

## Part II

### Draft Form of Contract

for

Interior Works of Business and Exhibition  
Centre (BEC) building in ABCD Complex in  
Dholera Special Investment Region, Dholera

Dholera Industrial City Development Limited (DICDL)

6th Floor, Block No. 1 and 2, Udyog Bhavan,  
Sector-11, 'GH-4' Circle, Gandhinagar – 382017  
Gujarat, India

May' 2018

Program Manager for New Cities (PMNC)

**AECOM**

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## Section 1. Standard Form of Contract

### STANDARD FORM OF CONTRACT

CONTRACT FOR

Between

[Name of Employer]

[Name of Contractor]

[Date]

## **I Draft Form of Contract**

Contract to undertake [name of assignment]

This CONTRACT (hereinafter called the “Contract”) is made on the [Date in words] day of the month of [month] [year in ‘yyyy’ format], by and between

The Dholera Industrial City Development Limited, a company incorporated under the Companies Act, 1956, having its Registered Office at 6th Floor, Block No. 1 and 2, Udyog Bhavan, Sector-11, ‘GH-4’ Circle, Gandhinagar – 382017 Gujarat, India, hereinafter referred to as the “Employer” which expression unless repugnant to context or meaning thereof shall include its successors, affiliates and assigns) of the First Part.

AND,

[Name of Contractor and registered address]

(Hereinafter called the “Contractor”) which expression unless repugnant to context or meaning thereof shall include its successors, affiliates and assigns) of the Second Part

WHEREAS

- a) The Employer has requested the Contractor to provide certain consulting services as defined in the General Conditions attached to this Contract (hereinafter called the “Services”);
- b) The Contractor, having represented to the Employer that they have the required professional skills, personnel and technical resources, have agreed to provide the services on the terms and conditions set forth in this Contract.

NOW THEREFORE the parties hereto hereby agree as follows:

- a) The following documents attached hereto shall be deemed to form an integral part of this Contract:
- b) The General Conditions of Contract (hereinafter called “GC”);
- c) The following Appendices:
  - Appendix A: Bill of Quantities (BOQ)
  - Appendix B: Copy of Letter of Award
  - Appendix C: Copy of letter of Award/ acceptance by Consultant
  - Appendix D: Specifications
  - Appendix E: Copy of Bank Guarantee for Performance Security and insurances
  - Appendix F: Response to queries and Addendum issued during bid processing
  - Appendix G: Correspondences

1. The mutual rights and obligations of the Employer and the Contractor shall be as set forth in the Contract; in particular:
  - a) The Contractor shall carry out the work in accordance with the provisions of the Contract; and
  - b) Client will make payments to the Contractor in accordance with the provisions of the Contract.
2. Priority of documents: The Parties expressly agree that in the event of any conflict, inconsistency or contradiction between any clauses forming part of the documents constituting the Contract, and more particularly mentioned in Clause 1 (of this contract) hereinabove, the documents shall be interpreted in the following order of precedence:
  - a) The provisions of this Contract shall override all provisions of other documents comprising the Contract.
  - b) the provisions of the GCC shall be subject to the Contract, but shall override all provisions of other documents comprising the Contract;
  - c) the Appendices shall subject to each of the Contract, and the GCC.
  - d) Any decision of the Client in relation to the priority of documents shall be final and binding upon the Contractor.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names as of the day and year first above written.

FOR AND ON BEHALF OF DICDL

[Signature]

[Name]

[Designation]

FOR AND ON BEHALF OF CONTRACTOR

[Signature]

[Name]

[Designation]

Witness:

1. [Signature, name and address]

2. [Signature, name and address]

## **II General Conditions of Contract**

### **1.1 Definitions**

In the contract (as hereinafter defined) the following words and expression will have the meanings hereby assigned, to them:

- a. Approved/ Approval means approved in writing.
- b. Construction plant means all equipment, appliance or things of whatsoever nature required for the execution, completion or maintenance of the works or temporary works but do not include materials or other things intended to form or forming part of the permanent work.
- c. Contract means the contract Agreement entered between the Employer and Contractor. The instruction and information, general rules and direction for tenderers, terms and conditions of contract, specification, drawings, the schedules of quantities and tender prices, the formal agreement and all addenda (including corrigendum if any) and attachments related to the above, referred in the contract agreement shall constitute the contract.
- d. Contractor means the particular person, firm or Company or Group of firms or Companies or his designated representative with whom the contract has been made for executing the works and includes his legal successors.
- e. Day means a day from midnight to midnight.
- f. Defects liability period shall mean 24 (Twenty ) months from the certified date of completion. (The certified date of completion shall be in accordance with Clause – 1.43.).
- g. Drawings means the drawings referred to in the specifications, any modification of such drawings approved in writing and such other drawings as may from time to time be furnished or approved in writing by the Employer.
- h. Employer/ Owner mean Dholera Industrial City Development Ltd and include its legal successor.
- i. Employers Representative: Person/Agency appointed by the Employer to Discharge its Obligations under this Contracts.
- j. IS means Indian Standards, prescribed by the Bureau of Indian Standards
- k. Month means period from the beginning of a given date of a calendar month to the end of the preceding date of the next calendar month.
- l. Site means the lands and other places on, under, in or through which, the works are to be executed or carried out and any other lands or places provided by the owner for the purposes of the contract together with such other places as may be specifically designated in the contract or subsequently approved as forming part of site.
- m. Temporary Works means all temporary works of every kind required for the performance of the contract.

- n. Tendered Amount means the total tender amount indicated in the letter of acceptance of the tender.
- o. The expression “work” or “Works” where used in these conditions shall, unless, there be something in the subject or context repugnant or such construction be construed to mean the work, or the works contracted to be executed under or in virtue of contract, whether temporary or permanent, and whether original, altered, substituted or additional.
- p. Week means seven consecutive days.
- q. S.O.R. means schedule of rates.

## **1.2 Interpretations**

Words imparting the singular only, also include the plural, he include she and vice a versa unless this is repugnant to the context. Wherever the term “Specification” is used apart from a specified standard specification, it shall mean the specification or plan prepared for a particular item as per the instruction to the Contractor in executing that item of works.

## **1.3 Language of Contract**

All written matter and correspondence in connection with the Contract shall be in English.

## **1.4 Contract Document and Matters to be treated as Confidential**

All documents, correspondence, decision and order concerning the contract shall be considered as confidential and/or restricted in nature by the Contractor and he shall not divulge or allow access to them by any unauthorized person.

## **1.5 Stamp Duty**

The Stamp Duty for entering into agreement shall have to be paid by the Contractor.

## **1.6 Performance security**

- a. The Contractor shall, for the performance of its obligations hereunder during the Construction Period, provide to the Employer, within 30 (Thirty) days of the date of issue, of letter accepting the tender, an irrevocable and unconditional guarantee from a Bank in the form set forth in Part II, section 2 Annexure I (the “**Performance Security**”) for an amount equal to 5% (Five Percent) of the Contract Price.
- b. In addition to the above, the Employer shall deduct security deposit from the intermediate bills i.e. the running account bills an amount at the rate of 5% (five percent) of the total amount of each bills, as a remaining Security Deposit subject to the condition that the total amount of such deductions shall not exceed 5% (Five percent) of the Tendered amount put to Tender as mentioned in the letter of acceptance of the tender.
- c. The Bank Guarantee must remain valid for at least three months after the Defect Liability Period is over.
- d. Fifty percent (50%) of the Security Deposit less any amount due shall be returned to the contractor after completion of the Works as per clause no 1.43 and the remaining Fifty percent (50%) of the security deposit shall be returned only after three months of the

defect liability period is over and subject to the Employer certifying that no liability is attached to the contractor.

- e. Additional security deposit shall be furnished by the bidder as decided by the Employer's authority at the time of entering into contract, if any.

## **1.7 Actions When Performance Security is forfeited**

1.7.1 In any case, in which under any clause or clauses of this contract, the Contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit (Whether paid in one sum or deducted by instalments) or in the case of abandonment of the work owing to serious illness or death of the Contractor or any other cause, the Employer's Representative on behalf of the Employer, shall have powers:

- a. To rescind the contract (of which rescission notice in writing to the Contractor under the hand of Employer's Representative shall be conclusive evidence) and in that case the security deposit of the Contractor shall stand forfeited and be absolutely at the disposal of the Employer.
- b. To employ labour paid by Employer and to supply materials to carry out work , or any part of the work, debiting the Contractor with the cost of the labour and the price of the materials (as to the correctness of which cost and price, the certificate of the Employer's Representative shall be final and conclusive against the Contractor) and crediting him with the value of the work done in all respects in the same manner and at the same rate as if it had been carried out by the contractor under the terms of this contract and in that case the certificate of the Employer's Representative to the value of the work done shall be final and conclusive against Contractor.
- c. To order that the work of the Contractor be measured up and to take such part thereof as shall be unexecuted out of hands, and to give it to another Contractor to complete, in which case any expenses which may be incurred in excess of the sum which would have been paid to the original Contractor if the whole work had been executed by him (as to the amount to which excess expenses the certificate in writing of the Employer's Representative shall be final and conclusive) shall be borne and paid by the original contractor and shall be deductible from any money due to him by the Employer under this contract from his security deposit or the proceeds of sale thereof or a sufficient part thereof.

1.7.2 In the event of any of the course being adopted as per clause 1.7.1 above by the Employer's Representative, the Contractor shall not claim to compensate for any loss sustained by him by reason of his having purchased or procured any materials, or made any advances on this account or with a view to the execution of the work or the performance of the contract and in case the contract shall be rescinded under the provision aforesaid, the Contractor shall not be entitled to recover or be paid any sum for any work thereof actually performed by him under this contract unless and until the Employer's Representative shall have certified in writing the performance of such work and the amount payable in respect thereof and shall only be entitled to be paid amount so certified.

1.7.3 If the Contractor is an individual or a proprietary concern and the individual or the proprietor dies than unless the accepting authority is satisfied that legal heirs or representatives of the individual Contractor or of proprietary concern, are capable of carrying out and complete the contract, as the accepting authority shall be entitled to cancel the contract, as to its uncompleted part by forfeiting the security deposit under clause 1.7.1(a) without Employer being in anyway liable to pay any compensation to the heirs of the deceased contractor on

account of the cancellation of the contract. The decision of the Accepting Authority that the legal representatives of the deceased contractor cannot carry out and complete the contract shall be final and binding on the parties. In the event of such a cancellation, Employer shall not hold the heirs of the deceased Contractor liable for damages for not carrying out the work remaining incomplete as on the date of death of individual Contractor or the proprietor.

- 1.7.4 In any case in which any of powers conferred upon the Employer's Representative under clause 1.7.1 hereof shall have become exercisable and the same shall not have been exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable at any future date.
- 1.7.5 In the event of the Employer's Representative taking action under clause 1.7.1 to 1.7.4 he may if so desires, take possession of all or any tools, plants, machineries, materials and stores in or upon the work or the site thereof or belonging to the Contractor or procured by him and intended to be used for the execution of the work or any part thereof, by paying or allowing for the same in account at the contract-rate or in case of contract rates not being applicable at such reasonable rates, as may be comparable with current market rates where ascertainable of similar articles and comparable condition, to be certified by the Employer's Representative. In the alternative the Employer's Representative may by notice, in writing to the Contractor or his clerk of the works. Foreman or other authorized agent require him to remove such tools, plants, machineries, materials or stores from the premises within a time to be specified in such notice and in the event of the Contractor failing to comply with any such requisitions, remove them at the Contractor's expenses or shall remove them by auction or private sale at the risk and cost of the Contractor in all respect, and the certificate of the Employer's Representative as to the expenses of any such removal and the amount of the proceeds shall be final and conclusive against the Contractor.

## **1.8 Setting Out**

The Contractor shall establish at his cost reference points, reference lines and bench marks at suitable points as may be considered necessary by the Employer's Representative. The Contractor shall be responsible for the proper setting out of the works and the correctness of positions. Levels, dimensions and alignments of all parts of the work and for the provision of all necessary instrument, appliance and labour in connection therewith. If, at any time, during the progress of the work any errors, appear or arise in the positions, levels, dimensions or alignments of any part of the work, the contractor on being required to rectify such errors by the Employer's Representative shall rectify it at his own expense to the satisfaction of the Employer's Representative. The checking of and setting out of any line or level by the Employer's Representative or the representative shall not in any way relieve the contractor of his responsibilities for the correction of the error. The Contractor shall carefully protect and observe all bench marks, site nails, pegs and other things used in setting out of the work(s).

## **1.9 Progress Schedule**

- a. The Contractor shall furnish to the Employer's Representative within one week micro level planning from the date of the order to start the work, the progress schedule in quadruplicate indicating the date of starting, the monthly progress expected to be achieved and the anticipated completion date of each major item of work to be done by him, also indicating dates of procurement and setting up the materials, plants and machinery. The schedule should include a statement of proposed general and detailed arrangements for carrying out works, and of item, order and manner in which it is proposed that these shall be executed. The schedule should be framed keeping in view the requirement of the terms and conditions and be such as in practice to the achievement

towards completion of the work in the time limit and of the particular items on the dates specified in the contract and shall have the approval of the Employer's Representative. Further, the dates for the progress, indicated in the schedule shall be adhered to.

- b. The Employer's Representative shall have, at all times, the right, without in any way vitiating this contract forming grounds for any claim, to alter the order of the work or any part thereof and the Contractor shall after receiving such direction, proceed in the order directed. The Contractor shall also revise the progress schedule accordingly and submit four copies of the revised schedule to the Employer's Representative within seven days of the said Engineer's direction to alter the order of works.
- c. The Contractor shall furnish sufficient plant, equipment and labour and shall work such hours and shifts as may be necessary to maintain the progress of the works as per approved progress schedule. The working and shift hours shall comply with all the Employer's regulations in force and shall be such, as may be approved by the Employer's Representative and the same not be varied without the prior approval of Employer's Representative.
- d. The Contractor shall from time to time as may be required by the Employer's Representative, furnish the Employer's Representative with a statement in writing of the arrangements he proposes to adopt for the execution of this contract and the Employer's Representative, may if he considers necessary at any time advice alteration in the same, which the Contractor shall adopt on notice thereof.
- e. The progress schedule(s) shall be in the form of progress chart, forms, statements and/ or reports prepared in latest version of Microsoft Project or Primavera as may be approved by the Employer's Representative.
- f. In case it is found necessary, at any stage to alter the schedule, the Contractor shall submit in good time a revised schedule incorporating necessary modifications proposed and get the same approved from the Employer's Representative.

Revised schedule shall not be operative without such acceptance in writing. The Employer's Representative is further empowered to ask for more detailed schedule or schedules say week by week, for any item or items and the Contractor shall supply the same as and when asked for. The approval of the progress-schedules by the Employer's Representative shall not relieve the contractor of any of his duties, responsibilities under the contract. The adoption of any modification in the schedule required by the Employer's Representative shall not entitle the Contractor to any extra payment. The contractor shall submit four copies showing the progress of work in the form of a chart etc. at periodical intervals as may be specified by the Employer's Representative.

#### **1.10 Action when the progress of the work is unsatisfactory**

If the progress of any particular portion of the work is unsatisfactory, the Employer's Representative shall, notwithstanding that the general progress of the work is satisfactory, in accordance with clause 1.56, be entitled to take action under clause 1.7.1(b) after giving the Contractor 10 days' notice in writing and the Contractor will have no claim what so ever for any compensation or loss sustained by him in owing to such action.

### **1.11 Commencement of work, Time for completion and extension of time**

The contractor shall commence the work immediately upon the receipt of letter of Award (LOA) and proceed in accordance with the time schedule furnished pursuant to Clause 1.9 and complete the work in all respects within 03 (Three) months from notification of award. If the contractor desires for an extension of time for completion of the work on the ground of his having been unavoidable hindered in its execution or any other ground, he shall apply in writing to the Employer's Representative before the expiry of the period stipulated in the tender or the expiry of 30 days from the date on which he was hindered whichever is earlier and the Employer may, if in their opinion, believes that there are reasonable grounds for granting the extension, grant such extension, as he thinks necessary or proper. The decision of the Employer in this matter shall be communicated to the Contractor by the Employer's Representative and shall be final.

