and nothing extra shall be admissible on this account.

**1.14 LABOUR (REGULATION & ABOLITION) ACT**

- 1.14.1** Contract labour (Regulation & Abolition) Act 1970 is applicable to MES Contractors. Rates quoted by the tenderer shall be deemed to take into account the cost, etc., required to comply with the provisions contained in the said act and the rules framed under the said act.
- 1.14.2** Refer Condition 58 of IAFW-2249. The "Schedule of Minimum Wages" as published vide Govt. Of India Notifications, as available on date of receipt of tender forms part of these tender documents. However, the Contractor shall not pay wages lower than minimum wages for labour as fixed by the Govt. Of India/ State Govt/ Union territory under Minimum Wages Act or Contract Labour (Abolition and Regulation Act), whichever is higher.
- 1.14.3** The fair wages referred to in condition 58 of IAFW-2249 will be deemed to be the same as the minimum wages payable as referred to above.
- 1.14.4** The Contractor shall have no claim whatsoever, if on account of local factors and/or regulations, he is required to pay the wages in excess of minimum wages as described above during the execution of work.

**1.15 WATER SUPPLY**

- 1.15.1** Refer condition 31 of General Conditions of Contracts (IAFW-2249) and clause 1.13 of MES Schedule.
- 1.15.2** Water will NOT be supplied by the MES & the Contractor shall make his own arrangements for water for the entire work. However, the Contractor if he so desires, will be permitted to drill bore well(s) in the area at his own cost. The well(s) dug/drilled by the Contractor shall become the property of the Govt. without any extra cost. The Contractor shall at his own cost, get the water tested from recognised Govt. Laboratory about the portability of water and produce the certificate to the GE.
- 1.15.3** Water used for mixing and curing shall be generally potable water, clean and free from impurities viz. oils, acids, alkaline salts, sugar, organic materials or other substance that may be deleterious to concrete or steel and also conform to IS-456.

**1.16 ELECTRIC SUPPLY**

- 1.16.1** In the case the Contractor desires to buy electricity from the MES and if the same is available for supply with the department he shall be charged for the electric energy consumed at the following rates:  
(a) At Rs.10.88 per unit for lighting and  
(b) At Rs. 10.88 per unit for power
- 1.16.2** Electric supply required for works shall be made available by the MES at the points marked on site plan. The main switch and kWh meter to register the electric energy supplied shall be provided and installed by the MES. The Contractor shall provide all necessary connections, cables, fittings etc. from main switch in order to ensure a proper and suitable supply of electricity for the execution of work.
- 1.16.3** MES do not guarantee availability/continuity or supply of full quantity of electricity as required/demanded by the Contractor. The electricity shall be supplied to the extent available with the department. No compensation whatsoever shall be allowed for supply becoming intermittent or for break down in the system.
- 1.16.4** The GE or his representative shall be free to inspect all the power consuming devices or any electric lines provided by the Contractor. Any devices or electric lines provided by the Contractor, which are not to the satisfaction of the GE shall be disconnected from the supply, if so directed by the GE.

**1.17 RELEASE OF ADDITIONAL SECURITY DEPOSIT**

- Additional security deposit when deposited by the Contractor as per clause 22 of IAFW-2249 shall be released in two stages as under:
- (a) 50% additional security deposit shall be released on payment of final bill provided there are no claims outstanding against the Contractor in respect of the contract in which the additional security is lodged and the final bill is not minus. In the event of Department's claims against the Contractor and/or the final bill being minus, the amount of the security deposit shall be adjusted against the claims due to Government and the balance, if any, will be released to the Contractor.
- (b) Balance 50% of the additional security deposit will be released to the Contractor after the expiry of defect liability period as per condition 68 of IAFW-2249.
- (c) In order to implement the above procedure the Contractor is advised to deposit the additional security in two equal parts so as to facilitate its release.
- (d) The above clause is not applicable for release of Earnest Money/Security Deposit deposited by a Contractor who has not executed the Standing Security Bond with the department.

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**SPECIAL CONDITIONS Contd...****1.18 MINOR CONSTRUCTIONAL DETAILS**

Unit rates / lump sum quoted by the Contractor shall be deemed to allow for all minor constructional details which are not specifically shown on drawings or given in the Particular Specifications but are essential for the execution of work and services in workman like manner and sound construction. In case of difference of opinion between the Contractor and the Garrison Engineer as to whether or not certain item of work constitutes 'Minor Constructional Details' which is deemed to have been included in the Contractor's quoted lump sum, the decision of the Accepting Officer shall be final, conclusive and binding.

**1.19 & 1.20** 'Blank;

**1.21. REIMBURSEMENT/REFUND ON VARIATION IN TAXES DIRECTLY RELATED TO CONTRACT VALUE:**

(a) The rates quoted by the contractor shall be deemed to be inclusive of all taxes viz GST, duties, Royalties, Cess & other levies payable under the respective Statutes, if any applicable as on end date of Bid Submission of tender. No reimbursement /refund for variation in rates of taxes, duties, Royalties & other levies, and/or imposition/ abolition of any new/existing taxes, duties, Royalties & other levies shall be made except as provided in sub Para (b) here-in-after.

(b) (i) The taxes which are levied by Govt. at certain percentage rates of Contract Sum/Amount shall be termed as "taxes directly related to Contract value" such as GST, Labour Welfare Cess/tax and the like applicable as on end date of Bid Submission of tender but excluding Income Tax. The tendered rates shall be deemed to be inclusive of all "taxes directly related to Contract value" with existing percentage rates as prevailing on last due date for receipt of tenders. Any increase in percentage rates of "taxes directly related to Contract value" with reference to prevailing rates on last due date for receipt of tenders shall be reimbursed to the Contractor and any decrease in percentage rates of "taxes directly related to Contract value" with reference to prevailing rates on last due date for receipt of tenders shall be refunded by the Contractor to the Govt. /deducted by the Govt. from any payments due to the Contractor. Similarly imposition of any new "taxes directly related to Contract value" after the last due date for receipt of tenders shall be reimbursed to the contractor and abolition of any "taxes directly related to Contract value" prevailing on last due date for receipt of tenders shall be refunded by the Contractor to the Govt. /deducted by the Govt. from the payments due to the Contractor.

(ii) The contractor shall within a reasonable time of his becoming aware of variation in percentage rates and/or imposition of any further "taxes directly related to Contract value" give written notice thereof to the GE stating that the same is given pursuant to this Special Condition together with all information relating here to which he may be in a position to supply. The Contractors shall submit the other documentary proof/ information's as the GE may require.

(iii) The Contractor shall for the purpose of this condition keep such books of account and other documents as are necessary and shall allow inspections of the same by a duly, authorized representative of Govt. and shall further, at the request of the GE furnish, verified in such a manner as the GE may require, any documents so kept and such other information as the GE may require.

(iv) Reimbursement for increase in percentage rates/imposition of "taxes directly related to Contract value" shall be made only if the contractor necessarily & properly pays additional "taxes directly related to Contract value" to the Govt. with out getting the same adjusted against any tax liability or without getting the same refunded from the concerned Govt. Authority and submits documentary proof for the same as the GE may require.

**1.22 ADVANCES ON ACCOUNT OF NON-PERISHABLE MATERIALS**

The Contractor may be paid advance on account to the full value of the under mentioned materials only, brought on the site, on his furnishing guarantee bond(s) from a scheduled bank for the amount of the retention money, should otherwise be recoverable from him under the contract:

- (i) Factory made panelled shutters
- (ii) Factory made Aluminium windows/ ventilators
- (iii) Sanitary fittings
- (iv) Builders hardware fittings (iron mongery)
- (v) Electrical cables/ wires/ fittings/ fixtures
- (vi) Water supply pipes, fittings/ fixtures
- (vii) All other non-perishable materials as decided by the GE

The Bank Guarantee Bonds shall be executed for a period and on a form as directed by the Accepting Officer. The Contractor shall further arrange to extend the period of Guarantee Bond if and when necessary, as directed by the Accepting Officer or shall furnish fresh guarantee bond of similar value. It will be noted that advance on account to the full value to materials brought on the site is permissible only in respect of fittings and fixtures and other manufactured items which do not lose their identity. Materials like bricks, aggregate, precast concrete and similar items shall not be taken in the list.

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**SPECIAL CONDITIONS Contd...****1.23 CLEANING DOWN (Refer Condition 49 of IAFW-2249)**

The Contractor shall clean all floors, walls, remove cement, lime, paint marks/drops etc clean the joinery, glass panes etc, touch up all painters work and carry out all other necessary items of work in connection therewith and leave the whole premises clean and tidy before handing over the building. No extra payment shall be claimed by the Contractor for this operation.

**1.24 LABEL OF ARTICLES**

The Contractor shall provide aluminium LABEL of not less than 75mmx25mm and of adequate gauge with brass screws on articles like transformer, panel board, generating set etc indicating there on the names of the firm, the contract No. and year as directed by the GE. The cost of such aluminium labels shall be deemed to be included in the quoted rates against respective item of Schedule-'A'.

**1.25 DAMAGE TO STRUCTURE**

Any damage done to the structure built or being built by other agency during execution of work shall be made good by the Contractor at his own cost and the site of work left clean and tidy on completion. Rectification, reinstatement, making good etc shall conform to the standard of materials originally used in the work and finished work shall match with existing work in all respect to the entire satisfaction of the GE. In case of any dispute on this account the matter shall be referred to the CWE whose decision in writing shall be final, conclusive and binding.

**1.26 CONDITIONS OF WORKING:****1.26.1 CONDITIONS OF WORKING IN RESTRICTED AREA**

The entire work under this contract lies in "RESTRICTED AREA". The conditions of working in restricted area are stipulated as under:

- (a) **DEFINITION:** Restricted area(s) for the purpose of this contract means the area(s) declared as such by the units as shown in site plan/described in Special Condition.
- (b) **VERIFICATION OF ANTECEDENTS:** Verification of antecedents of Contractor's representatives / labours deployed at site in connection with execution of work under the contract, as per security requirement of User Unit/installation shall be the responsibility of the Contractor and all expenses in connection with verification of antecedent by Police Authority / Security Agency shall be borne by the Contractor.
- (c) **VISIT TO SITE WITHIN THE RESTRICTED AREA:** Permission to enter the restricted area(s) at time of submission of tenders can be obtained, through the Garrison Engineer. Tenderers are advised to send prior intimation to the Garrison Engineer about the particulars of the agents, representative etc., if any, the date and the time of their proposed visits so that necessary arrangement may be made by the GE, to secure admission. Whether tenderers visit the site or not they shall be deemed to have full knowledge of the restrictions on entering in, exit from and working within the restricted area.
- (d) **ENTRY AND EXIT:** The Contractor/ his agent(s)/ representative(s)/ workmen etc., and his materials carts, trucks or other means of transport, etc., will be allowed to enter through and leave from only such gate or gates and at such times as the GE or Authorities in charge of the restricted area may at their sole discretion permit to be used. The Contractor's authorised representative is required to be present at the places of entry and exit for the purpose of identifying his carts, trucks, etc, to the personnel-in-charge of the security of the restricted area.
- (e) **IDENTITY CARDS OR PASSES:**
  - (i) The Contractor, his agents and representatives are required individually to be in possession of an identity card or pass duly verified by the GE. The identity card or pass will be examined by the security staff at the time of entry into or exit from the restricted area, and also any time or number of times inside restricted area.
  - (ii) Identity of Workmen Every workman shall be in possession of an Identity Card. The identity cards shall be issued after a thorough investigation of the antecedents of the labourers, by the Contractor and attested by the officer-in-charge of the units concerned in accordance with the standing rules and regulations of the unit.
  - (iii) The Contractor shall be responsible for conduct of his workmen, agents or Representatives.
- (f) **SEARCH** Thorough search of all persons and transport shall be carried out at each gate and for as many times as gate is used for entry or exit and may also be carried out any time or any number of times at the work site within the restricted area.
- (g) **FEMALE SEARCHER** If the Contractor desires to employ female labour on works to be carried-out inside the area of factory, depot, park, unit, etc and a female searcher is not borne on the authorised strength of the factory, depot, park, unit, etc, at the time of submission of tender, he shall be deemed to have allowed in his tender for pay and allowances etc. for a Female Searcher (Class IV servant/ GP'D' servant) calculated for the period, female labours are employed by him inside the area. If more than one Contractor employs female labour during any month and female searcher(s) has/have to be employed in addition to the authorised strength of the factory, depot, park, unit, etc, the salary and allowances paid to the additional female searcher(s) shall be distributed on equitable basis between the Contractors employing female labour taking into consideration the values and periods of completion of their contracts. The GE's decision in regard to the amount recoverable on this account from any Contractor shall be final and binding.