### **1.12 Action where no specifications**

1.12.1 In the case of any type of work for which there is no specifications, such work shall be carried out in accordance with the Employers specifications and in the event of there being no Employers specifications, then, in such case the work shall be carried out in all respects in accordance with the instructions, and requirements of the Employer's Representative.

1.12.2 Purpose of Drawings and specifications and conformance thereto shall be treated as under:

- a. The contract drawings read together with the contract specifications are intended to show and explain the manner of executing the work and to indicate the type or class of materials to be used.
- b. The work shall be carried out in accordance with the directions of the Employer's Representative in accordance with such further drawings, details and instructions as may be given by the Employer's Representative, from time to time.
- c. It shall be the responsibility of the contractor to promptly bring to the notice of the Employer's Representative any error or discrepancy in the contract documents and obtains his orders thereon. Only stated dimensions are to be taken and not those obtained from scaling the drawings. In case of any discrepancy between the description of an item in the Appendix-A and the specifications, the later shall prevail and in case any discrepancy between the specification and drawings, the drawings shall prevail. In case any feature of the work is not fully described and set forth in the item drawings and specification, the contractor shall forthwith apply to the Employer's Representative for further instructions, drawings or specifications.

1.12.3 Modifications

- a. The Employer's Representative may order modifications at any time before completion of the work. No modification shall be made unless so ordered in writing.
- b. For all modification, the Employer's Representative will issue revised plans.

#### 1.12.4 Signed Drawings – No Authority to the contractor

Signed drawings alone shall not be deemed to be an order for the work unless it is entered in the agreement or schedule of drawings under proper attestation of the contractor and the Employer's Representative or unless it has been sent to the contractor by the Employer's Representative with a covering letter conforming that the drawings is an authority for the work under the contractor.

#### 1.12.5 Copies of drawings and specifications

Copy of the typical modified or supplementary drawings and the specifications shall be furnished to the contractor.

### **1.13 Land required by the Contractor**

The Contractor shall have to make his own arrangement for land required by him for his camp, workshops, labour camps, stock-piling of materials and machineries etc.

### **1.14 Entering Upon or Commencement of Work**

The contractor shall not work upon or commence any portion of work except with the written authority and instruction of the Employer's Representative of the work, failing which the contractor shall have no claim to ask for measurement or payment for work.

### **1.15 Accesses to Site and Work**

The Employer/ Employer's representative may, if he consider fit from time to time, enter upon any land(s), which may be in possession of the Contractor under this contract for the purpose of executing any work not included in this contract and may execute such work not included in this contract by agents or by other Contractor in his opinion and the Contractor shall, in accordance with the requirements of the Employer's Representative, afford all reasonable facilities for execution of the work including occupation of lands by structure or otherwise for any other Contractor employed by the Employer and his workmen or for the workmen of the Employer who may be employed in the execution on or near the site of the work not included in the contract or of any contract-in connection with or ancillary to the work and in default, the Contractor shall be liable to the Employer for any delay or expense incurred by reason of such default, provided always that if the exercise of these powers shall cause any damage to the construction, he may, within, fifteen days of such damage arising make statement of the same to the Employer's Representative who shall, from time to time, assess the value in his judgment of such damage and the Employer shall from time to time pay to the Contractor the amounts (if any) accepted as justified by the Employer's Representative.

### **1.16 Works to be executed under direction of Employer's Representative**

All works to be executed under the Contract shall be executed under the direction of Employer's Representative and subject to approval in all respect of the Employer who shall be entitled to direct at what point or points and in what manner they are to be commenced and from time to time carried on.

## **1.17 Materials and Workmanship**

### 1.17.1 Materials

- a. All materials, articles and workmanship shall be of the most suitable quality for the work. The unit rates quoted shall deem to have included procurement, transport, handling, storage etc.

- b. Equivalency of Standards and Codes

Wherever reference is made in the Contract to the respective standards and codes in accordance with which goods and materials are to be furnished, and works is to be performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly set forth in the Contract. Where such standards and codes are national in character, or relate to a particular country or region, other authoritative standards which ensure an equal or higher quality than the standards and codes specified will be accepted subject to the Employer's Representative prior review and written approval. Differences between the standards specified and the proposed alternative standards must be fully described in writing by the Contractor and submitted to the Employer's Representative at least 30 days prior to the date when Contractor desires the Employer's Representative's approval. In the event the Employer's Representative determines that such deviations do not ensure equal or higher quality, the Contractor shall comply with the standards set forth in the contract documents.

- c. The Contractor shall without extra cost provide sample for the testing of materials and facilitate inspection of the works. The Employer's Representative shall have access at all times to the places of storage and to the places where materials are being manufacture or processed for use on the works under the Contract, to determine whether their manufacture and process are proceeding in accordance with the drawings and specifications.
- d. All materials, articles shall be specified and in accordance with the instructions of Employer's Representative.

### 1.17.2 Workmanship

The Contractor shall execute the whole and every part of the work in substantial and workman-like manner and both as regards materials and in other respects in strict accordance with specifications. The Contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing for the work signed by the Employer's Representative.

The Contractor will be entitled to receive the certified copy of the accepted tender along with the work order free of cost and will also be entitled to receive, on request two sets of working drawings, according to the progress of work, as and when needed, free of cost.

### 1.17.3 Employment of Qualified Engineer

The contractor shall employ a full time technically qualified staff during the execution of this work. The engineers so employed for the work must have sufficient experience to handle the work independently. Such Engineers shall have to stay at the site of work and they shall not be entrusted with any other duty except of this work.

Even if the contractor or a partner of the contractor, firm is a graduate Civil Engineer, employment of adequate number of engineers will however be necessary for the execution of the work on site as may be decided by the Employer's Representative.

1.17.4 Work to be open for inspection - Contractor or Responsible Agent to be present

All works under or in course of execution or executed in pursuance of the contract shall, at all times be open for the inspections and supervision of the Employer's Representative and his sub-ordinate and the contractor shall, at all times during the usual working hours and all other times at which reasonable notice of the intimation of the Employer's Representative or his sub-ordinate to visit the works shall have been given to the Contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing present for that purpose. Orders given to the Contractor's duly authorized agent shall be considered to have the same force and effect as if they had been given to the Contractor himself.

1.17.5 Notice to be given before work is covered up

The contractor shall give not less than five days' notice in writing to the Employer's Representative or his subordinate in charge of the work before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof taken before the same is so covered up or placed beyond the reach of measurement, any work without the consent in writing of the Employer's Representative or his sub ordinate in charge of the work and if any work shall be covered up or placed beyond the reach of measurement without such notice having been given or consent obtained, the same shall be uncovered at the Contractor's expense and in default there of no, payment or allowance shall be made for such work or for the materials with which the same was executed.

1.17.6 Action and Compensation for Bad Work

If at any time before the expiry of Defects Liability period as detailed in clause 1.17.7, it shall appear to the Employer's Representative or his sub-ordinate in charge of the work, that any work has been executed with unsound, imperfect or unskilled workmanship or with materials of inferior quality or that any materials or articles provided by him for execution of the work are unsound., or of a quality inferior to that contracted for or are otherwise not in accordance with the contract, it shall be lawful for the Employer's Representative to intimate this fact in writing to the Contractor and then notwithstanding the fact that the work, materials or articles complained of may have been passed. Certified and paid for, the Contractor shall be bound forthwith to rectify, or remove and reconstruct the works so specified in whole or in part as the case may be required or if so required shall remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost, and in the event of his failing to do so within a period to be specified by the Employer's Representative in the written intimation aforesaid, the Contractor shall be liable to pay compensation at the rate of one percent of the amount of the estimate of the rectification for every day not exceeding ten days during which the failure so continues and in the event of any such failure as aforesaid continuing beyond ten days, the Employer's Representative may rectify or remove and re-execute the work or remove and replace the materials complained as the case may be at the risk and expense in all respects of the Contractor. Should the Employer's Representative consider that any such inferior work or materials as described above may be accepted or made use of, it shall be within his discretion to accept the same at such reduced rates as he may fix thereof. However, the contractor shall be responsible for normal maintenance of the work till the final bill for the work is prepared by the Employer.

#### 1.17.7 Defect Liability Period

The contractor shall be responsible to make good and remedy at his own expense any defect which may develop or may be noticed before the period mentioned hereunder from the certified date of completion. The Employer's Representative shall give a notice in writing to the contractor about the defect and the Contractor shall make good the same within 15 days of receipt of the notice. In the case of failure on the part of the contractor, the Employer's Representative may rectify or remove or re-execute the work at the risk and cost of the Contractor. The Employer's Representative shall be entitled to appropriate the whole or any part of the amount of security deposit towards the expenses, if any, incurred by him in rectification, removal or re-execution. The Defects Liability period shall be 24 Months from the certified date of completion (The certified date of completion shall be as per clause 1.43)

### 1.18 Testing of Materials

- a. All materials before being utilized in works shall be inspected and tested, if found necessary, by the Employer's Representative or his representative. The nature of testing and periodical intervals at which such testing is to be done etc. shall be as per the latest editions of relevant IS Codes and determined by the Employer's Representative. The day-to-day and periodical tests to be carried out on materials mixes and placed concrete, mortar etc. shall be specified by the Employer's Representative from time to time and the Contractor shall provide free of cost all facilities towards collections of samples etc. unless otherwise specified. Labours for collecting samples and transportation of the samples to quality control authorities for test shall be provided free of cost by the contractor. Also electricity, fuel, water curing tank and stores etc. shall be provided free of cost by the contractors.
- b. The materials shall be tested at any place directed by the Employer's Representative. The Contractor shall obtain the test results from the concern authority and the results given by such authorities shall be considered to determine whether all materials, workmanship are of respective standard described in contract and in accordance with the instructions of the Employer's Representative. The Contractor's representatives shall, however, be given access to all operations and tests that may be carried out as aforesaid so that he may satisfy himself regarding the procedure and methods adopted. It shall then be the Contractor's responsibility to produce on the work, materials and finished item to the standard as determined by the laboratory tests or to take follow up action to rectify the quality.

All Testing charges shall, however, be borne by the Contractor.

- I. When the supply of the samples and the carrying out of such test at Contractor's cost is provided for or clearly intended in the Contract and is carried out either at the site of work or at place of manufacturer.
- II. When the supply of the samples and the carrying out of such tests is not provided for or clearly intended in the contract, but on testing the material is found defective and has to be rejected.
- III. Testing charges for testing of Cement, TMT bars, RCC pipes, M.S. pipes and all materials to be used in the works including cost of samples and its collection shall be borne by the Contractor.

- c. The Contractor shall, however, supply all materials, required for tests and also make good at his cost, materials, mixes and bore/ core hole with similar or other materials as may be directed by and to the satisfaction of the Employer's Representative.
- d. The Contractor shall make suitable arrangements to see that one of his representatives remains present at the time of taking samples and shall authenticate the facts. If the Contractor, fails to keep his representative present at site at the time of taking samples or fail to provide required labours and other equipment to collect the samples, the same shall be taken by the Employer, and the samples selected shall be considered as authentic. The cost incurred by the Employer when the Contractor fails to provide required men and materials for collecting samples and or their transport shall be recovered from the Contractor.

## **1.19 Quality Assurance**

### **1.19.1 Assurance Programme**

In addition to the testing procedure as laid down in clause -1.18 (Testing of Materials), the contractor shall submit a detailed field Quality Assurance Programme containing the overall quality management and procedures which he proposes to be followed during various phases of constructions as detailed in the relevant clause of the technical specifications of the contract and get it approved from the Employer's Representative within week after the letter of intent is issued. This shall include arrangements of testing apparatus/ instruments covering the requirements of items envisaged in the contract and details of the testing programme. The documents of Quality Assurance Programme shall generally cover but not limited to the following:-

- I. Contractor's organizational structure for the management and implementation of the quality assurance programme.
- II. Sources of various materials.
- III. Inspection and test procedure, both for material and their product and field activities.
- IV. System of handling storage and delivery of material.
- V. Laboratory testing facilities along with test of equipment's proposed to be installed along with a laboratory building plan.
- VI. System of preparation and maintenance of test records.

The Quality Assurance Programme shall also include the programme proposed to be followed by his sub-contractor. Contractor shall bear all cost / expenditure for implementation of provisions made under quality assurance clause.

### **1.19.2 Testing of Materials**

All materials, before bringing to the site of work shall be inspected and tested by the Contractor. For testing, the contractor may set up his own laboratory at his own cost. The place (Laboratory) of testing should be got approved from Employer's Representative. Test results shall be furnished by the contractor to the Employer's Representative. The cost of all such testing shall be borne by the contractor.

After materials are brought to site, if necessary, Employer's Representative or his sub – ordinate shall test in accordance with relevant clauses of contract. In case of discrepancy in the Employer's and contractor's results, the Employer's result shall be final and binding to the contractor. Materials which test result does not conform to the standards and is not acceptable to the Employer's Representative, shall be rejected and removed from the site.

#### 1.19.3 Testing Procedure

The Contractor shall carryout all sampling and testing in accordance with the relevant Indian Standard and / or International Standard or as stipulated in the contract, where no specific testing procedure is mentioned, the test shall be carried out as per the prevalent accepted engineering practice and direction of the Employer's Representative.

The Frequency of sampling and testing of all materials and products of construction shall be as mentioned in the technical specifications and relevant IS codes used in Practice. In case of discrepancy in the standards, the decision of the Employer's Representative will be final. In case due to changes in the codal provisions during course of execution if the acceptance criteria of the test gets changed, the Contractor shall have to follow the revised criteria of acceptance. The contractor shall not claim for any compensation as a result of rejection of his material or product of construction due to inferior quality on account of such changes. The testing frequencies set forth in different technical specification are the desirable minimum and Employer's Representative shall have a full authority to revise it as he finds necessary to satisfy himself that the quality of materials and the works together comply with appropriate specification requirement.

The ingredients of concrete got tested and approved by Employer's Representative in accordance with forgoing Para of this clause and clause 1.18 of this document.

- 1.19.4 The contractors shall have to use such materials which must fulfil the required qualities as per the specifications. The Employer is not going to compromise with the quality of the work in any case. The Employer may carry out in situ testing for the quality of earth, zoning of earthwork and other important components wherever required. The contractor will be held responsible for poor quality of work if the work is not done as per the specification.

### **1.20 List of Machinery to be brought and used on works by the Contractor**

The Contractor shall furnish list of machinery immediately available with him for use on the work and which they propose to procure for the work.

### **1.21 Construction at existing utilities**

- 1.21.1 Where the work to be performed under these specifications crosses or otherwise interferes with water, sewer, gas or oil pipelines, buried cable or other public or private utilities, the Contractor shall preserve and protect such utilities and shall perform such construction during the progress of the work so that no damage will result to either public or private interests till alternative arrangement for relocating such facilities are made. The term "Watercourses" included ditches, terraces, furrows or other features of surface irrigation systems

It shall be the responsibility of the Contractor to determine the actual locations of and make provision for all watercourses and utilities.

- 1.21.2 Before any watercourse or utility is taken out of service, permission shall be obtained from the Employer by the Contractor. The Contractor shall be liable for all damages that may

result from failure to preserve and protect watercourses or utilities during the progress of the work and the Contractor shall indemnify and hold harmless the Employer from claims of whatsoever nature or kind arising out of or connected with damage to water courses or utilities encountered during Construction, damages resulting from disruption of service and injury to persons or damage to property resulting from the negligent, accidental or intentional breaching of watercourses or utilities.