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**SPECIAL CONDITIONS Contd...**

- (h) **WORKING HOURS** The units controlling restricted area, usually work during six days in a week and remain closed on the 7<sup>th</sup> day. The working hours available to the Contractor's labour/staff are however accordingly get reduced because of the time taken in security checks observed at the time of entry and exit and during working hours. The exact working hours, working days and non working days observed for these restricted area(s), where works are to be carried out shall be deemed have been ascertained by the Contractor before submitting his tender. The tenderers' attention is invited to the fact that total number of working hours for a unit, are prescribed in regulations and that they cannot be increased by the Garrison Engineer. The definition of "Working Day" as given under condition 1(t) of IAFW-2249 does not apply in case where the works are carried out in restricted area.
- (j) **WORK ON HOLIDAYS** The Contractor shall not carry out any work on gazetted holidays, weekly holidays and other non-working days except when he is expressly authorised in writing to do so by the Garrison Engineer. The GE may at his sole discretion declare any day as holiday or non-working day without assigning any reason for such declaration.
- (k) **ACCESS TO RESTRICTED AREA AFTER COMPLETION** After the works are completed and surplus stores etc. removed, the Contractor, his agents, representatives or workmen etc., will not be allowed any access to the restricted area except for attending to any rectification of defects pointed out to him by the GE.
- (l) **FIRE PRECAUTIONS**
- (i) The Contractor, his agents, representatives, workmen etc., shall strictly observe the orders pertaining to fire precautions prevailing within the restricted area.
- (ii) Motor transport vehicle, if allowed by the authorities to enter the restricted area must be fitted with serviceable fire extinguishers.

**1.27 METHOD STATEMENT**

- 1.27.1 The Contractor shall plan for execution and completion of work with foresight to ensure timely execution with the quality of work desired.
- 1.27.2 Period of completion shall be divided into months/ fortnights/ weeks and plan for each months/fortnights/weeks by preparing schedule for every months/ fortnights/weeks with following details, even before commencement of work.
- (a) Items of work to be executed with quantity
- (b) Labour to be deployed trade wise,
- (c) T & P to be deployed
- (d) Material to be brought to site for works to be executed next week
- (e) Type and number of engineers to be employed.
- 1.27.3 Any special item of work to be executed alongwith description of method as to how the Contractor intends to execute. It must be submitted in advance.
- 1.27.4 The Contractor shall also plan in advance and make available all the requisite safety equipment for the labour. A list of the same shall be given.
- 1.27.5 The Contractor shall produce test certificate of T&P being deployed at site. The test certificates shall indicate the present capacity of the T&P and shall not be more than 6months old.
- 1.27.6 The above details shall be furnished by Contractor within 10days of commencement of work. Work will be not allowed to be executed without these details. However, date of commencement of work will be within one month of acceptance as per contract.
- 1.28 **OFFICIAL SECRETS ACT**  
The Contractor shall be bound by the Official Secrets Act, 1923.
- 1.29 **CONCILIATION**
- 1.29.1 Scope of conciliation - The scope of conciliation shall be restricted to the following types of disputes with financial limits as indicated therein:
- (a) Disputes relating to levy of compensation for delay in completion-actual amount of Compensation
- (b) Disputes relating to technical examination of works.
- (c) Disputes relating to interpretation of the provisions of the contract with reference to their application to parties.
- (d) Disputes relating to non return of Schedule` stores over issued to the Contractor.
- (e) Any other dispute having fair chances of being resolved by conciliation and considered fit to be referred to conciliation by the parties.
- 1.29.2 For items (b), (c), (d) and (e) each as stated above the financial limit shall be ` 2,00,000/- (Rupees two lakh) or one percent of the Contract amount whichever is less.
- 1.29.3 **COMMENCEMENT OF CONCILIATION PROCEEDINGS**
- 1.29.3.1 The party initiating conciliation shall send to the other party a written invitation to Conciliate, briefly identifying the subject of the dispute.
- 1.29.3.2 Conciliation proceedings shall commence when the other party accepts in writing the invitation to conciliate.

Contd...

**SPECIAL CONDITIONS Contd...**

- 1.29.3.3** If the other party rejects the invitation, there will be no conciliation proceedings. If the party initiating conciliation does not receive a reply within 30 days from the date on which he sends or within such other periods of time as specified in the invitation, he may elect to treat this as a rejection of the invitation to conciliate and if he so elects, he shall inform in writing the other party accordingly.
- 1.29.4** **NUMBER OF CONCILIATORS** There shall be a sole Conciliator
- 1.29.5** **APPOINTMENT OF CONCILIATOR** All disputes brought out in para 1.29.1. (a) to (e) above shall be referred to the Sole Conciliator viz Serving Officer not below the rank of Superintending Engineer /Superintending Engineer (QS & C) having degree in Engineering or equivalent or having passed final / direct final examination of Sub Division II of Institution of Surveyors (India) to be appointed by the Engineer-in-Chief, Army Headquarters, New Delhi or in his absence the Officer officiating as Engineer-in-Chief or Director General of works specifically delegated by the Engineer-in-Chief in writing.
- 1.29.6** **STATUS OF EFFECT OF SETTLEMENT AGREEMENT** The settlement agreement signed by the parties as a result of conciliation proceedings shall have the same status and effect, as it is an arbitral award on agreed terms.
- 1.30** **PROCEDURE FOR REFERING DISPUTES (OTHER THAN THOSE FOR WHICH THE DECISION OF THE CE OR ANY PERSON IS BY THE CONTRACT EXPRESSED TO BE FINAL AND BINDING) TO SOLE CONCILIATOR FOR CONTRACTS VALUING LESS THAN RS.10.00 CRORE IN TERMS OF CONDITION 71 OF IAFW-2249**
- (a) The party initiating conciliation shall send to the other party a written communication to conciliate identifying the subject disputes.
- (b) on receipt of such request , the Accepting Officer shall with in fifteen days refer the matter to CE (CG) Goa or in his absence the officer Officiating as Chief Engineer
- (c) Chief Engineer within one month of receipt of request for appointment of sole conciliator shall appoint Sole conciliator who shall be serving officer having degree in Engineering or equivalent or having passed final/direct final examination of sub division II of Institution of Surveyors of India) recongnised by Govt and refer the disputes for settlement/agreement between the parties to the contract.
- (d) The sole Conciliator so appointed within fifteen days will enter into reference and fix a hearing to represent the matter by both the parties and finalize the finding within two months after entering into reference and shall forward his proposed settlement/agreement to both the parties to contract.
- (e) After receipt of settlement/agreement, the accepting officer and the other party with in one month shall communicate their consent or rejection of settlement/agreement to each other in writing and if the settlement/agreement as suggested by sole conciliator is agreed to by both the parties, shall have the same status and effect as it is on arbitral award on agreed terms within the provisions of Arbitration and conciliation Act 1996. The silence of both the parties after receipt of settlement/agreement as arrived by Sole Conciliator after one month shall be considered as finality of the settlement/agreement and shall be binding on both the parties not subject to challenge again. However, if any party rejects the settlement/agreement within one month from the date of receipt of settlement/agreement, the dispute may be referred by the aggrieved party for adjudication by arbitrator as per agreed terms of contract.
- (f) The amount of settlement shall be treated as an agreed amount payable under the contract and such payment shall be processed through hand receipt.
- 1.31** **LOSS OR DAMAGE ON ACCOUNT OF ENEMY ACTION :-**  
If as a result of enemy action, the Contractor suffers any loss or damage, the Government shall reimburse to the Contractor such loss or damage to the extent and in the manner hereinafter provided: -
- (i) The loss suffered by him on account of any damage or destruction of his plant/ equipment (as defined in special condition (a) above) or materials or any part or parts thereof. (The amount of loss assessed by the Accepting Officer of the Contract or the CWE in case of contracts accepted by GE, on this account shall be final and binding).
- (ii) The compensation paid by him under any law for the time being in force to any workman employed by him for any injury caused to him or to the workman's legal successors for loss of the workman's life.
- (iii) Payment of compensation for loss or damage to any work or part of work carried out (The amount of compensation shall be determined in accordance with condition 48 of General Conditions of Contracts IAFW-2249). No reimbursement shall be made nor shall any compensation be payable under the above provision unless the Contractor had taken Air Defence Precautions ordered in writing by the GE/OC concerned or in the absence of such orders, reasonable precautions. No reimbursement shall be payable nor shall any compensation be payable for any plant/equipment or materials not lying on site of work at the time of enemy action.

Contd...

**SPECIAL CONDITIONS Contd...****1.32 FORCE MAJEURE**

- 1.32.1 Should any force majeure circumstances arise, each of the contracting party shall be excused for the non-fulfillment or for the delayed fulfillment of any of its contractual obligations, if the affected party within 15 days of its occurrence informs the other party in writing.
- 1.32.2 Force majeure shall mean fires, floods, natural calamities or other acts such as war, turmoil, strikes (as not limited to be establishment of the seller), sabotage, explosions, quarantine, restrictions beyond the control of either party.
- 1.32.3 It is understood and agreed between the parties hereto that the rights and obligations of the parties shall be deemed to be in suspension during the continuance of the force majeure event(s) as aforesaid and the said rights and obligations shall automatically revive upon the cessation of intervening force majeure event(s). The period within which the rights and obligations of the parties shall be in suspension due to the force majeure event(s) shall not be considered as a delay with respect to the period of delivery and/or acceptance of delivery under the contract or otherwise the determinant of either party.
- 1.32.4 Notwithstanding the provisions of the immediately foregoing clause(s), it is further understood and agreed between the parties hereto that in the event(s) of any force majeure persisting for an uninterrupted period exceeding 06 (six) months, either party hereto reserves the right to terminate this contract upon giving prior written notice of 30 (thirty) days to the other party of the intention to terminate without any liability other than reimbursement on the terms provided in this agreement of the goods received.

**1.33 INDEMNITY BOND FOR PAYMENT OF LABOUR, WORKMEN EMPLOYED ON WORKS OR OTHER MONEYS OF TENDER PAYMENTS**

- 1.33.1 The contractor shall execute indemnity bond with the GE for enforcement of various enactments like wages Act 1936, Minimum wages Act 1948, employees liability Act 1938 workmen's compensation Act 1923 or any other Act or enactment's related to indirectly and directly labour employed on works and rules framed there under from time to time for the time being enforce. In case of non compliance of any of the enactment's by the contractor, the GE shall be empowered to exercise the powers vested in him as the principal employer and the amount so not paid to the labour/workman to be deducted from the sum become due under this contract or from other contracts in terms of condition 67 of IAFW-2249, General Condition of Contracts.

**1.34 LABOUR REGULATION AND ABOLITION ACT**

- 1.34.01 Contract labour (Regulation and Abolition) Act 1970 is applicable to MES contracts. Rates quoted by the contractor shall be deemed to take into account the cost etc, required to comply with the provisions contained in the said act and the rules framed under the said act..
- 1.34.2 In compliance of Govt of India Gazette Notification dated 15 Feb 2017 & MoD EPFO even letter No CA10/011 (33) 2015/HQ/Vol-II dated 02 Feb 2017, It is an express condition of the contract that :-**
- (a) **The contractor shall make the payment of minimum wages of employees or labours directly into AADHAR LINKED BANK ACCOUNT and proof of payment of wages through Aadhar linked bank account has to be submitted alongwith payments viz RARs & or Final Bill.**
- (b) **The contractor/suppliers shall also hold EPF, ESI account number & shall submit the details of PF payment made to EPFO on account of employees or labours alongwith RAR/Final Bill.**

Signature of Contractor

AGE(Contract)  
For Accepting Officer

**PARTICULAR SPECIFICATIONS**  
**ELECTRIFICATION**

**1. GENERAL**

**1.1** Works under this Contract shall be carried out as detailed in different parts of Schedule-'A' and in accordance with Particular

Specifications, Special Conditions, provisions given in General Summary and General rules and Specifications / Provisions given in MES SSR Part-I 2009 as well as General rules, Special conditions and preambles to various rates given in MES SSR Part- II 2020 (MES SSR Part-I and II hereinafter called as MES Schedule).

**1.2** The term 'General Specifications' referred to in these documents as well as referred to in IAFW- 2249 (General Conditions of Contracts) shall mean the specifications contained in the MES Schedule Part-I.

**1.3** General Rules, Specifications, Special conditions, method of measurements and all preambles in the MES Schedule shall be deemed to be applicable to the work under this contract, unless specifically stated otherwise in these documents. In case of variance between provisions in these documents and those given in MES Schedule, the provisions in these documents shall take precedence over the aforesaid provisions in the MES Schedule.

**1.4** The term 'as specified' wherever appears in tender documents and drawings, relates to relevant particular specifications and in its absence General specifications.

**1.5** Particular specifications in this section given hereinafter shall be generally applicable to all works covered under all parts of Schedule-'A'. The particular specifications are in brief and are only to particularise, amend and emphasize the specifications given in MES Schedule, which are not repeated.

**1.6** Where specifications for any item of work are not given in these particular specifications or in MES Schedule, specifications as given in relevant Indian Standard or Code of Practice shall be followed.

**1.7** Reference to any drawings which is mentioned in these particular specifications shall be deemed to be forming part of the tender. The tenderer shall refer such drawings/ details in the office of the Accepting Officer before quoting his tender.

**2. SCOPE OF WORK**

The scope of work consists of **DAY TO DAY MAINTENANCE AND REPAIR SUCH AS SWITCH BOARD, SWITCHES, MCB, MCB DBS, LED TUBE LIGHT FITTINGS, POST TOP LANTERN FITTINGS, STREET LIGHTS, TUBE LIGHTS, SECURITY LIGHTS, GATE LIGHTS, FRP JUNCTION BOXES, ELECTRIC GEYSERS, AIR CIRCULATORS, CEILING FANS, EXHAUST FANS ETC AT POWAI, WORLI, CG MALAD, MTNL, CGSD MANKHURD, MURUD JANJIRA AND PANVEL UNDER GE (I) (CG) DAMAN** as laid in Schedule-'A' and all as described and specified in Particular Specifications

**3. DIMENSION** In laying out the centre line dimensions mentioned in the drawings or deduced there from and or as directed by the Engineer-in-charge, shall be strictly followed.

**4. MATERIALS**

**4.1** All materials to be supplied by the Contractor for incorporation in work shall conform to relevant specifications / IS.

**4.2** In case specifications of materials needed for incorporation is not contained anywhere in the contract documents, the specifications of such materials proposed to be incorporated in work shall be approved in writing from the GE before incorporation in the work. The Contractor is advised to check availability, lead, time of procurement from these suppliers before quoting.

**4.3** As far as practicable all manufactured articles other than those manufactured in the Contractor's workshop at site shall bear ISI certification Mayk and which are readily available in the Mayket and are as given in Special Conditions. It is mandatory for the Contractor that ISI certified Mayked items/articles as listed therein shall only be incorporated in the work.

**4.4** Local materials such as stone aggregate, sand, lime, etc shall generally conform to the sample kept in the GE's office in addition to their conformity with relevant specifications given in the tender documents. The samples of such materials shall be got approved from GE in writing before the materials are brought at site in bulk. The Contractor shall submit samples of materials to the GE through Engineer-in-Charge for approval.

**4.5** Letters conveying approval of samples / materials by the GE will interalia mention source of supply / name of manufacturer, trade name/brand (if applicable) and reference to clause of the tender documents containing specification of particular materials.

**4.6** The Contractor and executives will ensure that the materials incorporated in the work are identical with the approved samples.

**5. TESTING OF MATERIALS**

**5.1** All the materials to be incorporated in the work shall be subject to quality control tests as per the testing procedure and frequency as laid down in relevant IS and or as specified in the tender and or as directed by the Engineer-in-charge.

**5.2** However any test required in the work shall also be got done in Govt. approved lab/Engineering College/National Test House as approved by the GE and entire cost of sample, handling, transportation and actual testing charges will be borne by the Contractor directly.

**PARTICULAR SPECIFICATIONS.....(Contd)**  
**ELECTRIFICATION**

**6. EXCAVATION AND EARTH WORK**

**6.1 EXCAVATION - GENERAL**

(a) Excavation shall be done to the depth as indicated or as directed by the Engineer-in-Charge.

(b) Decision of the Garrison Engineer shall be final, conclusive and binding as regards classification of soils and rocks met during excavation.

**6.2** Quoted cost of all items of shall also be deemed to include for bailing, pumping, dewatering from foundation trenches if water is met with or accumulated from any source or cause or working in water or liquid mud. No additional payment as stipulated in Clause 3.11 of MES Schedule Part-II will be admissible. In the event of deviations, no adjustment shall be made for cost of bailing, pumping and dewatering, specified hereinbefore. The Contractor shall be deemed to have acquainted himself with the sub-soil water table at site before submitting his tender.

**6.3** (a) Stone obtained from excavation in hard rock (if met with during excavation) (other than by chiseling) shall become property of the Contractor. The Contractor shall pay ` 352.50/cum of measured quantity of stone obtained in excavation and shall remove it off the site with prior permission of the GE/ the Engineer-in-Charge. No lead shall be payable for the removal of stone from site. The Contractor may use the stone obtained from excavation in filling under floors or road work if permitted by the GE. In cases the excavation in hard rock is carried out by chiseling then the excavated material shall be used in filling as specified hereinafter in floors or road work. The recovery of ` 411.25/cum of stack measurement (without any deduction for voids) of hard rock shall be effected from the Contractor to the extent of material used in filling. Surplus excavated material shall be disposed off outside MD land as directed.

(b) Blasting of rock is prohibited. Excavation in hard rock (if met with during excavation) shall be by chiseling or any other agreed method.

**6.4.** In case timbering to excavation is required and specifically ordered by the GE in writing, it shall be paid as deviation.

**6.5 TRENCHES FOR FOUNDATION AND PIPES**

(a) The excavation shall be restricted to dimensions as directed and or as specified in MES Schedule. Excavation made, if any, in excess of required depth/width shall be made good by the Contractor with cement concrete 1:7:12 type F2 without extra cost to the Government

(b) The beds of the trenches shall be watered and well rammed and any depressions thus formed shall be filled with approved earth as required to the level and slopes as directed by Engineer-in-Charge.

**6.6 FILLING IN TRENCHES/UNDER FLOORS**

(a) The approved soil/soft rock obtained from excavation (except earth/ spoil obtained from surface excavation ) shall be used for returning, filling in trenches, under floors or any other situation after removing big stones, grass, roots and vegetables and other organic matter. Earth mixed with small stones/pebbles (if approved by the GE) is permitted for use in filling around pipes after the pipes are laid and tested. Any additional earth required for the purpose of filling shall be arranged by the Contractor at no extra cost to the Department from outside the Defence Land.

(b) Filling under floors / sides of trenches shall be in layers not exceeding 250mm and each layer shall be watered, compacted and rammed as approved by the Engineer-in-Charge.

**7.0 INTERNAL ELECTRIFICATION**

**7.1 SCOPE OF WORK**

**7.1.1** The extent of work under this contract is as indicated in relevant part of Schedule 'A' Particular specifications and drawings. All references to clauses in succeeding paragraphs pertain to MES Schedule unless otherwise specified. The layout of conductors/cable, route shall be as directed by the Engineer-in-Charge.

**7.1.1** The contract covers complete internal electrification upto and including main switches, MCBs and distribution board all as specified and shown on drawings.

**7.2 GENERAL REQUIREMENTS:-**

**7.2.1** The requirement pertaining to materials, conformity with Indian Electricity Act and Rules, workmanship, testing, record of installations, safety procedures and practices and fire safety shall be all as specified in clause 19.2 of MES Schedule Part-I.

**7.2.2** The contractor is deemed to have included rates/amount quoted against respective items of Schedule 'A' for cost of making holes/chases where required through masonry or concrete work for taking in cables/conduits and conductors etc and making good the same to match with existing work, all as specified in Schedule 'A', drawings and particular specifications.

**7.2.3** All work of internal electrification shall be executed by fully qualified licensed electricians all as per latest practice and latest IS codes/IE rules. Certificate of qualification shall be produced on demand by Engineer-in-Charge.

**PARTICULAR SPECIFICATIONS.....(Contd)****ELECTRIFICATION**

- 7.2.4 The position of electrical fittings and fixtures shown on drawings are tentative. The exact position of these shall be as directed by Engineer-in-Charge at the time of execution without any price adjustment.
- 7.2.5 Run's of wire and locations of fitting and switches shall be Mayked on walls and soffits of roof/floor slabs for the wiring for the approval of Engineer-in-charge. The contractor may have to realign the wiring and or relocate the fittings, required for final approval at no extra cost to Government. The entire work shall be carried out as approved in sample qtrs.
- 7.2.6 Looping-in-system of wiring shall invariably be used throughout the installation. Where it is absolutely not practicable, then necessary junction boxes of approved make be used as permitted by Engineer-in-charge. Soldered or taped joints are not permitted for jointing under any circumstances. Porcelain connectors connected with metal parts of brass shall be used.
- 7.2.7 All equipments, fittings and accessories, material etc, for the wiring installation shall be ISI Mayked and of approved make or as specified in Sch 'A'. However equipment, fittings & accessories, material etc which are not being manufactured with ISI Marks, GE shall approve reputed make conforming to relevant IS without any price adjustment.
- 7.2.8 Contractor shall produce sample of all the fittings accessories, materials etc for approval by the GE, before incorporation of work.
- 7.2.9 Notwithstanding, the fact that equipment has passed the inspection carried out during the stage of a manufacture, the contractor is not relieved from his obligations to conform to the quality, workmanship, guarantee of performance etc.
- 7.2.10 Any defective material, equipment or workmanship which may come to the notice of the Garrison Engineer or his representative after installation shall be liable for rejection and the contractor shall have to replace such materials, equipment etc or rectify the defects at his own cost.
- 7.2.11 All wiring shall run either vertical or horizontal or parallel to the wall. Diagonal running shall not be permitted except where conduits are concealed in RCC floor or roof slabs.
- 7.3 Switch boxes and boards shall be internally clean. There should not be any dead mortar, cut pieces of wires, screws and washers etc inside them.
- 7.3.1 Light and power points shall run through the separate conduits.
- 7.3.2 The limit of max load on each lighting circuit shall be 800 watt and max eight points or as directed by the Engineer-in-charge.
- 7.3.3 The limit of the power circuit outlet points shall be just two per circuit.
- 7.3.4 Twin core twisted flexible cord shall be of size 23/0.0076 in or 0.5 sq mm in cross sectional area shall be provided where not indicated in respective items of Sch 'A'.
- 7.3.5 No joint shall be allowed in the wire.
- 7.3.6 A short length of wire shall be left as spare at each switch board/box.
- 7.3.7 Conduits (in case of concealed conduit wiring) of correct size shall be laid before plastering, this shall be properly jointed together to ensure electrical continuity.
- 7.3.8 The contractor shall submit a detailed wiring diagram which shall indicate main switches details, run of various mains and sub mains, positive of all points, circuits and relative points to which they are connected and numbering of the individual circuits, at no extra cost to the Government.
- 7.3.9 The quoted rates of points wiring shall include for all the necessary provisions contained in clause 1 on page No.402 of MES Schedule Part-II (2020) as applicable to concealed wiring through PVC conduits.
- 7.4 **SYSTEM OF WIRING**
- 7.4.1 Wiring shall be done with type of cable as mentioned in Sch 'A' item. Wiring shall be done in accordance with Para 19.132 of MES Schedule (Part I). Wiring is to be terminated in sunk cast iron or pressed steel terminal boxes for mounting fittings like switch sockets and regulators all as specified in Schedule 'A'.