- 1.21.3 If the Contractor does not maintain the existing watercourse and utilities in such condition that no damage will result to either public or private interests, the Employer will make the necessary repairs to be made and recover charges from the Contractor for such work.
- 1.21.4 Except as otherwise provided below, the cost of all work described in this paragraph, shall be included in the price bid in the schedule for relevant other items of work.
- 1.21.5 Where construction of new structures or modification of existing structures are required to render the watercourses or utilities operative beyond the period of the Contract, the Contractor shall notify the Employer's Representative so that the arrangements can be made with the owners for the construction of modifications required. When it is determined that such works are to be performed by the Contractor, and such item of work is not provided for in the schedule, the Contractor shall perform the necessary work in accordance with clause 1.35.
- 1.21.6 In case of watercourses and utilities in addition to those for which details are available with the Employer, all additional work required to be performed by the Contractor as a result of encountering the watercourse or utilities shall be performed in accordance with clause 1.35.
- 1.21.7 In case of forest, nursery or plantation for which details are available with the Employer, all care shall be taken by the contractor to preserve the plantation during Construction. If the contractor does not take care to preserve the plantation, the Employer may recover the loss, from the contractor.

## **1.22 Construction at Telephone and Power line Crossings**

- 1.22.1 The details of telephone and power-line crossings are available with the office of the Employer's Representative. The concern authorities under agreement with the Employer will remove or raise these lines and relocate them permanently at other locations which will permit the Contractor to proceed with his construction operations without delay.
- 1.22.2 Equipment and vehicles shall not be operated where, it is possible to bring such equipment or vehicles or any part thereof within 5 meters of any high voltage line or installation unless Electricity company/Service provider, has been notified the line de-energized and grounded, and positive control measures taken to prevent points along the conductor will vary due to changing ambient and operating temperatures.
- 1.22.3 The Contractor shall notify Employer's Representative immediately when removal and/or raising and relocation of the utility are required so that he can proceed with construction of the M.S. Pipeline work and roadway relocation at that location in accordance with his sequence of operations. The Electricity company/Service provider, and Telephones Authorities under agreement with the Employer, will perform all work required before, during and after project work and road construction to remove, relocate, and maintain them in service at all times at no cost to the Contractor. The Contractor will not be required to perform any work for the crossings, but shall co-operate with The Electricity company/Service provider and Telephone Authorities so that they may perform the required work with as little interference from the Contractor's operations as is practicable.

1.22.4 If, for his convenience the Contractor wishes the Electricity company/Service provider, and Telephone Authorities to make temporary relocations or minor alterations at existing utility crossing, it will be the Contractor's responsibility to make arrangements with the Electricity company/Service provider, and Telephone Authorities for performing such work and the costs thereof shall be paid to the Electricity company/Service provider, and Telephone Authorities by the Contractor.

1.22.5 The Contractor shall provide for the utility crossings so that no damage will result there to.

### **1.23 Work during Night or on Sundays and Holidays**

The work shall not be carried out during night or on Sunday and authorized holidays without the prior written consent of Employer's Representative. However, it will be allowed to be carried out the work during night, Sundays or authorized holidays subject to:

- a. The provisions of relevant labour laws being adhered to.
- b. Adequate lighting, supervision and safety measures established to the satisfaction of the Employer's Representative.
- c. The Construction programme given by the Contractor and agreed upon by the Employer's Representative envisages such working.
- d. If it is necessary or required to ensure the safety of work, protection of life, or to prevent loss or damage to property.

### **1.24 Deleted**

### **1.25 Deleted**

### **1.26 Electric Power**

The contractor shall make his own arrangements for electric power supply at his own cost. The Employer shall not take any responsibility for power connection from Electricity Board. The Contractor shall provide and operate generating sets of suitable capacity at required locations at his own cost to meet with the situations arising out of interruptions of electric power supply either or short or long duration. The Contractor shall not raise any claim against the Employer for failure or stoppage of power supply for any reasons whatsoever. Demand charges and any other charges over and above energy charges as levied by the Electricity Company shall also be borne by the Contractor.

### **1.27 Other Contractors**

1.27.1 When two or more Contractors are engaged on work in the same vicinity, they shall work together in a spirit of co-operation and accommodation. The Contractor shall not take or cause to be taken any steps or actions that may cause disruptions, discontent or disturbance to the works, labour and arrangements of other Contractor in the neighbouring project localities. In case of any difficulties amongst the Contractors, the Employer's Representative shall direct the manner in which each Contractor shall conduct his works so far as it does not affects the others.

1.27.2 It is possible that work at, or in the vicinity of the site of work will be performed by the Employer or by other Contractors engaged in work for the Employer during the Contract period. The Contractor shall without charge permit the Employer and such other

Contractor's and other workmen to use the access facilities including roads, lighting installation and any other facilities constructed or acquired by the Contractor for use in the performance of the works till they are required to be maintained for the purpose of this work.

## **1.28 Ecological Balance**

1.28.1 The Contractor shall maintain ecological balance by preventing deforestation, water pollution and defacing of natural landscape. The Contractor shall so conduct his construction operations as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the work. In respect of ecological balance, Contractor shall observe the following instructions.

- a. Where unnecessary destruction, scarring, damage or defacing may occur as a result of the operations the same shall be repaired, replanted or otherwise corrected at the Contractor's expense. The Contractor shall adopt precautions when using explosives which will prevent scattering of rocks or other debris outside the work area. All work areas shall be smoothed and graded in a manner to conform to the natural appearance of the landscape as directed by the Employer's Representative.
- b. All trees and shrubbery which are not specifically required to be cleared or removed for construction purposes shall be preserved and shall be protected from any damage that may be caused by the Contractor's construction operations and equipment. The removal of trees or shrubs will be permitted only after prior approval of the Employer's Representative. Special care shall be exercised where trees or shrubs are exposed to injuries by construction equipment, blasting, excavating, dumping, chemical damage or other operation and the Contractor shall adequately protect such trees by use of protective barriers or other methods approved by the Employer's Representative. Trees shall not be used for anchorages. The Contractor shall be responsible for injuries to trees and shrubbery caused by his operations. The terms 'injury' shall include, without limitation, brushing scarring, tearing and breaking of roots trunks or branches. All injured trees and shrubs shall be restored as nearly as practicable without delay to their original condition at the Contractor's expenses.
- c. The Contractor's construction activities shall be performed by methods that will prevent entrance or accidental spillage of solid matter contaminants, debris and other objectionable pollutants and wastes into Canal. Such pollutants and wastes include earth and earth products, garbage, cement concrete, sewage effluent, industrial wastes, radioactive substances, mercury, oil and other petroleum products, aggregate processing, tailings much products, minerals, salts and thermal pollution. Pollutants and wastes shall be disposed off in a manner and at sites approved by the Employer's Representative.
- d. In the conduct of construction activities and operation of equipment's, the Contractor shall utilize such practicable methods and devices as are reasonably available to control, prevent and otherwise minimize air pollution.
- e. Excessive emission of dust into the atmosphere will not be permitted during the manufacture, handling and storage of concrete aggregate and the Contractor shall use such methods equipment as are necessary for collection and disposal or prevention of dust during these operations. The Contractor's method of storing and handling cement shall also include means of eliminating atmospheric discharge of dust. Equipment and vehicles that give objectionable emission of exhaust gases shall not be operated. Burning of materials resulting from clearing of trees, brush, combustible construction materials and rubbish may be permitted only when atmospheric conditions for burning are considered favourable.

- 1.28.2 Separate payment will not be made for complying with provisions of this Clause and all costs shall be deemed to have been included in costs of items included in Appendix 'A'.

### **1.29 Contractors Liability for Damage and Imperfection after Completion Certificate**

If the contractor or his workmen, or servant shall break, deface, injure or destroy any part of the work in question in / on which they may be working or any building, road, fence, enclosure or grass land or cultivated ground continuous to the premises on which the work or any part thereof is being executed or if any damage shall occur to the work from any cause whatever before completion of the work or before the completion of the Defect liability period whichever is later or damage occurred / caused due to normal flood or rain or if any imperfection become apparent in it within twelve months from grant of a certificate of completion, final or otherwise by the Employer's Representative the contractor shall make good the same at his own expenses or in default, the Employer's Representative may cause the same to be made good by other contractor and deduct the expenses (of which the certificate of the Employers' Representative shall be final) from any sums that may there after become due to the Contractor or from his security deposit or the proceeds of sale thereof or a sufficient portions thereof.

### **1.30 Liability of Contractor for Damage Done in or Out Side Work Area**

Compensation for all damage done intentionally or unintentionally by Contractor's labours whether in or beyond limit of the Employer's property including any damage caused by the spreading of fire shall be estimated by the Employer's Representative, or such other officer as he may appoint and the estimates of the Employer's Representative, subject to the decision of the Employer, on appeal, shall be final and the Contractor shall be bound to pay the amount of the assessed compensation on demand, failing which the same will be recovered from the Contractor as damages in the manner as decided by the Employer's Representative and deducted from any sums that may be due or become due from the Employer to the Contractor or under this contract or otherwise.

The Contractor shall bear the expenses of defending any action or other legal proceeding that may be brought by any person for injury sustained by him owing to neglect of precautions to prevent the spread of the fire and he shall also pay the damages and cost that may be awarded by the Court in Consequence.

### **1.31 Liability of Contractor for Accidents to Persons**

In addition to responsibilities and liabilities of the Contractor under workmen's Compensation Act given in clause 1.47 following shall also apply:

- a. On the occurrence of an accident, which results in death of workmen employed by the Contractor or which is as serious as is likely to result in death of any such workmen, the Contractor shall within 24 hours of happening of such accident(s), intimate in writing to the Employer's Representative, the fact of such accident(s). The Contractor shall indemnify the Employer against all loss or damage sustained by the Employer resulting directly or indirectly from his failure to give intimation in the manner aforesaid including the penalties or fines, if any, payable by the Employer as a consequence of Employer's failure to give notice under the Workmen's Compensation Act or otherwise to conform to the provisions of the said Act regard to such accident(s).
- b. In the case of an accident, in respect of which compensation may become payable under workmen's Compensation Act, whether by the Contractor or by the Employer, it shall be lawful for the Employer's Representative to retain out of money due and payable to the

Contractor such sum or sums of money as may, in the opinion of the Employer's Representative be sufficient to meet such a liability. The opinion of the Employer's Representative shall be final in regard to all matters arising under this Clause.

### **1.32 Liability of Contractor for Taking over Completed Portion of Work**

In the event the Employer takes over portions of works as they are completed, the liability of the Contractor for those portions shall extend to a period of twenty four months from the actual date on which such portions of the works were taken over.

### **1.33 Indemnities**

The Contractor shall indemnify the Employer against all actions, suits, claims and demands, through or made against the Employer in respect of work of this contract and against any loss or damage to Employer in consequence of any action or suit being brought against the Contractor for anything done or omitted to be done in execution of the work of this contract.

### **1.34 Variation of Quantities and Extra Items**

The Employer's Representative shall have authority to make any alterations in the original specifications, drawings, designs and issue instructions that may appear to him to be necessary or advisable during the progress of the work and the Contractor shall be bound to carry out the work in accordance with any instructions in this connection which may be given to him in writing and signed by the Employer's Representative and such alteration shall not invalidate the contract and additional work which the Contractor may be directed to do in the manner specified as part of the work shall be carried out by the Contractor on the same conditions in all respects on which he agreed to do the work and rate as specified below. The quantities shown in the tender are approximate and no claim shall be entertained for quantities of work executed being less than those entered in the Tender.

### **1.35 Variation in Schedule of Quantities**

#### **1.35.1 Increase in Quantities**

- a. If the quantity for any individual item increases by a quantity limited to 30 % of tender quantity, such quantity shall be executed and paid at tendered rate with price adjustment, if applicable. The contractor shall not undertake any excess beyond 30% / extra work without written orders from the Employer's Representative and any violations to this shall lead to non-payment to the contractor.
- b. No payment shall be entertained for excess quantity, if any, beyond the 30% of the tendered quantity (that means total 130% of the tendered quantity) until such executed quantity and the rates thereof are correctly derived afresh with mutual agreement and approved by the Employer.

#### **1.35.2 Decrease in Quantity**

If the quantity for any individual item decreases by more than 30% of tender quantity, such quantity i.e. executed quantity shall be paid at tendered rate with price adjustment, if applicable.

#### **1.35.3 Extra Item**

Extra item of work shall not vitiate the contract. The contractor shall be bound to execute extra items of work as directed by Employer's Representative.

No payment shall be entertained for extra item until such executed quantity and the rates thereon are correctly derived and approved by the Employer.

### **1.36 Lumpsum in Estimates**

When the estimate on which a tender is made includes lump sum in respect of part of the work, the Contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not in the opinion of the Employer's Representative capable of measurement, the Employer's Representative at his discretion, pay the lump sum amount entered in the estimate and the certificate in writing of the Employer's Representative shall be final and conclusive against the Contractor with regard to any sum or sums payable to him under the provisions of this clause.

### **1.37 Submission of Bills**

1.37.1 The Contractor on submitting a monthly bill therefore, be entitled to receive payment proportionate to the part of the work then approved and at the rates quoted in Appendix – A and passed by the Employer's Representative, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the Contractor.

All such intermediate payments shall be regarded as payments by way of advance against, the final payment only and not as payments for work actually done and completed and shall not preclude the Employer's Representative from requiring bad, unsound, imperfect or unskilled work to be removed and taken away and reconstructed or re-erected, nor shall any such payments be considered as an admission of the due performance of the contract or any part thereof in any respect or the accruing of any claims, not shall it conclude, determine or affect in any way the power of Employer's Representative as to the final settlement and adjustment of the accounts or otherwise or in any other way vary or affects the contract.

1.37.2 The rates for items of work shall be valid only when the item concerned is accepted as having been completed fully in accordance with the sanctioned specifications. In case where the items of work are accepted as not so completed, the Employer's Representative may make payment on account of such items at such reduced rates as he may consider reasonable in preparation of running account or final account bill.

1.37.3 A bill shall be submitted by the contractor each month on or before the date fixed by the Employer's Representative for all works executed in the previous month and the Employer's Representative shall take or cause to be taken the requisite measurements for the purpose of having the same verified and the claim so far as it is admissible, shall be adjusted within fifteen days from the submission of the bill. The contractor may submit more than one bill in a month provided the value of work done is equal or more than INR. 2 Crore.

1.37.4 The Contractor shall submit all the bills on the printed forms to be had on application at the office of the Employer's Representative. The charges to be made in the bills shall always be entered at the rates specified in the agreement or at the part / reduced rates subject to the approval by the Employer's Representative in the case of items not completed/executed as per agreements.

1.37.5 Payment to the Contractor shall be made within 45 days of receipt of the invoice and certification of the work done by the Employer's Representative in the approved format. However, the final bill payment shall be made on Completion of Completion of Works within 75 days of receipt of invoice by the Employer.

1.37.6 Amount due for recovery on other facilities as well as also for other services, water supply and electricity charges and for other expenditure, if any, incurred by the Employer on Contractor's behalf on labours and materials which may become due from the Contractor as per the Contract as well as under any other laws prevailing which may become due, will be recovered from the payments to the Contractor, as and when due.

### **1.38 Price Adjustment**

1.38.1 No Price Adjustment is applicable due to increase or decrease in input cost of the works.

1.38.2 Changes in cost due to legislation:

- a. If the law of any local or duly constituted authority, or the introduction of any such state statute, Ordinance, decree, law regulations or bye-law which causes additional or reduced cost to the contractor other than under the first two sub- clauses of the clause in the execution of the works, such additional or reduced cost shall be certified by the Employer's Representative after examining the records provided by the claimant and shall be paid by or credited to the Employer.
- b. Notwithstanding the foregoing such additional or reduced cost shall not be separately paid or credited if:
  - I. The same shall have been reflected in the indexing of any of the inputs to the price adjustment in accordance with the provision of this clause 1.38.
  - II. The same shall have been taken into account by any other clauses of the contract.