**PARTICULAR SPECIFICATIONS.....(Contd)****ELECTRIFICATION**

- 7.4.2 Prior to laying and fixing of conduits/ casing capping etc. the contractor shall carefully examine the drawings indicating the layout, satisfy himself about the sufficiency of number and sizes of conduits, location of junction boxes, sizes and location of switch boxes and other relevant details.
- 7.4.3 Joints between conduits and accessories shall be securely made, to ensure earth continuity.
- 7.4.4 Embedded conduits shall be of correct size with junction boxes. In the roof in case of concealed conduit wiring junction boxes with wooden plugs to seal spare openings shall not be used.
- 7.4.5 **CABLES**
- 7.4.6 Cable for internal wiring for light, power and sub- mains shall be single core PVC insulated and sheathed or unsheathed (as specified in Schedule 'A') with multi-stranded copper conductor FRLS cables 1100 Volts grade conforming to IS: 694 with ISI Marked.
- 7.4.7 The insulation shall consist of compounded polyvinyl chloride. The thickness of insulation shall not be less than nominal value mentioned in appropriate table of IS 694. The composition of the compound of sheath shall polyvinyl chloride. The value of thickness of PVC sheathing shall be in accordance with those specified in appropriate tables. The insulation on and sheath shall be homogeneous body. The cable shall be of approved make/grade and ISI Marked.
- 7.4.8 All materials for fittings/accessories of cable etc to be incorporated in the work shall strictly comply with
- 7.5 **PVC RIGID NON-METALLIC CONDUIT FITTINGS**
- 7.5.1 Conduit shall comply with IS: 9537(Part-III) -1983. The fittings for rigid non-metallic PVC conduit shall conform to IS: 3419-1988. Conduit & conduit fittings shall be ISI Marked. These shall be procured from any of the manufacturing firms mentioned in Appendix 'A' here-in-after.
- 7.5.2 The maximum permissible number of 1100 volts grade single core copper cables that may be drawn into the rigid non-metallic conduit shall be all as per MES SSR Part- I clause 19.125, Table (B).
- 7.6 **RIGID STEEL CONDUIT FITTINGS**
- 7.6.1 Conduit shall comply with IS: 9537(Part-II) -1981 and accessories/fittings shall be as per IS-3837 and 2667 respectively. These shall be of make as mentioned in Appendix 'B' here-in-after.
- 7.6.2 The fittings for rigid steel conduit shall conform to relevant IS and shall be all as specified in Schedule 'A' and as approved by the Engineer- in-Charge at site.
- 7.6.3 **CASING 'N' CAPPING** : PVC casing 'N' capping and accessories/fittings shall comply with IS: 14927(Part-II)-2001 and shall be of double interlocking type. These shall be of make as mentioned in Appendix 'B' here-in-after.
- 7.6.4 **SUNK TYPE BOXES** : Boxes for housing electrical accessories recessed into wall shall be of sheet steel or cast iron as indicated/directed and shall conform to IS :14772-2000 and as specified in clause 19. 38 of MES Schedule. The boxes shall be covered with sheet top cover as described in Schedule 'A' items and shall have beveled edges.
- 7.7 **MINIATURE CIRCUIT BREAKERS(MCBs)**
- 7.7.1 MCBs shall be conforming to IS : 8828 of 1996 and shall be ISI Marked. These shall be housed in DBs & shall be suitable for 'C' curve characteristics.

**PARTICULAR SPECIFICATIONS.....(Contd)****ELECTRIFICATION**

- 7.7.2 MCB shall have quick made and break non-welding silver alloy contacts both on the manual and automatic operation. MCBs shall be of thermal magnetic type with inverse time delay over current tripping having a short circuit rupturing capacity as indicated in respective items of Schedule 'A' and if no rupturing capacity indicated in items of Schedule 'A' then it shall be of 10kA. In case of Multiple type MCBs, the tripping must be on all the poles and operating handle shall be common. Pressure clamp terminals for stranded solid conductor insertion are acceptable upto 4 sq mm for copper and for higher ratings the terminals shall be suitably extended for bolted lugs connections. All terminals shall be suitably screwed. MCBs shall be housed in distribution board fabricated out of sheet steel and shall have IP-40 degree of protection to prevent entries of dust. Ample clearance between the conductors and sheet steel body shall maintained in order to obviate any chance of short circuit. Movable conduit entry plates shall be provided at top and bottom to facilitate drilling holes to suit individual requirement. The MCBs shall be mounted on a high grade rigid insulating support and connected by electrolytic copper bus bars phase separation barriers made out of arc resistant materials between the phase. Bus bars shall be colour coded for Phase identification and shall be PVC shrouded. Reference shall also be made to clause 19.46 of the MES Schedule Part-I for further requirements of distribution boards
- 7.7.3 Suitable earth terminal shall be provided on the distribution board for bonding to earth.
- 7.7.4 **MCBs ISOLATORS:** It shall conform to IS:13947(Part-3), 1993 and shall be as per clause 19. 46.3 of MES Schedule Part-I. These shall be of make as mentioned in Appendix 'B' here-in-after.
- 7.8 **MCB DISTRIBUTION BOARDS/ SHEET METAL ENCLOSURES (DBs) FOR HOUSING MCBs, MCCBs/ RCCB' ELCB AND ISOLATOR ETC.**
- 7.8.1 Sheet steel enclosures for mounting isolators, MCBs and MCCBs shall be fabricated out of steel sheet as per manufacturer's Design and Specifications and finished with stove enamel paint. Lable channel shall be provided for labeling outgoing circuit. Two knock out, of suitable dia shall be provided at top for incoming cables but at bottom corresponding to number of ways. Bus bars shall be rated accordingly. Distribution boards (DB's) shall be recessed in walls to become flush with wall where it is possible or otherwise as directed by Engineer in Charge. Proper Mayking shall be provided in the DB to indicate type of circuit in power and light. Neoprene gasket shall be used in DBs. All wiring connection required to be made with MCCBs, MCBs and Isolators shall be carried out by providing necessary thimbles/lugs duly crimped. Reference shall also be made to clause 19.46.1 of the MES Schedule Part-I for further requirements of distribution boards.
- 7.9 **SWITCHES/SWITCH SOCKET OUTLETS 5 PIN 5 AMPS SP/6 PIN 15 AMP SP 250 VOLTS :-**
- 7.9.1 The base shall be made of vitrified ceramic materials or tough non-ignitable moulded insulating material. These shall be of flush type 6 to 16 amps multi-purpose type.
- 7.9.2 Current carrying parts shall be made of brass, copper phosphorous, bronze,aluminum alloy or any other suitable material. Springs shall be of corrosion resistant metal. Attachment fitting screw and other non current carrying parts shall be of mild steel, aluminum alloy or insulating material. All switches, sockets and switch socket outlets shall bear ISI certification Mayk.
- 7.10 **CHANGEOVER SWITCH**
- 7.10.1 Changeover switch shall be provided as per description of relevant schedule item and shall be all as specified in clause 19.48 of MES Schedule Part-I.
- 7.11 **CEILING ROSES, LAMP HOLDERS ETC.**
- 7.11.1 Ceiling rose shall be as specified in clause 19. 32 of MES Schedule and shall bear ISI certification Mayk.
- 7.11.2 Lamp holders shall be provided as per description of relevant Schedule 'A' item and as specified in clause 19. 41 of MES Schedule.
- 7.12 **FLUORESCENT TUBE LAMPS,FITTINGS & ACCESSORIES**
- 7.12.1 Starters & capacitors for use with tubular fluorescent lamps shall comp-ly with IS: 2215-1983 & IS:1569 - 1976.Other accessories/fittings for fluorescent tube lamps shall comply with relevant Indian Standard as specified in clause 19.35 of MES Schedule Part-I.

**PARTICULAR SPECIFICATIONS.....(Contd)****ELECTRIFICATION****7.13 LIGHT FITTINGS**

7.13.1 Light fittings such as wall fittings, ceiling fittings, bulk head fittings and the like shall be of high grade of make & model as indicated in description of item under Schedule 'A', or in absence of the same ,as mentioned in Appendix 'B' here-in-after. In case no make for fittings have been indicated then the same shall be of reputed make bearing ISI Mark as approved by GE.

7.13.2 Fluorescent tube lamps, fittings and accessories shall comply with the Indian Standard specifications as brought out in clause 19.35 of the MES Schedule Part-I.

**7.14 LED LIGHT FITTINGS**

7.14.1 LED light fittings/post top luminaries shall be provided as specified in Sch A and as specified by Engineer-in-Charge. Make shall be as given in Appendix A.

7.14.2 **WARRANTY FOR LED Fittings:-** Contractor shall submit original manufacturers replacement warranty certificate stating defective light fittings shall be replaced without any extra cost for minimum two years after date of completion of the work. The contractor shall write CA No and Date of installation on each LED fittings.

**7.15 MOUNTING HEIGHT**

7.15.1 Mounting height of various light fittings and accessories are given hereunder as guidance only, however actual position of fittings and accessories shall be all as directed by GE/Engineer-in -Charge during execution of works as per actual site requirement :-

- |     |                            |    |  |
|-----|----------------------------|----|--|
| (a) | Fluorescent light fittings | :- | 215 cm from FFL  |
| (b) | Ceiling light fittings     | :- | These shall be fixed centrally in the soffit of slab or as directed. |
| (c) | Switch/Fan Regulator       | :- | 100 cm from FFL  |
| (d) | Socket outlet              | :- | 100 cm from FFL  |
| (e) | Ceiling fan                | :- | Bottom of fan to be 260 cm from FFL or as directed.                  |

7.15.2 Position of fittings not indicated above shall be as directed by the Engineer-in-Charge.

7.16 **PORCELAIN CONNECTORS:** Porcelain connectors shall be provided inside the box for fan hook. The wiring shall be done in such a way that ceiling rose is proposed for fan and tube light fitting the porcelain connector need to be provided.

7.17 **POWER CONTACTORS:** The power contactors shall be of AC 3 Phase and having 2 NO + 2 NC Aux, Contact blocks.

7.18 **MCCBs** : Moulded Case Circuit Breaker shall conform to IS:13947(Part 3)-1993 and IEC-60947(Part 2). It shall be suitable for operational voltage of 415V, AC, 50 Hz, 3 Phase, 4 wire system for the rated current and ultimate breaking capacity as indicated in description of item in Schedule 'A'. The operating handle shall be provided with door interlock facility, so that the door cannot be opened when MCCB is in 'ON' position. Reference shall also be made to detailed requirement as specified in clause 19.100.14 of MES Schedule Part-I

**7.19 EARTHING**

7.19.1 Refer clause 19. 137 to 19. 145 of MES SSR (Part I) and electrical plate No. 3 of MES SSR (Part I).

7.19.2 The contractor shall execute installation of earth plate in the presence of Engineer-in-charge. Charcoal dust and salt and return filling shall be done in layers not exceeding 20cm depth, properly watered and rammed. Surplus spoil shall be carted away to a distance not exceeding 50 metre and the site left clean and tidy.

7.19.3 No earth pit shall be made within 2 metre of a wall or foundation. Efforts shall be made to locate them in grass or near flower beds or water taps. The distance between two earthing pits shall be at least 2 metres.

**PARTICULAR SPECIFICATIONS.....(Contd)**  
**ELECTRIFICATION**

**7.20 TESTING**

7.20.1 The installation after completion of work shall be tested for following :-

**(a) Insulation Resistance**

(i) The insulation resistance shall be measured by applying between earth and the whole system of conductor or any section thereof with all fuses in place and all switches closed, and except in earthed concentric wiring, all lamps in position or both poles of installation other wise electrically connected together, a DC voltage of not less than twice the working voltage, provided that it does not exceed 500 volts for medium voltage circuits. Where the supply is derived from three-wire (AC or DC) or a poly-phase system the neutral pole of which is connected to earth either direct or through added resistance the working voltage shall be deemed to be that which is maintained between the outer or phase conductor and the neutral.

(ii) The insulation resistance in mega ohms of an installation measured as in (i) shall be not less than 50 divided by the number of points on the circuit, provided that the whole installation need not be required to have an insulation resistance greater than one mega ohm.

(iii) Control rheostats, heating and power appliances and electric signs, may, if desired, be disconnected from the circuit during the test, but in that event the insulation resistance between the case or frame work, and all live parts of each rheostat, appliance and sign shall be not less than that specified in the relevant Indian Standard specification or where there is no such specification shall be not less than half a mega ohm.

(iv) The insulation resistance shall also be measured between all conductors connected to one pole or phase conductor of the supply and all the conductors connected to the middle wire or to the neutral on to the other pole of phase conductors of the supply. Such a test shall be made after removing all metallic connections between the two poles of the installation and in these circumstances the insulation resistance between conductors of the installation, it shall be not less than that specified in (ii) above.

(v) On completion of an electric installation (or an extension to an installation) a certificate shall be furnished by the contractor, countersigned by the certified supervisor under whose direct supervision the installation was carried out. This certificate shall be in a prescribed form as required by the Engineer-in-Charge.

**(b) Testing of Earth Continuity Path** :-The earth continuity conductor including metal conduits and metallic envelopes of cable in all cases shall be tested for electrical continuity and the electrical resistance of the same along with the earthing lead but excluding any added resistance or earth leakage circuit-breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm.

**(c) Testing of Polarity on Non-linked, Single-Pole Switches**

(i) In a two wire low voltage installation, a test shall be made to verify that all non-linked, single-pole switches have been fitted in the same conductor throughout and that such conductor has been connected to an outer or phase conductor or to the non-earthed conductor of the supply.

(ii) In a three-wire or four-wire installation, a test shall be made to verify that every non-linked, single-pole switch is fitted in a conductor connected to one of the outer or phase conductor of the supply.

7.20.1.1 The test shall be carried out in the presence of the Engineer-in-Charge and shall Be signed by Engineer-in-Charge and the contractor. Three copies of test sheet shall be submitted by contractor. In case the earth result does not fall within the specified limit, as mentioned in IS/IE Rules, the contractor shall dig earth pit beyond 2.5 metres deep to obtain the desired earth results.

7.20.1.2 All testing instruments labour, materials and incidentals necessary to conduct the test shall be arranged by the contractor at his own cost.

**7.20.1.3 Wiring diagram/drawings**: Wiring diagram, inventory of the buildings and test records/reports in five copies shall be submitted by the contractor after completion of work.

**7.21 EARTHING WITH COPPER STRIP**: Earthing complete with copper plate electrode 600 mm x 600 mm x 3.15 mm burried directly in ground vertically in pit of depth not less than 2.25 metre below normal ground level with top edge of the earth plate at a depth not less than 1.5 metre below normal ground level surrounded from all sides with mixture of charcoal and common salt in alternate layers and electrode connected to copper strip 20 x 3 mm size by means of brass bolts, nuts, check nuts and washers, earth strip protected by galvanized steel pipe 32 mm bore (light grade) connected to main switch board or any other electrical equipment all as shown in electrical plate No. 3 of SSR-2009 Part I and including necessary excavation and earth work in any type of soil, 20 mm bore medium grade GI pipe for watering, funnel with wire mesh, PCC (1:3:6), type C-1 chamber, pit cover of precast RCC (1:2:4), type B-1, reinforced XPM of weight not less than 4 kg/ Sq.m and MS frame etc.,complete all as specified.

**PARTICULAR SPECIFICATIONS.....(Contd)**  
**ELECTRIFICATION**

- 7.22 EARTHING WITH GI WIRE/ GI STRIP: Earthing complete with galvanized steel earth plate electrode 600 mm x 600 mm x 6 mm buried directly in ground vertically in pit of depth not less than 2.25 metre below normal ground level with top edge of the earth plate at a depth not less than 1.5 metre below normal ground level surrounded from all sides with mixture of charcoal and common salt in alternate layers and electrode connected to galvanized iron wire/ GI strip by means of GI bolts, nuts, check nuts and washers, earth wire/strip protected by galvanized light grade steel tube 15/40 mm bore and connected to main switch board including necessary excavation and earth work, GI medium grade 20 mm bore medium grade GI pipe for watering, funnel with wire mesh, PCC (1:3:6), type C-1 chamber, pit cover of precast RCC (1:2:4), type B-1, reinforced XPM of weight not less than 4 kg/ Sq.m and MS frame etc., complete all as specified.
- 7.23 ELECTRICAL TESTS: All tests for earthing as specified in clause 19.146 of MES Schedule Part-I shall be carried out. Joint test sheet shall be prepared in quadruplicate after completion of job by contractor without any extra cost. Test certificate shall be sign by Engineer-in-Charge and rep of contractor/ contractor held on record
- 8 REPAIR/ REWIRING TO FANS
- 8.1 GENERAL:
- 8.1.1 The items of Sch 'A' of the contract are deemed to cover all tests required for testing and smooth running of fan and other equipments.
- 8.1.2 All works shall be executed by proper skilled licensed persons.
- 8.2 MATERIALS AND SAMPLES :
- 8.2.1 All materials incorporated in the work except where manufactures name are given shall generally be of indigenous make conforming to relevant IS.
- 8.2.2 Before starting the work the contractor shall produce samples of all materials and shall obtain approval in writing from the Accepting Office before placing bulk order for materials.
- 8.2.3 WINDING WIRE: The winding wire shall be of copper conductor the wire shall conformed to relevant IS. The size/ gauge of wire and the No. of turns shall be the same as per defective fan. The winding wire shall be of following makes :-  
 (a) Devi Dayal, (b) HTP, (c) Chetak.
- 8.3 PRECAUTIONS:
- 8.3.1 During dismantling and reassembling, every precautions shall be taken by the contractor to prevent damage to any part of the fans. Any damage caused due to carelessness and negligence's of contractor shall be made good by the contractor at his own expenses.
- 8.3.2 The materials obtained from taking out or demolition/ dismantling shall be the property of the contractor for which credit has been considered under Schedule of credit.
- 8.3.3 Any other material retrieved for which credit has not been given shall be the property of Govt. & Contractor shall deposit the same in the MES STORE YARD OF AGE E/M for which proper receipt shall be obtained by the contractor from the Engineer-in-Charge in token of delivery of such old materials without any extra cost to department.
- 8.4 TESTS: After repairs, the fans shall be tested in the presence of Engineer-in-Charge and contractor. Test report shall be signed by both the Engineer-in-Charge and contractor without any extra cost to the department.
- 8.5 TRANSPORT: No Government vehicle will be provided for making put/in of equipment for repair/after repairs contractor is to make his own arrangement for the above purpose

**PARTICULAR SPECIFICATIONS.....(Contd)**  
**ELECTRIFICATION**

**9. CONCRETE WORK****9.1 CEMENT**

(a) Cement required for the work under the contract shall be procured, supplied and incorporated in the works by the Contractor under his own arrangement. Cement shall be of tested quality and shall comply with the requirements of SSR, IS Specifications as amended.

(b) Type of cement for the subject work shall be ordinary Portland cement grade 53 (Fifty three).

**9.2 FINE AGGREGATE**

(a) Fine aggregate for concrete works shall be natural sand/crushed, stone sand/crushed gravel. Sand or combination thereof shall be conforming to IS-383 and grading within the limits of Grading Zones II to III all as specified in clause 4.4 of MES Schedule.

(b) The sand shall be hard, dense, strong, durable, clear and free from veins and adherent coatings and free from injurious amount of disintegrated pieces, alkali, vegetable matters and other deleterious substances. As far as possible, flaky and elongated pieces should be avoided.

(c) Natural river sand/crushed stone sand shall be obtained from the permanent river sources as approved by the GE.

**8.3 COARSE AGGREGATE**

(a) Coarse aggregate for all cement concrete work shall be graded broken/ crushed trap stone obtained from approved quarries as specified in clause 4.4 of MES Schedule. Mixture of the two types shall however not be used.

(b) Coarse aggregate shall be obtained from the sources as approved by the GE.

**8.4 WATER**

Water shall conform to the requirement stipulated in IS-456 and as per Clause 4.9 of MES Schedule.

**8.5 MIX OF CONCRETE**

Mix of concrete shall be all as stipulated in various items of Schedule-'A'.

**09 TO 21 : -BALANK-****22.3 LAYING OF CABLES**

22.3.1 HT/LT underground cables shall be laid in trenches with sand cushioning and PCC cover slabs protection all as specified in MES Schedule (Part-I).

22.3.2 For road/Nallah/Floor crossings and to cross-hard standing the cable shall be laid in GI Pipe, etc. Rates quoted for cables shall include for cost of straight through cable box with compound if required to be provided. Cable route indicators shall be provided at regular intervals of 30 metres or as directed by Engineer-in-Charge. In addition one indicator shall be provided at every turning of route and at every cable joint.

22.3.3 The LT cables shall be of 1100 volts grade XLPE insulated PVC sheathed, armoured heavy duty conforming to IS-7098 - I (amended upto date).

**23. SAND CUSHIONING / FILLING**

23.1 Sand for filling in trenches shall be free from foreign matters and shall be natural river sand from the sources approved by the GE.

23.2 Sand shall be stacked at site before incorporation and the entire quantity of sand shall be recorded in measurement books Mayked suitably as 'Not to be abstracted' before incorporation and shall be signed by the Engineer-in-charge and the Contractor. Consolidated thickness of sand as specified shall be recorded for payment purpose.

23.3 Sand cushion shall be done as specified in Clause 19.75 of SSR Part I.

**24. PRECAST CONCRETE CABLE COVERS**

24.1 Pre-cast concrete cable covers shall comply with IS-5820-1970 specifications for pre-cast concrete cable covers and shall be of class and type as indicated in Sch-'A'.

24.2 PCC cable covers shall be staked at site before use in work. PCC cable covers shall be passed by Engineer-in-charge for incorporation in the work and shall be got approved by the Garrison Engineer. The entire qty of covers shall be recorded in the MBs 'Not to be abstracted' before incorporation and shall be signed by the Engineer-in-charge and the Contractor.

**PARTICULAR SPECIFICATIONS.....(Contd)**  
**ELECTRIFICATION**

- 24.3 These shall be factory fabricated and made as per procedure given in IS.
- 24.4 Covers shall be got tested for transverse strength to the expense of the Contractor from a recognized Govt lab or as specified in Appendix-'D'.
- 24.5 PCC Cable cover shall be provided as specified in Schedule-'A' and as per SSR Part-I 2009 clause 19.20.
- 25. CUTTING OF PCC ROADS / PATH, ETC**
- (a) Cutting of roads, etc. shall be done with good precision so as not to disturb much road area, etc and as directed by the Engineer-in-charge.
- (b) The Contractor may use mechanical cutters at his discretion without any cost to the Government.
- (c) Roads / paths, etc wherever cut or dug out shall be suitably barricaded / cordoned so as to check any accident to passing traffic / pedestrians. The area shall be suitably Marked as of ongoing cable repair works, etc.
- (d) Roads / paths, etc wherever cut or dug out shall be suitably made good with the original specifications therein to the entire satisfaction of the Engineer-in-charge.
- 26. GI TUBING**
- (a) All water tubing shall be galvanised light grade and fittings shall comply with the requirement of relevant IS. Laying of GI pipes shall be in accordance with Clause 18.51 of MES Schedule. The Contractor shall use proper bends, elbows, tees etc at turning corners. The Contractor shall provide screwed plugs to all open ends of pipe on completion of days work. The requirement pertaining to materials, conformity with National Building Code, workmanship, testing, record of installation shall be all as specified in MES Schedule (clause 18.40 and 18.41) shall be followed. All pipe work shall be laid or fixed to be completely airtight and watertight as specified.
- (b) The pipes passing through the walls, floor, slabs, roof slab etc. shall pass through sleeves of approved materials of adequate sizes. Holes through walls, etc. around the sleeves to full thickness of wall shall be finished to match surrounding surface.
- 27. STEEL TUBULAR POLES**
- 27.1** Poles to be used in the work shall be of sizes as mentioned in Schedule-'A'. The pole shall conform to IS-2713 (Part II) (Revised). Necessary test certificate is to be furnished by the tenderer.
- 27.2** The poles should be swaged type and shall be made of tubes of suitable length, swaged together when hot and may be either electrically welded type or seamless. The poles shall be well finished, clear and clean from harmful defects, ends of poles shall be cut square. These shall be straight smooth and cylindrical of the designations as mentioned in Schedule-'A'. The bottom of the poles shall be run welded continuously with 300x300x6mm thick MS base plated and top of the poles shall be welded with CI pole cap all as directed by the Engineer-in-charge. Poles / struts shall be painted with two coats of approved aluminium paint over a coat of red oxide primer on exposed portion (one coat before and the other after erection). Portion requiring to be embedded in PCC/excavation shall be painted with two coats of approved bituminous paint over one coat of approved red oxide paint.
- 27.3** All the poles while erecting shall be kept truly vertical position in the pit till the PCC foundation is laid and set properly. All strut, poles shall after lowering in the pit be fixed to the main pole with MS clamps bolts, nuts and washers and concrete shall be laid after fixing the poles in position. The entire work of erection of poles shall be carried out in accordance with IS-5613 (Part-II) Code of practice for design, installation and maintenance of overhead power line Part-I upto and including 22kV Section-II installed and maintenance.
- 27.4** Tensile strength of the poles shall not be less than 42kg/sqcm.
- 28. MCCBs MCBs** shall conform to IS 13947(Par 3,1993) and IEC-60947 (Part 2)
- 28.1** MCCBs shall all as specified in Clauses 19.100.14 to 19.100.14.7 of MES Schedule Part I(2009)
- 28.2** The terminal shall be suitable for both copper and aluminium terminations.
- 29. DISTRIBUTION BOARDS / LT PANEL BOARDS / FEEDERS**
- 29.1** Distribution boards / LT panel boards shall be fabricated out of CRCA of gauge / thickness as indicated in items duly treated to make it rust proof and finished in even baked powder coated paint
- 29.2** The panel shall be dust proof and vermin proof in construction and factory made.
- 29.3** The cubical panel shall be free standing compartmentalized and sectionalized one, each switch gear shall have MS sheet on its sides (fully enclosed with cover on top and front operated having hinged cover for ACBs switches/cables alley instructions compartments and removal covers for bus bar portions. Suitable for both top and bottom cable entry with gland plate and in conformity with GA. Schematic line diagram and other drawing attached. Panels with depth more than 500mm shall be approachable from rear as well for working purposes.
- 29.4** The panel shall have earth terminals one on each end. GI earth strips of size of 50x6mm shall be provided at the back for the full length of the panel, cost of which shall be included in the panel.