### **1.39 Deleted**

### **1.40 Non-Refund of Quarry Fees and Royalties**

The Contractor shall pay the royalty directly to the competent authority /local body as per rules and shall produce "No Due Certificate" from the Royalty Inspector having jurisdiction over the work site area to Employer's Representative. The royalty charges shall be borne by the contractor and shall not be refunded. The contractor shall produce 'no due certificate' once in a year as under:

- I. For time limit less than 1 year at the time of final bill and
- II. For time limit more than 1 year, after end of every year and at the time of final bill, otherwise the Employer's Representative shall deduct the royalty charges from the next running account bill at the prevailing rates.

### **1.41 Income Tax**

Deduction will be made at source from the contractor's bill towards income Tax by the Employers as per prevailing rules of the Income Tax Authority.

### **1.42 Taxes**

- 1.42.1 The rate quoted by the Contractor shall be deemed to be inclusive of all Taxes including GST prevailing as on 30 days prior to submission of bid where applicable on materials that have to be purchased for performance of the contract including completed items of work.
- 1.42.2 All the Taxes leviable for the work (including material component) under the Contract shall be borne by the Contractor and it shall not be reimbursed by the Employer.
- 1.42.3 Deleted.
- 1.42.4 Deleted
- 1.42.5 Difference of payment due to any upward revision of GST Taxes (Except on those components whose price rise is fully compensated as per Clause No. 4.38, Price Adjustment) during the period of contract shall be borne by the Employer. Such tax shall be paid by the Contractor and it will be reimbursed by the Employer upon production and verification of proof of payment. Similarly, in the event of reduction GST on any or all materials purchased by the Contractor for completion of the work under contract, the Contractor shall pass on this benefit to the Employer. For above purpose, the Contractor shall produce a certificate from their auditor/ Chartered Accountants/ Tax consultants giving year wise details of purchases, along with the proof. The Employer will reimburse or deduct as the case may be such amount, after scrutiny of the claim at the time of final payment of the bill.

### **1.43 Completion Certificate of Work and Final Payment**

As soon as the work is completed, in all respect as specified in the contract document the Contractor shall give a notice of such completion to the Employer's Representative and on receipt of such notice, the Employer's Representative shall inspect the work, and if he is satisfied that the work is completed in all respects then:

- I. The final measurements shall be recorded within 30 days from the date of physical completion of the work and the final bill shall be submitted by the contractor within 45 days from the date of recording final measurements, otherwise the Employer's Representative's certificate of the measurements and of the total amount payable for the work shall be final and binding on all parties.
- II. The completion certificate shall be issued within one months from the date of final measurements subject to the Contractor fulfilling his obligations as provided in the contract and subject to the work being complete in all respects. When separate periods of completion have been specified for items or groups of items, the Employer's Representative shall issue separate completion certificate for such items or groups of items.

No certificate of completion shall be issued, nor shall the work be considered to be completed till the Contractor shall have removed from the premises, on which the work has been executed, all scaffoldings, sheds and surplus materials, except such as are required for rectification of defects, rubbish and all huts and sanitary arrangements required for his workmen on the site in connection with the execution of the work, as shall have been created by the Contractor for the workmen and cleared all dirt from all parts of building(s) in, upon or about which the work has been executed or of which he may have/ had possession for the purpose of the execution thereof and cleared floors, gutters, and drains, cased doors and sashes oiled lock and fastenings, labelled keys clearly and handed them over to the Employer's Representative or his representative and made the whole premises fit for immediate occupation or use to the satisfaction of the Employer's Representative. If the Contractor fails to comply with any of aforesaid requirements of these on or before the date

of completion of the works, the Employer's Representative may, at the expense of the Contractor, fulfil such requirements and dispose of the scaffolding or surplus materials and rubbish etc. as he thinks fit and the Contractor shall have no claim in respect of any such scaffolding or surplus materials except for any sum actually realized by the sale thereof less the cost of fulfilling the requirements and any other amount that may be due from the Contractor. If the expense of fulfilling such requirements is more than the amount realized on such disposal as aforesaid, the Contractor shall forthwith, on demand, pay such excess. The Employer's Representative shall also have the rights to adjust the amount of excess against any amounts that may be payable to the Contractors. No Payment shall be entertained in the intervening period of last R.A. Bill and before the pre-audit of the final bill and before excess / extra item approved by the Employer.

#### **1.44 Errors, Omissions and Discrepancies**

1.44.1 The several documents forming the contract are essential parts of the contract and a requirement occurring in one is as binding as through occurring in all they are intended to be mutually explanatory and complementary and to describe and provide for a complete work. In the event of any discrepancy in the several documents forming the contract or in any one document, the following order of precedence should apply.

- I. Between the written description of the item in the Appendix-A or written dimensions on the drawing and the corresponding one in the specifications, the later shall apply.
- II. Figured dimensions shall supersede scaled dimensions. The drawing on a large scale shall take precedence over those on smaller scale.
- III. Drawing issued as construction drawings from time to time shall supersede the corresponding drawings previously issued.

In the case of defective description or ambiguity, the Employers representative is entitled to issue further instructions directing in what manner the work is to be carried out. The contractor shall point out any apparent error or omission in the tender documents while submitting the tender and particularly while signing the contract. The contractor cannot take any advantage of any apparent error or omission in the tender document and if the contractor fails to bring out the apparent error or omission to the notice of the Employer in writing, he shall have no right to claim which may arise due to such error or omission subsequently and the decision of the Employer in this regard shall be final and binding to the contractor.

1.44.2 Typographical error leading to absurdity shall be ignored and correct technical, financial and legal meaning of such errors shall be considered.

#### **1.45 Old Curiosities**

In the event of discovery by the contractor or his employees during the progress of work, of any gold, silver, oil or other minerals of any description and precious stones, treasures, coins, antiques, relic, fossil or other articles or value of interest whether geological, archaeological or any other such treasure and other things shall be deemed to be the absolute property of the Employer and the contractor shall duly preserve the same to the satisfaction of the Employer's Representative, from time to time and deliver the same to such persons as the Employer's Representative may appoint.

The Contractor shall take all reasonable precautions to prevent his workmen or any other person from removing or damaging any such articles or things, immediately after the

discovery there of and before removal acquaint the Employer's Representative with such discovery and carry out his order for the disposal of the same.

#### **1.46 Safety Provisions**

1.46.1 The Contractor in his operations shall arrange for the safety measure as required inclusive of the provisions in the latest safety manual published by the Central Water and Power Commission, New Delhi (January-1962 edition Reprinted in November 1986) In case the Contractor fails to make such arrangements, the Employer's Representatives shall be entitled to cause them to be provided and to recover the costs there of from the Contractor.

1.46.2 For failure to comply with the provisions of the Safety Manual the Contractor shall, without prejudice to any other liabilities, pay to the Employer a sum not exceeding Rupees one thousand per day for each day default.

#### **1.47 Labour Compensation under the Workman's Compensation Act**

a. The contractor shall be responsible for and shall pay any compensation to his workmen payable under the workmen's compensation Act 1923 (VIII of 1923) (hereinafter called the said Act) for injuries causes to the workmen. If such compensation is paid by Employer as principle employer under sub-section (1) of section 12 of the said Act, on behalf of the Contractor, it shall be recoverable by the Employer from the Contractor under sub-section (2) of the said section. Such compensation shall be recovered in the manner as decided by the Employer's Representative.

b. The Contractor shall be responsible for and shall pay the expenses of providing medical aid to any workmen who may suffer a body injury as a result of an accident. If such expenses are incurred by Employer, the same shall be recoverable from the Contractor forthwith and be deducted without prejudice to any other remedy of Employer from any amount due or that may become due to the Contractor.

c. The Contractor shall provide all necessary personal safety equipment and first aid apparatus available for the use of the persons employed on the site and shall maintain the same in suitable condition for immediate use at any time and shall comply with the following regulations in connection therewith:

I. The workers shall be required to use the equipment so provided by the Contractor and the Contractor shall take adequate steps to ensure proper use of the equipment by those concerned;

II. When work is carried out in proximity of any place where there is risk of drowning, all necessary steps shall be taken for the prompt rescue of any person in danger;

III. Adequate provision shall be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

d. Employment of famine or other labour. The Contractor shall employ any famine, convict or other labour of particular kind or class, if ordered in writing to do so by the Employer's Representative.

e. Details of labourers employed

I. The contractor shall not employ in connection with the works any person who has not completed his Eighteen (18) years of age.

- II. The Contractor shall furnish to the Employer's Representative information about various categories of labours employed by him in the form and at such interval as may be specified.
  - III. The contractor shall in respect of labour employed by him comply with or cause to be complied with the provisions of the various labour laws and rules and regulations as applicable to them in regard to all matters provided therein and shall identify the Employer in respect of all claims that may be made against the Employer for non-compliance thereof by the Contractor.
- f. Notwithstanding, anything contained herein the Employer's Representative may take such action as may be necessary for compliance of the various labour laws and recover the costs thereof from the Contractor.
- I. In the event of the Contractor committing a default or breach any of the provisions of the labour laws and rules and regulations applicable, the Contractor shall, without prejudice to any other liability under the Act, pay to Employer a sum not exceeding Rupees one thousand per day for each of the defaults subject to a maximum of one percent of the tendered amount.
- g. The Contractor should, as far as possible, obtain his requirement of labours, skilled and unskilled, from the nearest Employment Exchanges so as to utilize the local employment potential. If there are no local Employment Exchanges or such Exchanges are not able to provide the required labour locally, suitable available labours should be utilised to the maximum extent possible. The contractor shall have to engage local labour and person seeking employment where available on normal rate.
- h. Fair Wages
- I. If a Contractor fails to pay within '7' (Seven) days to any the labour(s)/worker(s) the minimum wages prescribed by the Government under the minimum wages Act 1948 as in force from time to time, the Employer's Representative shall be at liberty to deduct the amount payable by the contractor to the labour/worker from his (Contractor's) bills or deposit(s) after making due inquiries and establishing claims of the labour(s)/worker(s).
  - II. The Contractor shall not be entitled to any payment of compensation on account of any loss that the Contractor may have to incur on account of the action as aforesaid. Before the action as aforesaid, is enforced, a notice in writing to the Contractor shall be issued by the Employer's Representative to pay the wages as per Minimum wages Act in force at the relevant time. If Contractor does not act as aforesaid within seven days then the action contemplated as above shall be taken against him.
- i. Local labour on normal rates. The contractor shall have to engage local and person seeking employment where available on normal rates.

#### **1.48 Labour Reports**

The contractor shall submit the following reports to the Employer's Representative:

- I. A daily report in the form as may be prescribed of the strength of labour both skilled and unskilled employed by him on the work(s). The Contractor shall increase or decrease the strength both skilled and unskilled, if directed by the Employer's Representative. The

submission of such report shall not, however relieve the Contractor of his responsibilities and duties regarding progress or any other obligations under the contract.

- II. A classified weekly return in the prescribed form of the number of person employed on the works during the preceding week.
- III. A weekly medical report in the prescribed form showing the health of the Contractor's camp, the number of person ill or incapacitated and the nature of their illness.
- IV. A report of any accident, which may have occurred to be sent within 24 hours of the occurrence.

#### **1.49 Deleted**

#### **1.50 Employment of Scarcity Labour**

If Government declares a state of scarcity or famine to exist in any village situated within 16 kilometres of the work, the Contractor shall employ upon such parts of the works, as are suitable for unskilled labour, any person, certified to him by the Employer's Representative or by any persons to whom, the Employer's Representative may have delegated this duty in writing to be in need of relief and shall be bound to pay to such persons, wages not below the minimum which Government may have fixed in this behalf. Any dispute which may arise in connection with the implementation of the Clause shall be decided by the Employer's Representative whose decision shall be final and binding on the contractor.

#### **1.51 Insurance**

1.51.1 The Contractor shall secure and maintain throughout the duration of this Contract insurance of such types and in such amounts as may be necessary to protect himself against all the usual hazards or risks or loss. The form and limits of such insurance and the company together with the under writing thereof in each case, shall be such as will be acceptable to the Employer but, regardless of such acceptance, it shall be the responsibility of the contractor to maintain adequate insurance at all-time at least to cover:

- I. Workmen's compensation in accordance with the law in force from time to time.
- II. Third party liability including Employer's personnel on duty with a cover of minimum Rs. 5 lac for each person in case of fatal accident/permanent disability.
- III. All plant and equipment of the Contractor hypothecated to the Employer and all Employers material and machinery handed over to the contractor till they are properly installed.
- IV. Failure of the Contractor to maintain adequate insurance coverage shall not relieve him of any contractual responsibility.

1.51.2 Attested copies of certificate or policies of insurance shall be filed with the Employer prior to starting any construction work on this contract. The certificates shall state that fifty days advance written notice will be given to the Employer before any policy covered thereby is changed, cancelled or expired.

#### **1.52 Camp Regulations**

1.52.1 Huts

The Contractor shall build a sufficient number of huts on a suitable plot of land for the use of the labours according to the following specifications:

- I. Deleted.
- II. A good site shall be selected; high ground removed from jungle but well provided with trees shall be chosen wherever it is available. The neighbourhood of rank jungle, grass or weeds should particularly be avoided. Camp should not be established close to large cutting of earth-work.
- III. The lines of huts shall have open spaces of at least 10 m between rows. When good natural site cannot be procured, particular attention should be given to the drainage.
- IV. There should be no over-crowding floor spaces at the rates of 2.8 square meter per head shall be provided. Care should be taken to see that the huts are kept clean and in good order.
- V. The contractor must find out land for the hut and if he wants Employer land, he should apply for it and pay assessment for it.

#### 1.52.2 Drinking Water

The Contractor shall, as far as possible, provide an adequate supply of chlorinated pure potable drinking water for the use of labours. This provision shall be at the rate of not less than 45 litres per head.

#### 1.52.3 Deleted

#### 1.52.4 Deleted

#### 1.52.5 Drainage

The Contractor shall make sufficient arrangement for draining away the sewage water as well as water from the bathing and washing places and shall dispose of this waste water in such a way as not to cause nuisance. The Contractor would put malarial oil once in a week in stagnant water round about the residence.

#### 1.52.6 Medical Facilities

The Contractor shall engage a medical officer with a travelling dispensary for a camp having 500 or more persons if there is no Government or other private dispensary situated within 6 Km from the camp.

#### 1.52.7 Conservancy and Cleanliness

The Contractor shall provide the necessary staff for effecting the satisfactory conservancy and cleanliness of the camp to the satisfaction of the Employer's Representative.

#### 1.52.8 Health Provisions

The District Health Officer of the District or the Deputy Director of Health Services shall be consulted before opening a labour camp and his instructions on matters, such as water supply, sanitary convenience, camp-site, accommodation and food supply shall be followed by the Contractor.

1.52.9 Deleted.

#### 1.52.10 Rest Rooms

- a. In every place wherein contract labour is required to halt at night in connection with the contract works and in which employment of contract is likely to continue for three months or more, the Contractor shall provide and maintain rest rooms or other suitable alternative accommodation within fifteen days of the coming in to force of the rules in the case of existing establishment, and within fifteen days of the employment of contract labour in new establishment.
- b. If the amenity referred to in sub rule is not provided by the Contractor within the period prescribed, the principal employer shall provide the same within a period of fifteen days of the expiry of the period laid down in the sub-rule.
- c. Separate rooms shall be provided for women employees.
- d. Effective and suitable provision shall be made in every room for securing and maintaining adequate ventilation for the circulation of fresh air and there shall also be provided and maintained sufficient and suitable natural or artificial lighting.
- e. The rest room or other suitable alternative accommodation shall be of such dimension so as to provide at least floor area of 1.1 sq.mt. for each person making use of rest room.
- f. The rest room or rooms or other suitable alternative accommodation shall be so constructed so as to afford adequate protection against heat, wind, rain and shall have smooth, hard and impervious surface.
- g. The rest room or other suitable alternative accommodation shall at a convenient distance from the establishment and shall have adequate supply of wholesome drinking water.