**PARTICULAR SPECIFICATIONS.....(Contd)**  
**ELECTRIFICATION**

- 29.5** The panel in general shall be fabricated as per the general arrangements and as approved. However, the Contractor shall submit his own GA of each panel and fabricate the same only after the approval of the same by the GE. Panels shall be manufactured keeping in view of their locations in different areas and their placements in that area. The minimum external dimension of LT panels shall be as indicated in respective item of Sch 'A'.
- 29.6** The phase bars of bus shall be of copper and as per relevant IS conforming to relevant IS standards.
- 29.7** For connections and interconnections, solid links shall be provided for switches of rating 63Amps and above and wires with stud below 3Amps.
- 29.8** Rating of the interconnecting solid links shall be of the capacity of the outgoing switch/feeder or MCB/MCCB/ACB/Switch Gear/Contactor etc.
- 29.9** 2.5kV test for 60second shall be carried out as per prescribed norms.
- 29.10** Insulations test for 2.5kV for one minutes (IS-3623)
- 29.11** Temperature rise test (IS-9678 &8623)
- 29.12** The bus bar shall be of copper and will be completely enclosed by heat shrinkable PVC sleeves. Care should be taken to ensure that air is not rapped inside it.
- 29.13** Joints in the bus bar shall be with doubled fishplates having minimum two bolts and nuts on either side of the butt joint.
- 29.14** Minimum spacing as stated below shall be maintained:
- |                     |   |      |
|---------------------|---|------|
| a) Phase to phase   | - | 26mm |
| b) Phase to neutral | - | 26mm |
| c) Phase to earth   | - | 26mm |
| d) Neutral to earth | - | 19mm |
- 29.15** The panel shall be air ventilated, dust damp and vermin proof having continuous welding at joints.
- 29.16** Only neoprene gaskets shall be used at all joints adjacent section for doors/covers etc.
- 29.17** Inside area of the panel shall also be treated with anti rust chemical and painted.
- 29.18** Panel instruments shall be wired with a minimum 2.5sqmm multi stranded copper conductor cable (wires).
- 29.19** Thimbles of make specified hereinafter shall only be used. Copper lugs for copper wires and aluminium lugs for aluminium wires shall be used.
- 29.20** All current transformers shall be polyester cast resin only, as tape wound CTs shall not be accepted.
- 29.21** Base channel shall be provided all around.
- 29.22** The bus bar shall be supported on SMC supports.
- 29.23** All the hardware shall be zinc coated.
- 29.24** The compartmentalization between various / different feeders shall be achieved by using sheet steel partitions. There shall be complete partitioning between bus bars cable alleys and capacitors bank enclosures.
- 29.25** All voltmeter and ammeter analogue one shall be flush mounted type and square in shape conforming to IS-1248 for accuracy
- 29.26** LED cluster type ON/OFF indicators lamps shall be provided suitable for operation 230 volts A/C supply lamps shall be provided with On/OFF toggle switch as a control.
- 29.27** Small panel instrument wiring shall be done neatly and bunched effectively for easy identification. Complete wiring diagram shall be submitted for approval before manufacturing the panel.
- 29.28** The outgoing feeders as well as incoming feeders shall have clear identity Mayk in white paint on their respective covers. Similarly, indication for these feeders shall be given in bus bars and cables alley cambers for termination of cables.
- 29.29** A guarantee of one year (defects liability period) form the date of commissioning of LT panels shall be furnished by contractors against all sort of manufacturing defects and malfunctions of the system.
- 29.30** Wherever remote start/stop push buttons and indication are asked for these shall be provided in a MS sheet box complete with mounting arrangement in an approved manner and suitable to the specific location.
- 29.31** Inscription plates of anodized aluminium acrylic for individual feeder shall be provided
- 29.32** Power and control terminals shall be segregated power terminals shall be stud type and controls terminals shall be clip on type
- 29.33** Danger notice plates shall be written in distinguishable font size and in three languages (Hindi, Mayathi and English) indicating the supply voltage with conventional 'skull & bone' sign therein

**PARTICULAR SPECIFICATIONS.....(Contd)**  
**ELECTRIFICATION**

**29.34 TESTS**

The Contractor shall carry out the following tests at site in the presence of Engineer-in-Charge and results will be recorded in triplicate, signed by both parties.

- (a) Tests on cables for IR, earth resistance, continuity and cross-phasing,
- (b) Earth test for the earthing and the entire installation as per IS-732 and
- (c) The Contractor shall arrange the testing equipment and the labour required for test without any cost to the Government. If the tests are not satisfactory, the Contractor shall rectify the defect and retest the installation to the entire satisfaction of the Engineer-in-charge.

**30. FLEXIBLE CHORDS TWISTED WITH COPPER CONDUCTOR**

Flexible cord twin core with tinned annealed copper conductor stranded, PVC insulated, twisted together, size 23/0076.

**31. GUARD WIRES AND EARTH WIRE**

Guard wire shall be of GI all as specified in clause 19.11.1 and 19.11.2 of SSR Part-I 2009.

**32. WINDING WIRES**

Winding wires/conductors for winding of compressor motors and other situations shall be of super enameled copper wire having high electrical conductivity and shall conform to the requirement of relevant IS. Sizes/gauge of the winding wire pitch and the number of winding shall be checked proper to achieve a satisfactory performance.

**33. PORCELAIN CONNECTORS**

Porcelain connectors shall be provided inside the box for fan hook. The wiring shall be done in such a way that wires from connector to the fan are not visible. In situations where ceiling rose is proposed for fan and tube light fitting the porcelain connector need to be provided.

**34. BOLTS, NUTS WASHERS**

All bolts, nuts and washers used for connecting the earth lead with electrodes shall be galvanised iron in case of galvanised iron pipe/plate earth electrode and of tinned brass in case of copper plate electrodes

**35. MANUFACTURER'S INSTRUCTIONS**

Where manufacturers have furnished specific instructions relating to the materials used in the job covering points not specifically mentioned in these tender documents, such instructions shall be followed in all cases subject to approval of the Garrison Engineer.

**36. TECHNICAL DATA**

The tenderer shall submit a comprehensive schedule of technical data and complete manufacturer's specifications for all items of equipment and material incorporated including the manufacturer's name and address.

**38. FIRE PRECAUTIONS**

**38.1** No combustible materials / lining, etc shall be used anywhere in the entire job. Insulating materials required to be incorporated in the works for insulation purposes shall be non-combustible. The Contractor shall produce the test certificates in support of this requirement from the manufacturer of the insulation materials.

**38.2** All working plants / equipments and accessories such as compressors, pumps, fans, etc shall be installed in accordance with the latest Engineering practice.

**38.3** All electrical equipment and wiring shall be electrically earthed in accordance with the latest Indian Electricity Rules.

**39. SYNTHETIC ENAMEL PAINTING WORKS**

(a) All synthetic enamel paint, emulsion paint shall be of 1<sup>st</sup> quality manufactured by the standard firms of make as per Appendix-'A' attached.

(b) The Contractor shall inform the GE, within three weeks of the acceptance of the tender, the brand/names of the manufacturers of paint proposed to be used in the works and submit samples thereof and obtain prior written approval of the GE before their use in works.

(c) The Contractor shall when so required by the GE, produce certificate from the manufacturer or their representative to establish that the brands of paints purchased by the Contractor from them, satisfy the requirements of the relevant Indian Standards.

(d) Paints for priming coat, under coat and finishing coat shall be of the same manufacturer.

(e) Tint of paint, if shall be as stipulated and as approved by the GE.

(f) Steel and iron work shall be painted in the manner as specified in clause 17.8 of MES Schedule Part-I.

**40. WRITING WORKS / MAYKING OF EQUIPMENTS AFTER REPAIRS**

(a) Letters shall be written as directed by the Engineer-in-charge.

(b) Letters, etc shall be painted with thick paint, so that they stand out boldly and solidly without showing signs of brush Mayks, if necessary these shall be repainted until the desired result is obtained.

(c) Surfaces shall be cleaned off droppings of paint, etc. all as directed by the Engineer-in-charge.

**PARTICULAR SPECIFICATIONS.....(Contd)**  
**ELECTRIFICATION**

**41. CLEANING OF SITE**

The Contractor shall properly clean the work site as work progresses and shall remove all rubbish and debris from the site time to time when necessary and when directed. On completion the Contractor shall ensure that the premises and/or site are cleaned off surplus material, debris, sheds, etc. shall remove all fixtures & fittings so that the whole installation is fit for immediate occupation or use and to the satisfaction of the Garrison Engineer.

**42. CO-OPERATION/CO-ORDINATION WITH OTHER AGENCIES**

The work shall be executed as approved by the Garrison Engineer. No claim whatsoever shall be entertained from the Contractor on the plea that the work has been executed in the above circumstances or under difficult conditions. It shall be the sole responsibility of the Contractor to enforce necessary working at the site of work in spirit of co-operation and amity with all other agencies. Flow of material & labour whether of his own or from other agency as per laid down time schedule shall be the responsibility of the Contractor for timely completion of the work.

**43. M.S. CHEQUERED PLATES :-**

43.1 M S chequered plates shall be as per requirement given in IS-3502, 1994 and shall be all as specified in clause 10.5 of SSR Part-I (2009) and as described in relevant item of BOQ.

43.6 **CABLE TERMINATION AND JOINT KITS**. This shall comply with the requirements as specified in clause 19.22 to 19.22.2 of MES Schedule Part I, 2009.

44.7 For road/Nallah/Floor crossings and to cross hard-standing the cable shall be laid through GI Pipe. Rates quoted for cables shall include for cost of straight through cable box with compound if required to be provided.

45. **MINIATURE CIRCUIT BREAKER/MCB DB** : These shall conform to IS 8828-1996 and shall be housed in suitable size standard sheet metal enclosure. Make shall be as per Appx 'A'.

46. **MOULDED CASE CIRCUIT BREAKER(MCCB)** : The MCCB shall conform to IS-2556 (Part-I to Part V). Make shall be as per Appx 'A'.

47. **APFC Panel** – These shall be all as described in relevant items of Sch 'A' (BOQ).

**48. TAKING OVER OF THE EQUIPMENTS FOR REPAIRS**

Existing machinery / equipment / plants / light fittings ordered to be repaired shall be carefully removed / taken down from the position by the Contractor and removed to Contractor's workshop / site office. Necessary gate passes, issue vouchers for the same issued by the Engineer-in-Charge shall be kept on records. A register recording following particulars of the machinery / equipments / plants /fittings shall be maintained duly signed by the Engineer-in-Charge and the Contractor. The machinery / equipment / plant /light fittings after repairs shall be brought back and installed at the original position. The register as mentioned above shall contain the following details:

- (a) Serial No.
- (b) Reference of issue voucher under which the item of works has been ordered
- (c) BOQ /Schedule-'A' item No.
- (d) Date of issue of the item to the Contractor for repair
- (e) SM No. / MES No. of the item/plant/equipment
- (f) PRB No / Page No.
- (g) Location from where the equipment is removed
- (h) Date on which the item returned back and installed in position
- (j) Remarks
- (k) Signature of Engineer-in-Charge/Contractor.

48.1 Repairing to light fittings and equipment shall be carried out to make them operational complete all as specified in BOQ/SCH A and with standard Engineering practice and all as directed by Engineer-in-Charge.

**49. CFL/MV/HPSV/METAL HALIDE/LED LAMP FITTINGS AND ACCESSORIES**

49.1 These shall be provided as indicated in description of relevant item in Schedule 'A' and all as specified in clause 19.35.1,19.36,19.36.1 & 19.36.2 of the MES Schedule Part-I. These shall be procured from any of the manufacturing firms specified in Schedule 'A',or in absence of the same, as mentioned in Appendix 'A' here-in-after.

49.2 Ballasts shall be of type & wattage suitable for metal halide/sodium vapour light fittings and shall be of an approved make. Igniters for HPSV/MH luminaires shall be provided as per description of BOQ/Schedule 'A' items.

**PARTICULAR SPECIFICATIONS.....(Contd)**  
**ELECTRIFICATION**

50. **DISMANTLING AND MAKING GOOD**

- 50.1** All dismantling work (except for which separate item is given in Schedule-'A' /BOQ) required for execution of work mentioned in Sch-'A' shall be deemed to be included in the rate quoted. The Contractor shall make good all disturbed surface to match with the existing specification and to the entire satisfaction of the Engineer-in-Charge. All dismantled material except shown in Schedule of credit shall be property of department and shall be handed over in store yard for which no removal shall be payable.
- 50.2** The Contractor should take necessary precaution for dismantling to the required shape/size. Contractor without any payment shall make all excess dismantling and damages caused to existing structure good.
- 50.3** Rates quoted for dismantling/taking down/fixing in repair shall include cost of making good, sorting of materials, and their removal as directed by the Engineer-in-Charge.

Signature of Contractor

AGE (Contracts)  
for Accepting Officer

PARTICULAR SPECIFICATIONS (Contd....)**LIST OF APPROVED MAKES TO BE INCORPORATED IN WORK**

<b>ELECTRICAL ITEMS</b>		
1	Power Transformer 33/11 KV	ANDREW YULE, BHEL, SCHNEIDER, BHARAT BIJLEE, INDO TECH TRANSFORMER
2	Transformer 11 KV/ 415 Volts	BHEL, KIRLOSKAR, CROMPTON GREAVES, SCHNEIDER, ABB, ANDREW YULE, BHARAT BIJLEE, VOLTAMP, PACTIL, GE ENERGY, INDOTECH TRANSFORMER
3	Isolation Transformers	PUREVOLT, CONSUL, ADROIT
	GOD (Gang Operated Device), 11 KV and above	PACTIL (MATRO), ELPRO, ECE, OBLUM, ATLAS
4	HT Switch gear 33 KV, VCB (Out Door)	BHEL, ABB, SIEMENS, SCHNEIDER, BIECCO LAWRIE LIMITED
5	HT Switch gear 11 KV, VCB (Indoor/Outdoor)	BHEL, ABB, SIEMENS, SCHNEIDER, BIECCO LAWRIE LIMITED, PASCAL Switch Care.
6	HT Switch gear protection relay electronics	ASHIDA, EASUN REYROLL, ABB, SCHNEIDER, C&S, MEGAWIN, L&T
7	HT Trivector Meter	SECURE, L&T, ABB (ELSTER), SCHLUMBERGER
8	HT Ring main unit, SF6, 11 KV	ABB, SIEMENS, CROMPTON GREAVES, SCHNEIDER
9	Package/unified Sub-Station	ABB, SIEMENS, CROMPTON GREAVES, SCHNEIDER
10	HT Cable joints heat shrinkable/cold shrinkable/push on type	RAYCHEM, M-SEAL, DENSON, BIRLA 3M, MAHINDERA & MAHINDERA
11	CT & PT, 11 KV/33 KV	PRAGATI, AE, KAPPA, SCHNEIDER, L&T (AS PER HT PANEL MANUFACTURERS DESIGN)
12	HT 33 KV/11 KV XLPE Cables	UNIVERSAL CABLES (UNISTAR), KEI, ASIAN CABLES (RPG), CCI (TROPODOUR)
13	Disc Insulator/Pin Insulator 11 KV and 33 KV ratings	BHEL, WS INSULATORS, JAYSHREE, SOUTHERN INSULATOR, MODERN INSULATOR, YAMUNA POWER (DENSON)
14	HT/LT Steel tubular swaged pole	NATIONAL TUBING CO. KANPUR, SOHAN LAL & SONS, QUALITY STEELS, BHARAT CONDUIT & POLES CO MUMBAI, INDIA ELECTRIC POLES MFG CO LTD (RAIGARH), INDIA TUBE CO LTD (JAMNAGAR), JAIBHARAT POLES MFG & ENGRS CO (BARODA)
15	HT/LT PCC Poles	SATHE CEMENT VASTU NIRMITI PUNE, DEVANG FENCE THANE, VAIBHAV CEMENT PRODUCT PUNE, AKAT COMPANY MUMBAI
16	Bus Bar Trunking	L&T/SIEMENS/SCHNEIDER/ABB/GE/LEGRAND
17	Lightning Arrestor non-linear resistor type	OBLUM/ELPRO/ATLAS/PACTIL/CROMPTON GREAVES/SCHNEIDER/BHEL
18	LT Panels	SIEMENS/L&T/ABB/SUDHIR, ADLEC, UNILEC, NEPTUNE, JAKSON MILESTONE, TRICOLITE, ADHUNIK SWITCH GEAR, HPL India Ltd : CPRI approved / ISO 9001 certified.
19	LT AIR CIRCUIT BREAKER	L&T/ABB/GE/SIEMENS/BCH/LEGRAND/SCHNEIDER/HPL

**PARTICULAR SPECIFICATIONS.....(Contd)**

	MCCB	PREMIUM : LEGRAND (DPX), SIEMENS (SENTREN), SCHNEIDER (MERLIN GERIN), COMPAT NSC, L&T (DH/DL), BCH (XS/AH/TB-2), ABB (ISOMAX SERIES), GE (RECORD PLUS)
20	ACB (Drawout type)	GE, SCHNEIDER, HAVELLS, HPL
21	Contactors	SIEMENS, ABB, L&T, GE, SCHNEIDER
	MCB/RCBO/RCCB/DB/Isolators	L&T (HEGAR), LEGRAND (LEXIC), SIEMENS (BETAGUARD), SCHNEIDER (MG-MULTI-9), ABB, GE, HAVELLS
22	Prewired DB	HAVELLS/LEGRAND/L&T/SIEMENS/ABB
23	Voltmeter/Ammeter/Frequency meter/Meters/ PF Meter (Analog Type)	AE, IMP, L&T (RISHAB), HAVELLS, BENTEC, TTL TECHNOLOGIES
24	Voltmeter/Ammeter/Frequency meter/PF Meter (Digital Type)	ENERCON, DIRIS, DUCATI, L&T (RISHAB), TRINITY, RAAS, CONCORD, CONTROL & SWITCH GEAR, AE, SECURE, TTL TECHNOLOGY.
25	Selector Switch	SIEMENS, SULZER, KAYCEE
26	Street light timers	L&T, LEGRAND, GE, BAJAJ, SIEMENS, ABB, BCH.
27	LT Cables, 1100 Volts, XLPE	ASIAN CABLES (RPG), UNIVERSAL CABLES (UNISTAR), KEI, ELECTRON, CCI (TROPODOUR), FINOLEX, FORT GLOSTER
28	Change over Switches	L&T, SIEMENS, GE, HAVELLS
29	Tamper proof electronic meter	SECURE, L&T, ANCHOR, ACCURATE METERS, HAVELLS, HPL
30	(a) Voltage Stabilizers 5 KVA to 25 KVA	SINETRAC, BRENTFORD, VINITEC, AE, MICROTECH
	(b) Voltage Stabilizers upto 4 KVA	VINTEC, SINETRAC, MICROTECH, POWER WARE, V GUARD
	(c) Voltage Stabilizers above 25 KVA (Servo Controlled)	ANDREW YULE (BRENTFORD), AE, APLAB
31	UPS (off line & on line)	TATA LIMBART, SINETRAC, APLAB, POWER CONVERSION TECH, PROTECH SERVICES
	(a) above 5 KVA	MICROTECH, LUMINOUS, LABOTEK
	(b) upto 5 KVA	
	(I) Engine	CUMMINS, KIRLOSKAR OILS ENGINES, ASHOK LEYLAND, GREAVES LTD, COTTON, MAHINDRA
	(II) Alternator	KIRLOSKAR ELCTRIC, CROMPTON GREAVES, STAMFORD, ABB, SIEMENS
	(III) Acoustic Enclosures for DG Sets (as per CPCB norms)	BHASKAR POWER PROJECTS PVT LTD, KALA GENSET, GOEL POWER ENGINEERS, JACKSON, SUDHIR GENSET LTD, POWERICA, RA POWER, SHREE DIESELS
32	LT Capacitor Banks	DUCATI, SIEMENS, L&T, ABB, EPCOS, GE, UNIVERSAL (UNISTAR)
33	APFC Panels	L&T, SCHNEIDER, HPL
34	Electronic Energy Meters	SECURE, L&T, ALSTOM (AREVA), HPL
35	CTs (LT)	KAPPA, IMP, AE, SIEMENS, L&T
36	PVC insulated Copper wires - 650/1100 Volts	FINOLEX, L&T, ELEKTRON, NICCO, HAVELLS
37	Steel Conduit	AKG, BEC, NIC, BHARAT STEEL TUBES, CTI
38	PVC casing capping	PRESS FIT, CLASSIC, PRECISION, SUPREME
39	PVC Rigid Pipe (Heavy Duty)/ PVC Conduit Pipe	FINOLEX, PRINCE, TIRUPATI, DUTRON, SUPREME, AKG, PRECISION
40	Piano type Switch/ Sockets	ANCHOR, LEGRAND, HAVELLS
41	Modular Switches/ sockets	ANCHOR (ROMA), LEGRAND, CRABTREE

**PARTICULAR SPECIFICATIONS.....(Contd)****Appendix "A" (Contd...)**

42	Ceiling Rose	ANCHOR, LEGRAND, CRABTREE
43	Street light luminaires HPSV/Metal Halide	PHILIPS, BAJAJ, WIPRO, HAVELLS
44	LED Street Light, LED Highbay	Philips, Havells ,WIPRO,BAJAJ
	Fittings	
45	Fluorescent tube light fittings , LED tube light fittings	PHILIPS, BAJAJ, WIPRO, HAVELLS
46	CFL Fittings	PHILIPS, BAJAJ, WIPRO, HAVELLS
47	CFL Lamps	OSRAM, PHILIPS, CROMPTON GREAVES, BAJAJ, WIPRO, HPL INDIA LTD, HALONIX, ADHUNIK SWITCH GEAR, SURYA ROSHNI LTD
48	Exhaust Fans	KHAITAN, BAJAJ, USHA, HAVELLS
49	Electric Call Bell	ANCHOR, LEGRAND
50	Wall Mounted Fan/Air Circulator	KHAITAN, BAJAJ, USHA, HAVELLS ALMONARD/USHA/KHAITAN/BAJAJ
51	PVC Pole Boxes	SINTEX, FINOLEX, UNIVERSAL
52	Flame Proof Electrical Fittings	BALIGA LIGHTNING EQUIPMENT, BAJAJ, SUDHIR ELECTRICALS, SHYAM SWITCHGEAR, FLEXPRO
53	ACSR Conductor	ALL-IND, ICC, NICCO, BHARAT CONDUCTORS, INDIAN ALUMINIUM CO
54	Laminated Sheet Cover	HYLAM, FORMICA, GREEN LAMINATED BOARDS, ANCHOR, BAKELITE
55	Aviation Obstruction Light	BAJAJ, HAVELLS, WIPRO, PHILIPS
56	Thimbles/Studs/Lugs	DOWELLS, JAIPURIA BROTHERS
57	Lifts	OTIS, KONE, SCHINDLER, JHONSON
58	LT Changeover Switch	L&T, SCHNEIDER, HAVELLS
59	Battery Charger	VOLTSTART, AE, BCH
	<b>WATER SUPPLY</b>	
60	GI Pipes	JINDAL, TATA, BST, SWASTIK
61	HDPE Pipe	DUTRON, FINOLEX, TIRUPATI, SUPREME, DUPLON (RELIANCE), KISAN MOULDING LTD
62	CI Pipes	ELECTRO-STEEL, KESORAM, IISCO
63	DI Pipes	ELECTRO-STEEL, JINDAL SAW, TATA METALIKS KUBOTA PIPES LTD, LANCO INDUSTRIES, ELECTROTHERM (INDIA LTD)
64	CPVC Pipe	FLOW GUARD, DUTRON, FINOLEX, ASTRAL
65	PPR Pipe	SFMC, RELIANCE, SUPREME
66	MS/ERW Pipes	TATA, JINDAL, BST
67	Sluice Valves	KIRLOSKAR, L&T (AUDCO), LEADER, UPADHAYAY, KALPANA
68	Non Return Valve	KIRLOSKAR, LEADER, VENUS, NVR
69	Pump Sets-Mono Block	KIRLOSKAR, BEST & CROMPTON (BEACON), MATHER & PLATT
70	Centrifugal Pumps	KIRLOSKAR, BEST & CROMPTON (BEACON), KSB, MATHER & PLATT
71	Submersible Pumps	KSB, CALAMA, KIRLOSKAR,GREAT INDIA
72	Submersible Cable	FINOLEX, NICCO, HAVELLS, ELEKTRON
73	Motor Starter	L&T, BCH, SCHNEIDER, SIEMENS, GE
74	Motor	BHARAT BIJLEE, KIRLOSKAR ELECTRIC, CROMPTON GREAVES, ABB
75	Single Phase Preventor/Phase Sequence corrector	L&T, SIEMENS, MINILEC
76	Silver Ionization Plant	Siemens, BHEL, Bharti Waters, Jyoti Waters, Pious Waters