#### 1.52.11 Canteen Facilities

- a. In every establishment of contract work and where in work regarding the employment of contract labour is likely to continue for six months and where in contract labour numbering one hundred or more ordinarily employed, the adequate canteen facilities shall be provided by the contractor for the use of such contract labour within sixty days of the date of coming in to force of the rules in the case of existing establishment and within 30 days of the commencement of the employment of contract labour in the case of new establishment.
- b. Deleted.
- c. The canteen shall be maintained by the Contractor.

### **1.53 Observance of Laws, Local Regulations**

The Contractor shall conform to all laws of the land and regulations and bye- laws of any local authority and of any water or electricity supply companies with whose system the structure is proposed to be constructed. He shall before making any variations from the drawings or specifications that may be necessitated for so conforming, give to the Employer's Representative a written notice, specifying the variations proposed to be made and the reasons for the Contractor does not receive such instructions within seven days, he shall proceed with the work conforming to the provisions, regulations or bye laws in

question and any variation in the drawing or specifications so necessitated shall be dealt with under the clause 1.35. The Contractor shall give notices required by the said Acts, regulations or bye-laws and bear the required fees in connection therewith. He shall also ensure that no attachments are made against materials for works related to the Contracts. The Contractor shall protect and indemnify the Employer against all claims or liabilities arising from or based on the violation of such laws, ordinances regulations, bye-laws, decrees or attachments by him or by his employees. The contractor shall also notify Employer in case any other unforeseen permit / NOC required to carry out the work.

#### **1.54 Force Majeure**

1.54.1 Neither party shall be liable to the other for any loss or damage occasioned / caused by or arising out of act of God and in particular "Unprecedented floods", volcanic eruption, earthquake or other convulsion of nature and other acts, such as but not restricted to invasion, the act of foreign countries, hostilities or war like operations before or after declaration of war rebellion military or usurped power (but excluding strikes and lockouts) which prevent performance of the contract and which could not have been foreseen or avoided by a prudent person.

Note: "Unprecedented flood" means the flood crossing the highest observed flood level which is on the available record.

1.54.2 If any loss of damage happens to the works, or any part thereof, or materials or plant for incorporation therein, during the period for which the contractor is responsible for the care thereof, from any cause whatsoever, other than the risk defined in the clause 1.54.1 as above, the Contractor shall at his own cost, rectify such loss of damage so that the permanent works conform in every respect with the provisions of the contract to the satisfaction of the Engineer-in-Charge.

### **1.55 No Compensation for Delay in Availability of Land**

No Compensation shall be allowed for any delay caused in execution of the work on account of delay in making available the full site of land at a time.

### **1.56 Liquidated Damages**

- a. The time allowed as stipulated in the Tender for carrying out the work is 03 (Three) months and it shall be strictly observed by the Contractor and reckoned from the date on which the order to commence work is given to the Contractor. The work throughout the stipulated period of the contract shall be proceeded with all due diligence (time being deemed to be the essence of the contract on the part of the Contractor). To ensure good progress during the execution of the work, the Contractor shall be bound in all cases to complete the work as under:-
- b. In the event of the Contractor failing to comply with the condition, stipulated in para (a) above he shall be liable to pay as liquidated damage an amount equal to point one percent (0.1%) of the contract per day of delay up to the date of Completion subject to the maximum amount of Ten percent (10%) of Tendered Amount.
- c. Deleted.
- d. Failure in completion of work in stipulated time limit shall be sufficient cause for termination of Contract and forfeiture of security deposit.

### **1.57 No Compensation for Delay in the Execution of Work Due to Water Pools**

No compensation shall be allowed for any delay in execution of the work on account of water standing in borrow pits / borrow area, work site or compartment. The rates are inclusive of hard or cracked soil, excavation in mud, subsoil water or water standing in borrow-pits / borrow area and no claim for an extra rate shall be entertained unless otherwise expressly specified.

### **1.58 No Compensation for Change or Restriction of Works**

If at any time after the execution of the Contract documents, the Employer's Representative shall for any reason whatsoever, required the whole or part of the work as specified in the tender be stopped for any period or shall not require the whole or part of work to be carried by the contractor, he shall give notice in writing stating the fact to the contractor who shall there upon suspend or stop the work totally or partially as the case may be. In such case except provided hereunder the contractor shall have no claim to any payment or compensation whatsoever except as provided hereunder. on account of any profit or advantage which he might in consequence of the full amount of work not having been carried out on account of the any loss that he may put to on account of material purchased or agreed to be purchased or for unemployment of labour recruited by him. He also shall not have any claim for compensation by reason of any alternation having been made in the original specifications, drawings, designs and instructions which may involve any curtailment of the work as originally contemplated.

- a. During the period of suspension, the contractor shall not remove any plant or equipment from the site and any part of the work without prior written consent of the Employer's Representative.
- b. The contractor shall not be entitled for loss of expected profit from such work.

### **1.59 Claims**

The Contractor shall not be entitled to any claim/claims from the Employer on any account unless where allowed by the condition of this contract. In such cases, the Contractor shall have to submit a claim in writing to the Employer's Representative within one month on the cause of such claim occurring. All claims arising as a dispute of any kind out of the contract shall be governed by clause 1.60.

### **1.60 Arbitration**

If any dispute or difference of any kind whatsoever arises between the parties in connection with or arising out of or relating to or under this Contract, the parties shall promptly and in good faith negotiate with a view to its amicable resolution and settlement. In the event no amicable resolution or settlement is reached within a period of thirty (30) days from the date on which the above-mentioned dispute or difference arose, such dispute or difference shall be finally settled by arbitration. The arbitral tribunal shall consist of a sole arbitrator appointed by mutual agreement of the parties. In case of failure of the parties to mutually agree on the name of a sole arbitrator, the arbitral tribunal shall consist of three arbitrators. Each party shall appoint one arbitrator and the two arbitrators so appointed shall jointly appoint the third arbitrator. The seat of arbitration shall be Gandhinagar, Gujarat and the arbitration shall be conducted in the English language. The Arbitration and Conciliation Act, 1996 shall govern the arbitral proceedings. The award rendered by the arbitral tribunal shall be final and binding on the parties.

### **1.61 Rescinding of Contract in Case of Subletting Contract or Contractor Becomes Insolvent**

The entire contract shall not be assigned or sublet. The Employer may allow subletting the part or portion of the work not exceeding up to 40% (Forty percentages) of Tender cost, if the sub-contractor satisfies the requirement of the work to be sublet. If the Contractor shall assign or sublet his contract or attempt to do so or become insolvent or commence any proceedings to get himself be adjudicate and insolvent or make any compromise with his creditors, or attempt to do so, the Employer's Representative may by notice in writing, rescind the contract. Also if any bribe, gratuity, gift, loan, perquisite, reward or advantage, pecuniary or otherwise, shall either directly or indirectly be given, promised or offered by the Contractor or any of his servants or agents to any public officer or person in the employment of Employer in any way relating to his office or employment or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Employer's Representative may thereupon by notice in writing rescind the contract. In the event of contract being rescinded, the security deposit of the Contractor shall thereupon stand forfeited and be absolutely at the disposal of Employer and the same consequence shall ensue as if the Contract had been rescinded under clause 1.7 here of and in addition the Contractor shall not be entitled to recover or be paid for any work thereof actually performed under the contract.

## **1.62 Deleted**

## **1.63 Change in Constitution of Firm to be notified**

In the case of a Tender by firm partnership or limited company, any change in its constitution shall be forthwith notified by the Contractor to the Employer's Representative for his information.

## **1.64 Mobilization Advance**

- a. The Employer shall make an interest bearing advance payment @ Bank Rate + 5% per annum (the "Advance Payment"), equal in amount to 10 (ten) percent of the Contract Price, for mobilisation expenses and for acquisition of equipment. Here the Bank Rate means the Repo rate of interest announced by the Reserve Bank of India for all its lending operations on the Base Date that is 28 days before the Bid submission date. The Contractor may apply to the Employer for the Advance Payment at any time after the commencement date and signing of Contract Agreement, against an irrevocable and unconditional guarantee from a Scheduled Bank for an amount equivalent to 110% (one hundred and ten per cent) of such installment, substantially in the form provided, to remain effective till the complete and full repayment thereof.
- b. The advance payment shall be paid by the Employer to the Contractor within 15 (fifteen) days of the receipt of its respective requests.
- c. The recovery of all Advances shall commence when 20% of the original Contract Price of the work has been paid, and it will be completed by the time 80% of the original contract value has been paid or by the time of original Completion Date whichever is earlier.

## **1.65 Termination**

1.65.1 By the Employer: The Client may terminate this Contract, by not less than thirty (30) days' written notice of termination to the Contractor, to be given after the occurrence of any of the events specified in this clause:

- I. if the Contractor do not remedy a failure in the performance of their obligations under the Contract, within a period of thirty (30) days', after being notified or within such further period as the Client may have subsequently approved in writing;
- II. within thirty (30) days, if the Contractor become insolvent or bankrupt;
- III. if, as the result of Force Majeure, the Contractor are unable to perform a material portion of the Services for a period of not less than sixty (60) days;
- IV. within thirty (30) days, if the Contractor fails to comply with any final decision reached as a result of arbitration proceedings pursuant to relevant clauses hereof;
- V. within thirty (30) days, if the Contractor, in the judgment of the Client has engaged in Corrupt or Fraudulent Practices in competing for or in executing the Contract;
- VI. if the Employer, in its sole discretion and for any reason whatsoever, within a period of thirty (30) days' decides to terminate this Contract.

1.65.2 By the Contractor: The Contractor may terminate this Contract, by not less than thirty (30) day's' written notice to the Employer, such notice to be given after the occurrence of the

events specified in this clause:

- I. if the Employer fails to pay any money due to the Contractor pursuant to this Contract and not subject to dispute pursuant to relevant clauses hereof within forty-five (45) days after receiving written notice from the Contractor that such payment is overdue; or
- II. if, as the result of Force Majeure, the Contractor are unable to perform a material portion of the work for a period of not less than sixty (60) days.

1.65.3 Cessation of Rights and Obligations: Upon termination of this Contract pursuant to actual Termination, or upon expiration of this Contract pursuant to relevant clause hereof, all rights and obligations of the Parties hereunder shall cease, except (i) such rights and obligations as may have accrued on the date of termination or expiration, (ii) the obligation of confidentiality set forth in relevant clause hereof, (iii) the Contractor's obligation to permit inspection, copying and auditing of their accounts and records (iv) the rights of indemnity of the Client v) any right which a Party may have under the Applicable Law.

1.65.4 Cessation of Services: Upon termination of this Contract by notice of either Party to the other pursuant to relevant clauses hereof, the Contractor shall, immediately upon dispatch or receipt of such notice, take all necessary steps to bring the Services to a close in a prompt and orderly manner and shall make every reasonable effort to keep expenditures for this purpose to a minimum. With respect to the work done by the Contractor and equipment and materials furnished by the Client, the Contractor shall handover all project documents under procedure described in this contract.

1.65.5 Payment upon termination: Upon termination of this Contract, the Employer will make the following payments to the Contractor:

- I. Payment pursuant to satisfactorily performed work prior to the effective date of termination.

1.65.6 Disputes about Events of Termination: If either Party disputes Termination of the contract under relevant clauses hereof, such Party may, within forty-five (45) days after receipt of notice of termination from the other Party, refer the matter to arbitration under relevant clauses hereof, and this Contract shall not be terminated on account of such event except in accordance with the terms of any resulting arbitral award.

## Section 2. Appendices

### **Appendix A – Bill of Quantities**

- (i) Civil & Interior Finishes BOQ**
- (ii) Electrical, LV & Security System BOQ**
- (iii) AV System BOQ**
- (iv) HVAC System BOQ**
- (v) Plumbing & Firefighting System BOQ**