**PARTICULAR SPECIFICATIONS.....(Contd)****Appendix "A" (Contd...)**

77	Dual Ionization Plant	Siemens, BHEL, Bharti Waters, Jyoti Waters, Pious Waters
78	Air Release Valve	BIR, KIRLOSKAR, LEADER AUDCO, L&T
79	Foot valve	VENUS, KIRLOSKAR, LEADER, VENUS, L&T (AUDCO)
80	Butterfly Valves	ADVANCE, L&T (AUDCO), NORMAX, CASTLERS
81	Battery	EXIDE, AMCO, AMARARAJA
82	CI Fitting	UPADHAYAY, KEJERIWAL, BIR, SANT, VENUS
83	Water Meter	CAPSTON, DASHMESH, ACCUFLOW.
84	Gate Valves/ Globe Valves	ZOLOTO/LEADER/ROTEX/CRI
	<b><u>AIR CONDITIONING</u></b>	
85	Air Handling Unit	BLUE STAR/VOLTAS/CARRIER/ZECO
86	Cooling Tower	MIHIR/PAHARPUR/VOLTAS/POLO/DELTA
87	Chillers/Condenser	VOLTAS/BLUE STAR/CARRIER
88	Compressors	COPELAND/DANFOSS/SANYO
89	Pumps (Chillers & Condensers)	KIRLOSKAR/GRUNDFOSS/MATHER & PLATT/BEST & CROMPTON (BEACON)
90	Motors	SIEMENS/ABB/CROMPTON GREAVES/KIRLOSKAR ELECTRIC/BHARAT BIJLEE/NGEF
91	Pot/Y-Strainer	EMERALD/RAPID COOL/DANFOSS/SPARLAN
92	MS Piping	TATA/BST/JINDAL
93	(a) Butterfly Valve	ADVANCE/AUDCO/SANT
	(b) Check Valve/Non Return Valve	ADVANCE/AUDCO/SANT/BIR
	(c) Gate Valve	LEADER/AUDCO/ITT BELL & GOSSETT
94	Balancing Valve	ADVANCE/ AUDCO / DANFOSS / FLOWCOM
95	Pressure Gauge	FIEBIG/ H. GURU/ BAKER MERCER/ DANFOSS
96	Dial Type Thermometers	FIEBIG/ H. GURU/ TEDDINGTON
97	Insulation	
	(i) Glass wool	OWENS CORNING/UP TWIGA/LLOYD
	(ii) Insulation (Expand Polystyrene)	CAPRICORN/BEARDELL/PENGUIN/LLOYD
	(iii) Insulation (Cross Polyethylene Foam)	SUPREME/TROCELLANE/PARAMOUNT/LLOYD
98	(a) Controls (3 Way Valves Actuator & Motor)	SIEMENS/HONEYWELL/JOHNSON/ANERGY
	(b) Thermostats	ANERGY/SIEMENS/HONEYWELL/JOHNSON/ANERGY
99	Extruded Aluminium Grills Diffusers	DYNA CRAFT/RAVISTAR/MAPRO/CARYAIRE/COSMOS
100	(a) Control Cable	NICCO/ASIAN CABLES/UNIVERSAL/FINOLEX/CCI (TROPODOUR)/ELEKTRON
	(b) Power Cable	GLOSTER, ASIAN, UNIVERSAL, ELEKTRON
101	Contactors/Starters	L&T/SIEMENS/ABB/BCH
102	Overload Relay	L&T/SIEMENS/ABB/BCH
103	Time Delay Device	L&T/SIEMENS/SCHNEIDER/BCH
104	Single Phasing Preventer	L&T, SIEMEN, MINILEC, SCHNEIDER
105	GSS Sheets	SAIL / TATA / JINDAL
106	Fire Dampers/ Grill/Diffuser	DYNA / RAVISTAR / MAPRO / CARYAIRE / ATE
107	Expansion Valve	DANFOSS/SPORLAN/RANCO
108	Switchgears MCCBs/ ACBs/MCBs	LEGRAND/L&T/SCHNEIDER (MERLIN GERIN)/ GE / SIEMENS / BCH / C&S
109	LT Control Panel	FACTORY FABRICATED CONTROL PANEL WITH CPRI TEST CERTIFICATE
110	LT current transformer	IMP, KAPPA, AE, SIEMENS
111	HP/LP/Op Cut Out	PENN/INDOFOSS/RANCO/DANFOSS/JOHNSON
112	Digital temp and RH meters	HONEYWELL/FORBES MARSHALL/SUBZERO/JOHNSON CONTROL

**PARTICULAR SPECIFICATIONS.....(Contd)****Appendix "A" (Contd...)**

113	Centrifugal Fans (for AHU's)	NICOTRA/KRUGER/COMBIFREE/OEM'S MAKE
114	Strip Heaters	RACOLD/DASSPASS/UE
115	Humidstat	PENN, DANFOSS, HONEY WELL, JOHNSON, INDOFOSS
116	Filter	JOHN FOWLER/THERMODYNE/TENACITY/PUROLOTER
117	Factory Built Duct	ROLASTAR/TECHNO AIR/CAM DUCT
118	Selector Switch	L&T, ELMA, OMEGA, KAYCEE
119	Indicating light	SIEMEN, CONCORD, C&S
120	Digital Voltmeter/ Ampmeter	AE/EMERCON/SECURE/L&T/DUCATI/C&S/DIRIS
121	Current Transformer	AE, KAPPA, SCHEINDER
122	Flexible Connector	CORI ENGINEER, RESISTO FLEX
123	Hot Water Generator	RAPID COOL/ROSS THERMAL SYSTEM PVT
		LTD/REYNOLD/RAPID CONTROL
124	Air Washer	BREEZE AIR/THERMODYNE/CHEMPAC/KLENZOID
125	Non chemical type electrostatic	SCALEOFF (MFD BY M/S WELDON), SCALEX (MFD BY M/S
	scale preventor	TBI SYSTEM), HYDROCON
126	Split AC , Window AC	DAIKIN/BLUESTAR/LG/VOLTAS/SAMSUNG

**NOTES:**

1. Items shall be considered whichever is applicable only.
2. Sources indicated are only for guidance and approval of the Garrison Engineer shall be taken in proper time before procurement of materials and its incorporation.
3. The above list is not exhaustive but indicative of all items required for work under the contract.
4. Sources of materials shall be as above or in the vicinity thereof. The tenderer shall ascertain the actual position/exact location of source before submitting his tender and no additional payment shall be made on account of misunderstanding of its distance from site of works. Contractor may bring material conforming to contract specifications from other sources without any price adjustment after obtaining written approval of the Garrison Engineer.
5. The tender shall amongst other things also ascertain all information such as royalties, taxes duties and other charges etc. on the materials and no additional payment shall be made on account of the foregoing.
6. Makes specified above shall be provided only when no makes are mentioned in the 'Schedule of Works' and Particular Specifications.

Signature of Contractor

AGE (Contracts)  
For Accepting Officer

**APPENDIX - 'A-I' TO PARTICULAR SPECIFICATIONS**

## LIST OF BIS CERTIFIED PRODUCTS TO BE INCORPORATED IN THE WORK :-

Ser No	MATERIALS	IS NUMBERS
1	2	3
1.	Concrete Integral water proofing compounds	IS-2645-2003
2.	Electrical Works:	
	(a) Ceiling rose	IS-371-1979
	(b) Tumbler switches	IS-3854-1966
	(c) Socket outlet – 3 Pin plug and socket	IS-1293-2005
	(d) Switch fuses (mains & switches)	IS-4064-
	(e) Rigid steel conduit	IS-9537 Part-II-1981
	(f) Rigid non-metallic conduits	IS-3419-1988
	(g) Single core cable polythylene insulated and PVC sheathed cable	IS-1596-1977
	(h) Starter for tube light	IS-2215-1983
	(j) Fluorescent lamps	IS-2418 Part-I to IV-1977
	(k) Aluminium stranded conductor	IS-398-1976
	(l) MCBs	IS-1828-1996
3..	Code of practice for fire safety of buildings (general) fire fighting equipment and its maintenance.	IS-1648 - 1961
4.	Code of practice for installation of internal fire hydrants in multi-storied Buildings.	IS-3844 - 1966
5.	Dimensions for pipes, threads where pressure tight joints are required on the threads.	IS- 554
6 .	Sheet rubber jointing and rubber insertion jointing.	IS- 638
7.	Copper alloy gate, globe and check valves for water work purposes.	IS-778
8.	Sluice valves for water work purposes ( 50mm to 300mm ).	IS-780
9.	Couplings double male and double female, instantaneous pattern for fire fittings	IS-901
10.	Mild steel tubes, tubular and other wrought (Part-I & II) steel fittings	IS-1239
11.	Swinging type wall mounted hose reel with drum	IS-884
12.	Fire hose tubing	IS-388
13.	Foot valves for water work purposes	IS-4038
14.	Landing valves.	IS-5290
15.	Anti-corrosion treatments for under ground MS pipes.	IS-10221
16.	Swing check type reflux (non- return) valves.	IS-5312
17.	Fire fighting delivery hose.	IS-636-1988
18.	Specification for fire hose, delivery coupling, branch pipe, nozzles	IS- 903-1984
19.	Pumps.	IS-12469

Note: Corresponding year against each IS code whether mentioned / not, latest version in the trade shall be implied.

Signature of Contractor

AGE (Contracts)  
For Accepting Officer

**APPENDIX 'A-2'****LIST OF PRODUCTS WHICH ARE GENERALLY SUPERIOR TO ISI CERTIFIED PRODUCTS TO BE INCORPORATED IN WORKS.**

1.	Glazed earthenware tiles	IS-777
2.	AC sheets	IS-459
3.	AC building pipes	IS-1626
4.	Paints	IS-2932
5.	Distemper, Oil emulsion and dry type	IS-8934
6.	Bathroom chromium plated, cast copper alloy, fancy bib taps, stop valves and pillar taps.	IS-8934
7.	Cement based paint	IS-9410

Signature of Contractor

DATED: \_\_\_\_\_

AGE (Contracts)

For Accepting Officer

**APPENDIX. 'C'**  
**CEMENT SUPPLY & ACCEPTANCE REGISTER**

1. CA NO & Name of work:
2. Control No\* :
3. Name of Manufacturer/Brand/Gde of Cement (A) Manufacturer \_\_\_\_\_ (B) Brand \_\_\_\_\_ (C) Grade :
4. Qty of cement & Lot No/Week No (in bags) : (A) (Qty \_\_\_\_\_) (B) Lot No/Week No \_\_\_\_\_
5. Manufacturer's test certificates no \_\_\_\_\_
6. Random Test details (a) Physical test report from \_\_\_\_\_ vide their letter No \_\_\_\_\_ (Name of approved Lab/Engg College)  
(b) Chemical test report from \_\_\_\_\_ vide their letter No \_\_\_\_\_ (Name of approved Lab/Engg College)
7. Details of Physical & Chemical properties :

	Specific Surface Area (m <sup>2</sup> per Kg)	Soundness by Le Chatellar	Soundness by Auto Clave	Initial Setting Time (Minutes)	Final Setting Time (Minutes)	Compressive strengths			Temp during testing °C	Standard consistency (%)	Lime Saturation (Ratio)	Aclumina Iron Ratio	Insoluble ratio (%)	Magnesium (%)	Sulphuric Anhydride (%)	Loss on ignition (%)	Alkalies (%)	Chlorides (%)
						03 days	07 days	28 days										
As per relevant IS																		
As per manufacturer's test certificate																		
As per random test certificate																		

Remarks with Signature :

Accepted/Rejected

Contractor

Junior Engineer

Engineer-in-Charge

Garrison Engineer

Remarks of BOO/Inspecting Officer/CWE

\* To be allotted serially by GE consignment wise