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
(i)	<b>Civil &amp; Interior Work BOQ</b>				
1	<b>CIVIL AND CIVIL FINISHING WORK: -</b> Demolition of brick work & stone masonry includes stacking of serviceable materials and disposal of unserviceable materials with all lead and lift. (III) In cement mortar.	20.00	Cu.M		
2	Dismantaling of existing floor tiled , wall tiles/ stone or stone floors or any other type of flooring laid in mortar including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift.Work complete including all type of job as suggested by EIC/Architect.	20.00	Sq.M		
3	Dismantaling of existing doors, windows, ventilators , any type of grill etc. (wood or steel) shutters including chowkhats, architraves, holdfasts and other attachment etc. complete and stacking the materials with all lead and lift. Not exceeding 3 Smt in area.	20.00	Sq.M		
5	Filling in plinth with sand under floors including watering, ramming, consolidating and dressing etc complete.	1.00	Cu.M		
6	R.C.C. M -25: Providing and laying controlled cement concrete M 25 and curing complete, including the cost of form work, vibrating and excluding cost of reinforcement for reinforced concrete work as per the detailed drawing , scaffolding etc complte as per instruction of Architect/EIC.	2.00	Cu.M		
7	Providing TMTFE 500 D bar reinforcement as per approved make and sample by Architect/EIC for R.C.C. work including bending, binding and placing in position, transportation, octroi, and other taxes etc complete for any level with scaffolding etc complete.	260.00	Kg.		
9	Providing 10mm.Thick cement plaster in single coat on brick/concrete wall for interior plastering upto any level finished even and smooth in [I]Cement mortar 1:3 (1 cement : 3 fine sand). Work complete including all type of scaffolding, tools, tackles etc complete.	2970.00	Sq.M		
10	Providing 15mm thick cement plaster in single coat on Rough (Similar) side of single or half brick walls/RCC for plastering any level and finished even in Cement mortar 1:4 (1-cement :4-sand) Work complete including all type of scaffolding , tools, tackles etc complete.	1900.00	Sq.M		
11	Pest Control treatment: Applying general insecticide pest control treatment to floors/building etc including labour material etc. complete. Using Heptachloride 20 EC. As Per 6113_pests Consentration Weight 0.50 percent is recommended one litre chemical emulsion dillute with 39 liter of water will give. Total dillute concentration will be 40 litre inclusive of one litre chemical emulsion appication 0.5 Litre chemical / Sq.M of surface is recommended as per I.S 5 years Agreement for warranty by including all type of job work complete as per suggestion of Architect/EIC.	3398.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
13	IPS : Providing and laying cement concrete flooring 1:2:4 (1-cement:2-coarse sand:4-graded stone aggregate 20mm nominal size) laid in one layer and finished with a floating coat of neat cement. (B) 50mm thick. (upto 10 ton)	3513.00	Sq.M		
14	Wash basin counter - Toilet Area (Counter width-600mm) : Providing & fixing two layers of wash basin counter, first layer using 25mm thick Kota stone of approved shade and second layer using approved shade and sample of Mirror finish Granite, joined together with 1:4 Cement mortar bedding / approved tile adhesive, to true plane & level or to slopes, or close jointed with cement slurry with pigment of matching shade and colour and finishing with the same, including dedo 1'6" ht, cutting kotah & tile as per required shape & size to fit Wash basin, & 3" to 9" fascia with moulding, No.ing, chamfered front edges, fixing, disposal of debris etc. finished as per design in detail drawing and instruction of Architect/EIC. Basic rate of Granite with finish is Rs.175 / Sqft. The sample mock shall be approved from Architect/EIC.	1.00	M		
15	Wooden Platform : Providing and fixing wooden platform area made by 25 mm thick structure PLY fixed on solid wooden structure & MS structure fabricating, assembling, hoisting / erecting and fixing in position at all heights/all levels/all floors/all shapes & sizes with all leads & lifts using MS Rolled Steel Sections, Hollow sections, Tubular Sections, MS Plates, Chequered Plates etc. all confirming to latest relevant IS codes for the MS work for platform work .For Level 100mm	2.21	Sq.M		
16	For Level 200mm	4.73	Sq.M		
17	For Level 300mm	7.48	Sq.M		
18	For Level 500mm	13.30	Sq.M		
19	For Level 700mm	19.22	Sq.M		
20	For Level 900mm	101.77	Sq.M		
21	For Level 1100mm	31.79	Sq.M		
22	For Level 1300mm	40.32	Sq.M		
23	For Level 1500mm	98.75	Sq.M		
24	Carpet Flooring Work: Providing & laying carpet flooring of as per approved make list and select Sample by Architect. Carpet fixed with SR 505 Pidilite or equivalent tile adhesive and rate shall be inclusive of 4 mm thick hitlon underlay foam material. Carpet should be laid as closure to No. other. Contractor will take care for level matching with other area flooring. Scope includes labour, under lay material, disposal of debris, necessary cutting of tiles without damaging the edges, and at require area provide 304 ss finish end profile to protect and cleaning, etc. complete. All works are carried as per detail drawing / instruction of architect /	360.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	EIC. before laying carpet contractor shall prepare even surface up to 20 mm).Basic rate of carpet is 4400/- Sq.Mt				
25	Wooden flooring at stage : Providing and fixing 13 mm thick wooden flooring as approved make list and sample by architect ,real wooden planks laying on base floor rate shall be inclusive of 4 mm th hitlon underlay foam materialand interlocked with approved make of tile adheshiv e , and 3 mm under lay material as per suggestion by manufacturers instruction . as per detailed drawing or instruction of architect. Work shall be carried under supervision of specialist, matching with surrounding levels etc. complete.Basic Rate for material only wooden plank is Rs.650/Sqft. Total job finished with where ever required end profile and skirting as per instructions of EIC.	95.00	Sq.M		
26	Wooden skirting: Providing and fixing 13 mm thick wooden skirting of as per approved make list and select sample by architect ,Work shall be carried under supervision of specialist, matching with surrounding levels etc. complete. Only the actual running length of skirting installed shall be measured in M. for payment. Rate shall be for all floors and at all heights including all costs. The rates are also inclusive of polishing and necessary scaffolding, tools, tackles etc.sample mock of 2 M minimum of the frame work and skirting) shall be got approved from Architecture & EIC. Item shall be operated, measured and paid if and only not mentioned in relevant tender item.Basic Rate for material only wooden skirting is 650/ Rft.	22.00	M		
27	Vitrified Flooring: Providing and laying vitrified floor tiles in 800X800mm sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement: 4 coarse sand), jointing with grey cement slurry @ 3.3 Kg./ Sq.M including grouting the joints with white cement and matching pigments etc., complete.	57.00	Sq.M		
28	Skirting: Providing and laying Vitrified tiles in 800X800mm sizes (thickness to be specified by manufacturer), with water absorption less than 0.08 % and conforming to I.S. 15622, of approved make, in all colours & shade, in skirting, riser of steps, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), jointing with grey cement slurry @ 3.3 Kg./ Sq.M including grouting the joint with white cement & matching pigments etc. complete.	49.00	M		
29	Toilet Flooring: Providing and laying vitrified floor tiles in 600X600mm sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing	4.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	with grey cement slurry @ 3.3 Kg./ Sq.M including grouting the joints with white cement and matching pigments etc., complete.				
30	Toilet Dado Work : Providing and laying Lapato/ Matt /Glossy/ Non skid./Rustic finish Vitrified tiles in dado using minimum 10 mm thick tiles approved by architect /client (size 600 mm X600mm) fixed in dado on 10 mm th. Cement plaster 1:3 (1 cement: 3 coarse sand) All surfaces must be dimensionally stable according to IS 1443-1972, level, cured, undamaged, compact,rigid,resistant, dry and free from any debonding agents tiles fixed by approved tile adhesive and all application shall be done under instruction of manufacturer guideline and specification , and jointed with 3mm thick epoxy grouting laticrete or equivalent approved make of approved shade and colour in proper line and level as per detailed drawing / instruction all complete as per approved sample by Architect, drawings and instruction of EIC. at all floors / all levels / all heights and all shapes . Basic rate of tile is Rs. 120/Sq.ft. (Make : Kajaria or Equivalent)	15.00	Sq.M		
31	Providing & laying approved quality granite of approved shade, thickness 18 mm(selected and sorted for its uniform colour and thickness)., in floor, otta, sill,tread , riser etc. in required sizes (not exceeding 2.1 m. x 0.75 m.) and shapes, set with cement slurry (minimum 4.4 Kg. cement/Sq.M) including 35mm to 70 mm thick (Average thickness 50 mm) cement mortar bedding (thickness of mortar bedding to be decided as per requirement and as directed by EIC or his representative) in 1:6 laid and jointed with white cement and matching pigment including rubbing, re-polishing after fixing to remove any undulation between the joints (if required) with different grades of Emery, refilling of open joints, curing, daily cleaning and mopping, shall be done up to the satisfaction of the EIC (Only finished work will be measured.) etc. all complete as per approved sample by Architect, drawings and instruction of EIC. at all floors / all levels / all heights and all shapes. The rate includes machine cut edges of uniform thickness and beveling and mirror polishing of edges. The rate shall be inclusive of protecting the flooring by plaster of Paris applying and after completion of work remove or 4 mm thick protection sheet of Supreme make EPE+HM Blue .Basic rate of Granite with finish is Rs.200 / Sqft.	1482.00	Sq.M		
32	Granite Skirting :Providing & laying approved quality granite of approved shade, thickness 18 mm(selected and sorted for its uniform colour and thickness) for skirting of approved quality (sample of granite stone shall be approved by architect) as per design in required sizes and shapes, set with white cement slurry (minimum 3.3 Kg. cement/Sq.M) average 10 mm thick cement mortar bedding of grey cement 1:1 (1 cement:1	400.00	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	fine sand) laid and jointed with white cement/chemical/jointing/crack-filling epoxy adhesivesAll surfaces must be dimensionally stable according to IS 1443-1972, level, cured, undamaged, compact,rigid,resistant, dry and free from any debonding agents stone fixed by approved stone adhesive and all application shall be done under instruction of manufacturer guideline and specification , and matching pigment including rubbing, mirror polishing with different grades of Emery, curing, etc. complete. The rate shall be including crack filling material of approved make and shade. (Work shall be carried out as per approved sample.) The rate shall be inclusive of protecting the flooring by plaster of Paris and plastic and/or bubble top sheets.Basic rate of Granite-200/Sqft.				
33	Providing and laying 20 mm thick Italian marble stone slab for Flooring, sill, etc. of approved quality (sample of marble stone shall be approved by architect) as per design in required sizes and shapes, set with white cement slurry (minimum 4.4 Kg. cement/Sq.M) 35mm to 70 mm (Average thickness 50 mm) thick cement mortar bedding (thickness of mortar bedding to be decided as per requirement and as directed by EIC or his representative) of grey cement 1:6 (1 cement: 6 coarse sand) laid and jointed with white cement/chemical/jointing/crack-filling epoxy adhesives and matching pigment including rubbing, mirror polishing with different grades of Emery, curing, etc. complete. The rate shall be including crack filling material of approved make and shade. (Work shall be carried out as per approved sample.) The rate shall be inclusive of protecting the flooring by plaster of Paris applying and after completion of work removing or 4 mm thick protection sheet of Supreme make EPE+HM Blue. Basic rate of Italian Marble stone is 700/ Sqft.	1406.00	Sq.M		
34	Providing and laying 20 mm thick Italian marble stone slab for skirting,riser & dedo of approved quality (sample of marble stone shall be approved by architect) as per design in required sizes and shapes, set with white cement slurry (minimum 3.3 Kg. cement/Sq.M) average 10 mm thick cement mortar bedding of grey cement 1:1 (1 cement:1 fine sand) laid and jointed with white cement/chemical/jointing/crack-filling epoxy adhesivesAll surfaces must be dimensionally stable according to IS 1443-1972, level, cured, undamaged, compact,rigid,resistant, dry and free from any debonding agents stone fixed by approved stone adhesive and all application shall be done under instruction of manufacturer guideline and specification , and matching pigment including rubbing, mirror polishing with different grades of Emery, curing, etc. complete. The rate shall be including crack filling material of approved make and shade. (Work shall be carried out as per approved sample.) The rate shall be	213.00	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	inclusive of protecting the flooring by plaster of Paris and plastic and/or bubble top sheets.Basic rate of Italian Marble stone is 700/ Sqft.				
35	Single Leaf Flush Door with frame and finish with veneer(40MM) : Providing and fixing in position 40mm thick solid core wooden single leaf flush doors of approved make having fire retardant ply facing on both sides and finished with veneer as approved , frame size - 100 X 50 MM , polishing work , Hardware system of Geze/Dorma like Hinges , Boxer type door closer , Door handle, Euro profile , lock , Door stop . Work complete including all type of hardware, fittings, fixtures etc complete as per detailed drawings and specifications. Basic Rate for material only teak veneer - 75 /Sqft. Sample mock shall be approved from Architect/EIC.	24.00	Sq.M		
36	Single Leaf Flush Door with glass view panel & WPC frame (50X150 mm): Providing and fixing in position 40mm thick solid core wooden single leaf flush doors of approved make having fire retardant ply facing on both sides and finished with 1.5 mm thick laminate as approved , 8 mm thick milky glass view panel, Hardware system of Geze/Dorma like ( Hinges , Boxer type door closer , Door handle , Euro profile , lock , Door stop ) . Work complete including all type of hardware, fittings , fixtures etc complete as per detailed drawings and specifications. Basic rate of 1.5 mm thick laminate is 45/Sqft. Sample mock shall be approved from Architect/EIC.	2.00	Sq.M		
37	Acoustic door : Providing & Fixing Acoustical Isolation door of wood frame of 145 mm x 75 mm (nominal) along with fire & smoke seal strip of size 12mm x 4mm for 120 minutes fire rated and Rw 35 db acoustic door of thickness 100 mm having 50 mm infill of 50 mm thick & 48 Kg./Cu.Mt density glasswool sandwiched by 2 No. of 12 mm Anutone or equivalent make Magnesia Oxide fire rated boards (edge to edge on internal hardwood frame) and cladded with 6 mm fire resistant ply with 3 mm rubber sheet interlayer and finished with both side 4 mm thick veneer and 45 x 5 mm thick polished teakwood pattis with 1.5 mm groove in between on the other. 25 mm teakwood frame will cover the entire door panel as shown in the drawing. The door shall be resistant to mould growth, abrasion, vermin, minor impact and short term exposure to water. The door shall have acoustic seal in door rebates and drop dead seal at the bottom. Additional teakwood frame shall be provided horizontally in the center for enforcement. The sound reducing doors shall be finish by teak veneer both side as per approved make and sample finish with semi gloss PU polish rected by the engineer / architect in charge and also include door closure, door coordinator, panic bar with outside key, handle, etc Hardware	32.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	system of Geze/Dorma like ( Hinges , Boxer type door closer , Door handle , Euro profile , lock ,Door stop ) . Basic rate of veneer is 75/Sqft.				
38	Heavy duty Alluminium frame Door with glass view panel: Providing Supplying and Fixing of Air tight Aluminum door frame size with overlapping flange and two sides Beerier with 6mm thick toughen glass. All Profile should have Euro groove facilities to accommodate All Imported hardware's like level, gizee etc. All locking should have multi point lock system to give Perfect air tighten profile should be suitable to accommodate good quality i.e. dorma, hafle etc.Door closer.All doors should have good quality cylindrical lock With 2 side Key, lock facilities. All joints should have appropriate Jigs & Clits to withstand all type of Loads. All profile weight should not be less then weight shown in tender.Door frame: - 1.5 Kg./M.Shutter style: - 2.3 Kg./M.Shutter bottom & top rail - 2.1 Kg./M.Work complete including all type of fittings, fixtures etc complete. Sample mock shall be approved from Architect/EIC.	6.00	Sq.M		
39	Wall Punning : Providing and applying Plasto XP Gypsum plaster ( USG Boral) or equivalent make , minimum 12 mm thick in Wall and minimum 6 mm thick in ceiling , including all labors, tools, tackles, scaffolding, surface preparation, mixing of material, transportation (lead & lift) applying in position, Levelling, finishing, cleaning etc. complete to satisfaction of EIC. The rate also include making of grooves above skirting, dado tiles and around window and door jambs etc. (cost of Bonding agent to the ceiling or RCC surfaces is to be included in the item).item shall be used as per instruction of Architect/EIC.	250.00	Sq.M		
40	Providing and Applying of required thickness Birla or Asian acrylic lapy ( putty) of approved brand and manufacture on wall surface to give an even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand papered smooth complete. item shall be used as per instruction of Architect/EIC.	250.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
41	<p>Interior painting : Wall painting two coats with low VOC Fenomastic Hygiene Silk of Jotun/Royal Aspira or equivalent approved brand in any shades and colour as directed on wall surface to give an even shade including applying two coats of Acrylic co-polymer Stucco putty of Jotun or equivalent on a one coat of PVA primer/Decoprime or equivalent and two coats of paint, scaffolding to at any height with all labour and material thoroughly brushing the surface free from mortar droppings and other foreign matter and sand prepared smooth etc. complete. Top coat should have. The substrate must be sound, clean, dry, free from dust, oil, grease and laitance etc. All traces of release agents must be removed. On chalky and dusty surfaces, all loose material must be removed by stiff bristle brushing. The primer / paint application is to be done with the rollers. Rate shall be including crack filling and levelling as per manufacturer's specification.</p> <p>1) Low VOC content. 2) Crack Bridging ability upto 1 mm. 3) Ability to resist bacteria/fungus 4) APEO (Alkyl Phenol Ethoxylate) and Formaldehyde free 5) Very Low Flame spread 6) Superior Washability. Note: System is 1 Coat of Primer+2 Coats of Putty+2 Coats of Finish Paints.</p>	5783.00	Sq.M		
42	<p>Texture paint ( Insider ) :Wall painting two coats with low VOC Jotashield Tex Ultra of Jotun or equivalent approved brand in any shades and colour as directed on wall surface to give an even shade including applying of a one coat of Penetrating primer or equivalent and two coats of paint, scaffolding to at any height with all labour and material thoroughly brushing the surface free from mortar droppings and other foreign matter and sand prepared smooth etc. complete. The substrate must be sound, clean, dry, free from dust, oil, grease and laitance etc. All traces of release agents must be removed. On chalky and dusty surfaces, all loose material must be removed by stiff bristle brushing. The primer / paint application is to be done with the rollers. Rate shall be including crack filling and levelling as per manufacturer's specification. Top coat should have.</p> <p>1) Low VOC content. 2) Crack Bridging ability upto 2.6 mm. 3) 100% pure acrylic emulsion 4) Anti-Carbonation concrete protection 5) Very Low Flame spread 6) Superior Washability.</p>	100.00	Sq.M		
43	<p>Semi glossy Enamel paint : painting two coats with low VOC Fenomastic Pure Colour Enamel Semi-Gloss (Alkyd Base) of Jotun/Satin of Asian Paints /Dulux Satin of AkzoNobel or equivalent approved brand in any shades and colour as directed on wall surface to give an even shade including applying one coat of Acrylic co-polymer Stucco putty of Jotun or equivalent (if applying on wooden surface) on a one coat of PVA</p>	100.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	prmer/Asian wood primer or equivalent and two coats of paint, scaffolding to at any height with all labour and material thoroughly brushing the surface free from mortar droppings and other foreign matter and sand prepared smooth etc. complete. The substrate must be sound, clean, dry, free from dust, oil, grease and laitance etc. All traces of release agents must be removed. On chalky and dusty surfaces, all loose material must be removed by stiff bristle brushing. The primer / paint application is to be done with the rollers. Rate shall be including crack filling and levelling as per manufacturer's specification. Top coat should have. 1) Low VOC/Lead/Mercury Free content. 2) Good Washability 3) Rich luxury semi-gloss finish 4) Anti-Yellowing poperties . Note : System is 1 Coat of Primer+1 Coat of Putty+2 Coats of Finish Paints				
44	Providing & applying natural oil and water finish (Telpani-double boiled linseed oil diluted with turpentine in required proportions ) polish in 3 or more coats to the wooden / Plywood / veneer surface, moldings etc. with the help of sand paper of 60, 80, 100, 120 No. etc including surface preparation, applying filler / hardener / putty, sanding, cleaning of furniture after completion of job etc. complete to the satisfaction & as directed by the EIC. (Mode of Measurements: Only the polished area shall be measured & paid for the items in which polishing is not inclusive in item description) work shall be carried out as per the manufacture's specification & approved sample.	250.00	Sq.M		
45	Providing and fixing anchor fastener system chemical based of Hilti or equivalent make for connections in concrete as per design and drawings and/or as directed by engineer in charge. (Rate shall include cost of bolts, labour, all material including chemical cartridge (wherever required). T & P for power drilling, cleaning the drilled holes of loose dust by blowing air, insertion of chemical from cartridge with plastic nozzles as may be required, placing internally threaded sleeve, driving of bolts, 2 No.-4 mm thick (hot dip galvanized coated) washer, fastening screw and tightening with nuts and check nuts etc may be required.Work complete including all type of tools, tackles, scaffolding etc complete at any level and height. Work complete as per the instruction of Architect/EIC. 12 mm dia.	10.00	No.		
46	16 mm dia	10.00	No.		
47	20 mm dia	10.00	No.		
48	25 mm dia	10.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
49	Fabricating, supply and erecting in position Standard Structural steel sections conforming to IS 2062 with (YST-310) for other works using Pipes, square/rectangle hollow sections etc. including welding, cutting, wastage, etc. complete. The rate is inclusive of welding road, supply & fixing of correct size nut, High strength bolts of 8.8 grade, washers, paint, with all contractor's materials, labour, tools & plants, in bolted / welded construction as directed by Engineer-in-Charge. Contractor will be supplied the GA drawings of structural steel as well as major connections. All fabrication drawings, internal connections & construction methodology shall be developed by contractor & has to get it approved through consultant / engineer in charge. Anticorrosive paint must be applied before applied any paint. The rate shall inclusive of providing and applying Epoxy Coating of approved shade, brand and manufacture on new structural steel work with one coat of 30 micron (DFT) of Epilux 4 Zinc Rich primer of Berger Paint India Ltd or equivalent as primer and Two coat No. of 35 micron (DFT) of Epilux 84 High Gloss CR enamel of Berger Paint India Ltd or equivalent at all levels. (Total DFT is 30+35+35=100 microns) The waste cut pieces shall not be included in the paying quantity. The work shall be done as per drawing and specification. The work shall be carried out as per IS: 800, IS: 816. Work complete including all type of tools, tackles, scaffolding etc complete at any level and height. Work complete as per the instruction of Architect / EIC.	915.00	Kg.		
50	Fabricating, supply and erecting in position Standard Structural steel sections conforming to IS 2062 with (YST-310) for railing or other works using Plate, flats etc. including welding, cutting, wastage, etc. complete. The rate is inclusive of welding road, supply & fixing of correct size nut, High strength bolts of 8.8 grade, washers, paint, with all contractor's materials, labour, tools & plants, in bolted / welded construction as directed by Engineer-in-Charge. Contractor will be supplied the GA drawings of structural steel as well as major connections. All fabrication drawings, internal connections & construction methodology shall be developed by contractor & has to get it approved through consultant / engineer in charge. Anticorrosive paint must be applied before applied any paint. The rate shall inclusive of providing and applying Epoxy Coating of approved shade, brand and manufacture on new structural steel work with one coat of 30 micron (DFT) of Epilux 4 Zinc Rich primer of Berger Paint India Ltd or equivalent as primer and Two coat No. of 35 micron (DFT) of Epilux 84 High Gloss CR enamel of Berger Paint India Ltd or equivalent at all levels. (Total DFT is 30+35+35=100 microns) The waste cut pieces shall not be included in the paying quantity. The work shall be done as per drawing and specification.	915.00	Kg.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	The work shall be carried out as per IS:800, IS:816 .Work complete including all type of tools , tackles, scaffolding etc complete at any level and height. work complete as per the instuction of Architect/EIC.				
51	INTERIOR FURNISHING WORK :- Frosted sparkling glass film : Providing and fixing 3M Scotchcal Frosted Crystal or equivalent approved Translucent, cast PVC, self-adhesive vinyl, special CRYSTAL-effect film to reproduce Sand-blasting effect on glass with customised designs. MCS warranty of 3 (if exposed to direct sunlight) to 10yrs (indoors) must be endorsed by manufacturer. Rate shall be inclusive plotter cutting design as per architect suggestion. Contractor shall provide shop drawing for approval of Architect.work complete incuding all type of tools, tackles, scaffolding etc complete as per suggestion of Architect/ EIC. If in case any application finishing will not as per satisfaction contractor shall remove all film at their cost. Contractor shall do a sample mock of 5 Sq.M minimum of glass film) ,shall be approved from EIC.	500.00	Sq.M		
52	Wooden Frame Glass window with frame covering: Providing and fixing wooden frame made from waterpproof ply finish with veneer and 10 mm thick toughen glass of approved make fixed on frame. Work complete including all type of tools, tackles etc as per suggestion of EIC, and detailed drawing .Rate shall be inclusive of glass finishing, polishing etc, consumable hardware, tools, tackles etc. Veneer basic rate 80/Sqft.	2.00	Sq.M		
53	Providing and Fixing in position 50mm thick glass wool in slab form of density 24 Kg./Cu.M of UP Twiga make or any other approved make behind wall paneling as shown in the drawings and manufacture's specification. The Installation shall be as per following steps: 1. Fix framework / Batten out backside of wall paneling to suit width of insulation slabs 2. Fix expanded metal galvanized chicken mesh or agro net before the insulation on battens as a key for rendering, fixing it into vertical batten with staples or flat head nails. 3. Insulation slabs shall be fixed snugly between battens without gaps. 4. Depending upon humidity a layer of pre 1.5 mm thick laminate Vapour barrier shall be used behind insulation. The joints of the vapour barrier shall be sealed with self adhesive Aluminum tape. 5. Before fixing the perforated wall paneling, the entire surface shall then be covered with black fiberglass tissue as a vapour barrier. The joints of the vapour barrier shall be sealed with self adhesive Aluminum tape. 6. Fixing shall be done on vertical batten with staples or flat head nails or adhesive solution	100.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	7. Final finish shall be done with perforated gyp-board,/woodwool board/acoustic board ( As per seperate item)				
54	Supplying Cement Fibre Elegant Tile 600x600x5mm/600x1200x5mm with square edge density 1050kg/m3 covered with absorbtive microfiber coating on the front side and Acoustics fibre on the back side, thus making it acoustically absorbtive, water resistance, fire resistant NRC upto 0.89 at 160 Hz tested as per ISO 354. The tiles are anti sag and are to be installed directly on FR Wooden Frame 600x600mm centre to centre. 50mm thick, 1000 GSM absorb wool tested as per Fire Retardant ASTM D 635-1991/Insulation and IS 15061-2002 for excellent results. (Ceilinh at 1st Level - plain Gypsum Ceiling)	374.00	Sq.M		
55	Plain gypsum board FRMR grade ceiling: Plain gypsum FRMR grade false ceiling Suspension (considering all levels with require all fabricataion work and fitting from RCC slab to false ceiling up to 150 to1200 mm & The rate shall be consider in Sq.M for all floors and at all heights, Offsets whether covelight or fixed gypsum board size up to 100 mm to 1200 mm in the false ceilings including all costs). Work complete as per the manufacturers specification of Saint Gobain - M/F Suspended Ceiling 1 hour fire rated.: Providing and fixing Suspended ceiling using Gypsum or equivalent of ULtra G. I. PeriM Channels of size 0.5mm thick having one flange of 20mm and another flange of 30mm and web 27mm along with periM of ceiling, screw fixed to brick wall / partitions with the help of nylon sleeves and screws, at min. 600 mm centers. Then suspending G. I. intermediate channel of size 45mm, 0.9mm thick with two flanges of 15mm No. from the soffit at 1220mm centers with ceiling angle of width 25mm x 10mm x 0.5mm thick fixed to soffit with 27mm x 37mm x 25mm x 1.6mm thk G. I. cleat and 45mm x 8mm dia. steel expansion fasteners. Ceiling section of 0.5mm thickness having knurled web of 51.5mm and two flanges of 26mm No. with lips of 10.5mm are then fixed to intermediate channel with the help of connecting clip and in direction perpendicular to the intermediate channel at 457mm centers. Double layer of 15mm Gyproc Fireline Gypsum Board outer layer and 15mm thk Gyproc FRMR Gypsum Board on inner layer (conforming to IS 2095 part 1 2011) is then screw fixed to ceiling section with 25mm & 50mm dry wall screwed at 230mm centers. Screw fixing is done mechanically either with screw driver or drilling machine with suitable attachment. Finally the boards are to be jointed and finished so as to have a flush look which includes filling and finishing the edges of the boards with jointing compound, Joint paper tape and two coats of Drywall top coat suitable for Gypsum	1253.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	Board. 30mm Thick Stone mineral wool of density 48 Kg./m3 is laid over the ceiling section. Peripheri and cut out should be sealed with appropriate fire sealant. Contractor has to submit the performance certification from the manufacturer. Cutouts For light fittings, grill diffusers shall be made. Necessary cutting / providing openings in the ceiling for AC fixtures, grills, electrical fittings, or other utility services, hatch openings etc. shall be provided by the Contractor and cost of making such modifications shall be included in the price. No separate charges for cutting / providing opening will be paid. Trap doors with necessary ply frame work to be provided as required at no extra cost. Joints between the two gypsum board, (Board placed staggered) gypsum board and wall will have suitable tape and finishes with plaster of paris so as to have crack free joints.				
56	Plain gypsum board ceiling with decorative design: Plain gypsum false ceiling Suspension (considering all levels with require all fabricataion work and fitting from RCC slab to false ceiling up to 150 to 1500 mm & The rate shall be consider in Sq.M for all floors and at all heights, Offsets whether covelight or fixed gypsum board size up to 100 mm to 1500 mm in the false ceilings including all costs) . Work complete as per the manufacturer's specification. Providing and fixing Suspended ceiling using Gypsum or equivalent of ULtra G. I. PeriM Channels of size 0.5mm thick having one flange of 20mm and another flange of 30mm and web 27mm along with periM of ceiling, screw fixed to brick wall / partitions with the help of nylon sleeves and screws, at min. 600 mm centers. Then suspending G. I. intermediate channel of size 45mm, 0.9mm thick with two flanges of 15mm No. from the soffit at 1220mm centers with ceiling angle of width 25mm x 10mm x 0.5mm thick fixed to soffit with 27mm x 37mm x 25mm x 1.6mm thk G. I. cleat and 45mm x 8mm dia. steel expansion fasteners. Ceiling section of 0.5mm thickness having knurled web of 51.5mm and two flanges of 26mm No. with lips of 10.5mm are then fixed to intermediate channel with the help of connecting clip and in direction perpendicular to the intermediate channel at 457mm centers. 15mm Gypsum Board is then screw fixed to ceiling section with 25mm & 50mm dry wall screwed at 230mm centers. Screw fixing is done mechanically either with screw driver or drilling machine with suitable attachment. Finally the boards are to be jointed and finished so as to have a flush look which includes filling and finishing the edges of the boards with jointing compound, Joint paper tape and two coats of Drywall top coat suitable for Gypsum Board. Contractor has to submit the performance certification from the manufacturer. Cutouts For light fittings, grill diffusers shall be made. Necessary cutting / providing openings in the ceiling for decorative design, AC	425.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	fixtures, grills, electrical fittings, or other utility services, hatch openings etc. shall be provided by the Contractor and cost of making such modifications shall be included in the price. No separate charges for cutting / providing opening will be paid. Trap doors with necessary ply frame work to be provided as required at no extra cost. No extra cost for achieving decorative design in gypsum board as given in architectural drawings including all necessary required fabrication work.				
57	Wooden ceiling finish with veneer: Providing and fixing IS 710 12 mm thick plywood false ceiling as per drawing & instruction of EIC & sample approved (complete with frame work). Finish with 4 mm th veneer gurjan base ply Semi glossy PU finish polish. Plywood shall be fixed with required fabrication work and ply frame work with all necessary accessories Rate shall include cost of making of all cutouts for light fixtures, gadgets, gizmo, pelmets, grooves, beads and also provide support/template where ever required The rate shall be in sq.mt for all floors and at all heights including all costs the shop drawing (or a sample mock of 5 Sq.M minimum of the frame work and ceiling) shall be approved from EIC. 5mm Groove shall be provided at the junction of the false ceiling & the wall. (Considering all levels with require all fabricataion work and fitting from RCC slab to false ceiling 100 to 1000 mm). Basic rate of veneer 150/-SQFT.	614.00	Sq.M		
58	OPEN GRID CELL 150MM X 150MM 'LAY-IN' ALUMINIUM CEILING WITH 15mm GRID "Providing and fixing in true horizontal level Open cell Aluminum lay-in ceiling tiles with border panels forming flush-tegular edge of size 600mmx600mmx38mm having Fire Performance CLASS 0/Class 1 (BS 476). The tile of 'Global white' color with cell size 150mm X 150mm shall be laid on white painted 15mm profile grid system comprising Main runners (3000mm), 1200mm and 600mm cross tees with 15mm white flanges and 38mm web height. The grid should be of make with 15mm wide T - section flanges color white having rotary stitching on all T sections i.e. the Main Runner with C3 coupling, 1200 mm & 600 mm Cross Tees with Hardened XL2 Clip having a web height of 38 mm and a load carrying capacity of 14 Kg.s/M. The T Sections have a Galvanizing of 90 grams per M2 with pull out strength of 100 Kg.s. Suspension system for grid to be of "INSTALLATION: To comprise main runner spaced at 1200mm centers securely fixed to the structural soffit by approved hangers at 1200mm maximum centre & not more than 150mm from spliced joints. The last hanger at the end of No. main runner should not be greater than 600mm from the adjacent wall. 1200mm long cross tees to be interlocked between main runners at 600mm centre to form 1200 x 600 mm module. Cut	1156.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	cross tees longer than 600mm require independent support. 600 x 600mm module to be formed by fitting 600mm long cross tees centrally between the 1200 mm crosses tees. PeriM trim to be wall angles, secured to walls at 450 mm maximum centers." accessories manufactured and supplied by Industries consisting of M6 Anchor Fasteners with Vertical Hangers made of Galvanized steel of size 26 x 26 x 25 x 1.2mm with a Galvanized Thickness of 80gsm, A pre Straightened Hanger wire of dia – 2.65 mm of 1.8 m length., thickness of 80gsm and a tensile strength of 344-413 MPa, along with Adjustable hook clips of 0.8mm thick, galvanized spring steel for 2.68 mm. The adjustable clip also consists of a 3.5 mm aquiline wire to be used with the main runner.				
59	Supplying Stretch Fabric System on G.I studs 2400mm X 50mm web, flanges 15 & 50mm fully knurled giving it high strength, hot dipped galvanized steel with 120GSM zinc coating specially designed for Acoustic vibration management and long life with a backing 50mm thick insulation. 'Aphony Fibrette' Wood Fibre 1mm width cement composites bond of 600x1200x20mm tile with NRC 1.00 to be mechanically fastened on the G.I Studs. Acoustical infill of absorbwool 10mm which is adhered to the acoustical panel on the front side. Then 12mm/20mm Vinyl tracks are screw fixed on to the 6mm Ply and Acoustics panels. Then the fabric is stretched over the Vinyl tracks. The installed system should provide NRC OF 1.00.Fabric colour as per Architect choice-Ref attached specifications for more details. To be installed on G.I studs 600x600mm centre to centre 2400mm X 50mm web thickness 0.5mm, flanges 15 & 50mm fully knurled giving it high strength, hot dipped galvanized steel with 120GSM zinc coating specially designed for Acoustic vibration management and long life with a backing of. 50mm thick,1000 GSM absorb wool tested as per Fire Retardant ASTMD 635-1991/Insulation and IS 15061-2002 for excellent results. (Wall Penaling - GF)	820.00	Sq.M		
60	Soft Board : Providing and fixing on wall 12mm thick approved quality soft board with cotton cloth/fabric of approved make and shade on 12mm thick IS 710 ply with 19mm x 25 mm thick Ghana teak wood beading all around including semi glossy PU polish, as approved sample and as directed by Architect. The work shall be measured & paid in Sq.M for all floors, all level and at all heights including all costs (basic rate of cotton cloth /fabric for 54" wide shall be Rs. 400.00 per M The rate shall be inclusive of lacquer polish to all the exposed wooden members. Only the clear elevation area of the cloth/fabric shall be measured and	50.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	paid.				
61	<p>PLY WALL PANELING FINISH WITH VENEER FINISH: Providing &amp; fixing 12mm thick IS 710 ply fixed on frame work. The framework shall be fixed as per drawing vertically &amp; @ 600 mm c/c vertical &amp; 1200 mm c/c horizontally. The frame work shall be made from Aluminium section make JINDAL/HINDALCO conforming to IS specification In paneling, (intermediate, periM ) &amp; ( at vertical or horizontal joint of ply &amp; at turning point ) shall be fixed to the wall/floor &amp; ceiling with Sheet metal screws/Nylon grip screws of Corro-shield /Fischer and shall be supported by filling required size wedges /washers/ MS wall connectors or packings of teak wood /MS washers to ensure right angles and plumb level. All ply/wooden frameworks shall be treated with anti-termite treatment &amp; hidden The framework shall be covered with approved make plywood(IS 710- 12 mm ply),adhesive ,tape, headless nails etc ,finished with Veneer ( veneer base 4 mm thick Gurjan ply) with semiglossy PU polish &amp; in pattern as shown in the drawing. Rate shall be inclusive of grooves etc complete as per drawing or as directed by EIC/ Architect. The rate shall be in Sq.mt of actual paneling work for all floors, at all heights, all shapes .Rate shall inclusive of all material ,labor scaffolding, tools, tackles, for all heights and for all levels, Rates shall also be inclusive of cost of making cut outs/ openings for electrical fixtures, tube lights /air-conditioners ,grills, diffusers etc &amp; providing additional sections for strengthening around the openings/cutouts, making grooves between wall &amp; board or as per drawing /instruction of EIC. And no extra payment shall be considered for additional sections provided. All curved surfaces, recesses, waffles shall be part of the paneling including openable shutter wherever required area and finish with the same material. Rate shall be inclusive of all item inclusive part of paneling Only the clear elevation area shall be measured and paid. basic rate of veneer teak veneer -150/ Sqft -</p>	175.00	Sq.M		
62	<p>Mirror Panelling: Providing &amp; fixing 12mm thick IS 710 ply fixed on frame work. The framework shall be fixed as per drawing vertically &amp; @ 600 mm c/c vertical &amp; 1200 mm c/c horizontally. The frame work shall be made from Aluminium section make JINDAL/HINDALCO conforming to IS specification In paneling, (intermediate, periM ) &amp; ( at vertical or horizontal joint of ply &amp; at turning point ) shall be fixed to the wall/floor &amp; ceiling with Sheet metal screws/Nylon grip screws of Corro-shield /Fischer and shall be supported by filling required size wedges /washers/ MS wall connectors or packings of teak wood /MS washers to ensure right angles and plumb level. All ply/wooden frameworks shall be treated with anti-termite treatment &amp; hidden The framework shall</p>	120.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	be covered with approved make plywood (IS 710- 12 mm ply), adhesive, tape, headless nails etc, finished with Mirror in pattern as shown in the drawing. Rate shall be inclusive grooves etc complete as per drawing or as directed by EIC/ Architect. The rate shall be in Sq.mt of actual paneling work for all floors, at all heights, all shapes .Rate shall inclusive of all material ,labor scaffolding, tools, tackles, for all heights and for all levels, Rates shall also be inclusive of cost of making cut outs/ openings for electrical fixtures, tube lights /air-conditioners ,grills, diffusers etc & providing additional sections for strengthening around the openings/cutouts, making grooves between wall & board or as per drawing /instruction of EIC. And no extra payment shall be considered for additional sections provided. All curved surfaces, recesses, waffles shall be part of the paneling including openable shutter wherever required area and finish with the same material. Rate shall be inclusive of all item inclusive part of paneling Only the clear elevation area shall be measured and paid. basic rate of Bronze Mirror -150/ Sqft -				
63	Mirror: Providing and fixing 6 mm thick mirror of Saint Gobain or other approved make shall be fixed with SS studs.	6.40	Sq.M		
64	Ply palmet work: Providing and fixing wooden pelmets of upto 150mm/200 mm x 150 to 300 mm L shape made of 19mm thick ply as per IS 710 and beading of 4mm thick and 25mm wide Ghana Teak wood for curtains/blinds/projection screen of openings. Rate to be inclusive of lipping, cutting, wastages, necessary fixtures, nails, adhesives, necessary scaffolding, fixing at all heights and for all floors as per drawing and approved sample etc finish with veneer semi gloss PU finish basic rate of veneer 150/-per sqft(Mode of Measurements: Only the palmet length shall be measured & paid for the items in which palmet work is not inclusive in item description)	350.00	M		
65	Providing and applying natural Melamine polish of approved make - matt /semi gloss/glossy finish for internal wooden & veneered surfaces including surface preparation, applying filler / hardener / putty, sanding, cleaning of furniture after completion of job etc to the satisfaction of architects / EIC. Work shall be carried out as per the manufacture's specification & approved sample. The final coat should be sprayed by gun with pressure as per requirement. (Exposed wooden surface at all floor) (Mode of Measurements: Only the polished area shall be measured & paid for the items in which polishing is not inclusive in item description)	50.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
66	Providing and applying natural UV stabilized natural Poly urethane polish clear matt finish/glossy finish/semi gloss finish polish of approved make for external/internal wooden & veneered surfaces including surface preparation, applying filler / hardener / putty, sanding, cleaning of furniture after completion of job etc. to the satisfaction of architects / EIC. Work shall be carried out as per the manufacture's specification & approved sample. Item shall be operated only for the items where rate is exclusive of PU polish.(Exposed wooden surface at all floor) (Mode of Measurements: Only the polished area shall be measured & paid for the items in which polishing is not inclusive in item description)	50.00	Sq.M		
67	Providing and applying Lacquer polish of approved make and finish on new wood and wood based surface to give an even surface, including cleaning the surface of all dirt, dust and sand papered smooth and including a coat of wood file after completion of job etc. to the satisfaction of architects / EIC. (Mode of measurements: Only the polished area shall be measured & paid for the items in which polishing is not inclusive in item description) work shall be carried out as per the manufacture's specification & sample approved..(Exposed wooden surface at all floor) (Mode of Measurements: Only the polished area shall be measured & paid for the items in which polishing is not inclusive in item description)	50.00	Sq.M		
68	Roller blind (roller blind decorative fabric should be made up of 25% to 50% polyester, 50% to 75% PVC), it should have specific low emissivity treatment and lead free with Greenguard certification. It should have 3% - 5% openness, including antimicrobial additive preferably Microban. The fabric should be 0.76mm - 0.99mm thick, mesh weight should be 16.40 - 16.70 (oz/yd2), Flame retardant, Jacquard weave with 10 years of warranty against any distortion in fabric due to any reason.UV blockage should be approx 95% Roller Blind tube is made of Aluminum with a diaM of 38mm Anodized, bottom rail is power coated & mechanism of plastic with chain and metal bracket, sturdy fixing arrangement as per direction of Engineer in Charge. Basic rate 4700/- Sq.Mt (Make Deck/Hunter Douglas/ D Décor or equivalent)	605.00	Sq.M		
69	Providing and fixing stainless steel ( Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge, (for payment purpose only weight of stainless steel members shall be considered	10.00	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	excluding fixing accessories such as nuts, bolts, fasteners etc.)				
70	<p>False hollow Flooring: Providing &amp; Fixing of False flooring of approved Make list flooring system Panel: Unitile® USF 800 Access Floor panel of size 600 x 600 mm or equivalent approved make shall be all steel welded construction with an enclosed bottom pan of 64 hemispherical cones and top plain sheet is fuse welded at 144 locations to form a panel of an overall thickness of 35 mm. The panel after cleaning, degreasing, phosphating by 11 tank process is coated with 40 - 60 micron epoxy coat and is heated to achieve maximum adhesion to the panel surface and corrosion resistance. The inner empty core of the panel is injected with a light weight, fire retardant, non combustible cementitious compound at high pressure to fill in all the crevices of the panel and ensures support of not less than 90% of the top surface area of the panel. with 600x600 cement filled tiles of 33 mm thickness with 1.5 mm thick laminate along with under structures , including all type of frame work, anchoring , tools, tackles, fittings , adhesive , finishing work complete as per the instruction of Architect/EIC. Sub Structure: Sub structure installed to support the panel shall be suitable to achieve a minimum finished floor height of 150 mm to a maximum of 600 mm from the existing floor level. Pedestal design shall confirm speedy assembly and removal for relocation and maintenance. The assembly shall provide easy adjustment of leveling and accurately align panels for a maximum <math>\pm 25</math> mm in the vertical direction. Pedestals shall support an axial load without permanent deflection and an ultimate load as laid out in System Performance requirement. STRINGERS :The stringer is hot dipped galvanized steel cold rolled construction specially designed with ribs embossed on 3 sides for strength, lateral stability, and for enhanced rolling loads performance and to support the panels on all 2 four sides for alignment. The stringer to have a counter sunk holes at both ends to accommodate bolting of M6 machine screws to the pedestal head assembly. The stringers shall be 21 x 32 x 0.8 x 570 mm length.</p>	30.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
71	ACOUSTIC OPERABLE PARTITION -Manual Operable Partition consisting of series of individual flat elements of 100 mm thick travelling along the ceiling track assembled to form a solid wall. The entire system must function as a solid wall and even when closed should reveal minimal screws, fixing or other similar solid metal parts. The sound insulation of the operable partition should be 50dB tested under third party reputed laboratory in accordance to EN 20140-3. The test certificate should show the make and model of the system. All inclusive with panelling over the panels of Veneer/Fabric finished with PU/Melamine polish as proved by Architect sample. (Dorma, Hafele or equivalent)	120.96	Sq.M		
72	Audi Chair with Auto Tip up seatStand – To be 200 x 75 x 6 mm. M.S.Flat welded to 38 x 38 x 2 mm, CRCA tube 22”, long further supported to 38 x 38 x 2 mm – 11”long CRCA tube. Tip – Up movement supported by 200 x 75 x 6 mm M.S.Flat with M.S. twin support 12 mm in Dia.Rear Back Panel - 2 Layer Back made with 12 mm High-Impact plywood surfaced with wood veneer and polish. Back Cushion: Coldmolded foam for years of service. Foam density: 55Kg./m3. Cushion Thickness: 110-130mm. Seat Pan – 19mm High-Impactplywood 440 x 490 x130mm, all bolts to be received by Dash nuts CNC milled threaded and nailed of size – 20 x 10mm. Seat Cushion:Contoured seat cushion with serpentine spring inside to provide superior comfort and support. Cold-molded foam allows for years ofservice. Foam density: 60Kg./m3. Cushion thickness: 120-140mm. Tip-up seat with combination of spring and damping provides forlifetime of quiet seat return.Arm rest -Hardwood Armrest. To be of size 425 x 25 x 55 / 70 mm depending on the etc of the chair.Writing Tablet (Optional): Aluminium anodized swivel type writing mechanism with plastic injection and grave for pen and cup.Seat Upholstery: Upholstery would be with High Quality Fabric specially treated with Abration resistant ASTM D4966-98 (2044) andwith Teflon coating for easy removal of stains.To be by hoist and crane system followed by degreasing / derusting/Activation followed by 7 Tank powder coating processApproved Brands: PEN Workers / Herman Miller/ Featherliteoccupant. Tablet arms shall be available as either left or right-handed made from light weight solid wood with semigloss pu finish shade matching with entire decorumEnd Panels - provide upholstered to match the chairs finish with fabric.Basic rate of fabric as 2500 rs/M.	219.00	No..		
73	SINGLE SEATER CHAIR: Providing & palcing chair as per refrance image /approved by architect Padding material shall be high resiliency polyurethane foam, The back shall be 3/4” thick. The seat shall be 1-1/2” thick.Seating fabric shall be approved by architect All	6.00	No..		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	upholstery shall be first quality without creases, stretch lines, or wrinkles. The frame shall be teaksolid wood. legs and handle as per design with engarving and embosing patern All wood shall be finished with semigloss pu finish The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, sample approved and as directed by the Architect/EIC. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools & tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. Rate shall inclusive of shop drawing, mock up sample, all materials, loading, unloading, all taxes, transportation, placing at all floors and for all leads, and all accessories as described in item description.As approval of architect. Basic rate of fabric 500/ M				
74	1 Seater sofa : 900mm (L) x 715 mm (B) x 950 mm (H) The seat shall 150 mm th 40 density & back shall be 32 density foam & finished in Approved fabric upholstery as per the drawing/image and instruction from Architect/EIC all external & internal exposed woodwork to be finished in PU semi gloss finish polish. .The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, sample approved and as directed by the Architect/EIC. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools & tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. Rate shall inclusive of shop drawing, mock up sample, all materials, loading, unloading, all taxes, transportation, placing at all floors and for all leads, and all accessories as described in item description.As approval of architect. Basic rate of fabric 800/ M	17.00	No.		
75	2Seater sofa : 1500mm (L) x 715 mm (B) x 800 mm (H) The seat shall 150 mm th 40 density & back shall be 32 density foam & finished in Approved fabric upholstery as per the drawing/image and instruction from Architect/EIC all external & internal exposed woodwork to be finished in PU matt finish polish. .The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, sample approved and as directed by the Architect and Engineer-in-charge. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools & tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be	4.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	entertained for this. Rate shall inclusive of shop drawing, mock up sample, all materials, loading, unloading, all taxes, transportation, placing at all floors and for all leads, and all accessories as described in item description.As approval of architect. Basic rate of fabric 1000/ M.				
76	3 Seater sofa : 2100 (L) x 800 mm (B) x 900 mm (H) made up of Solid teak wood with PU matt finished polish. The seat shall 150 mm th 40 density & back shall be 32 density foam & finished in Approved fabric upholstery as per the drawing/image and instruction from Architect/EIC all external & internal exposed woodwork to be finished in PU matt finish polish. .The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, sample approved and as directed by the Architect and Engineer-in-charge. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools & tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. Rate shall inclusive of shop drawing, mock up sample, all materials, loading, unloading, all taxes, transportation, placing at all floors and for all leads, and all accessories as described in item description.As approval of architect. Basic rate of fabric 1200/ M.	1.00	No.		
77	CENTER TABLE - 900MM (L) x 600MM (W) : Providing fixing complete as per drawing/Ref Image. center table 35 mm thick top made from IS 303 BWR grade ply with gurjan base ply veneer finish matt PU finish and vertical support from ss 304 grade , including all type of hardware, fittings, fixtures , tools , tackles , etc complete as per attached ref image and drawing. The work shall be done as per the specifications, sample approved and as directed by the Architect/EIC. Basic rate of gurjan base ply veneer is 75 /Sqft. Provding and fixing/placing custom made furniture as per detail drawing/ref.image.The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, mock up sample approved and as directed by the Architect/EIC. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools & tackles, approved make for all floors, all heights, all levels and all places within	4.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. The unit shall be manufactured in parts and these parts shall be assembled at site.				
78	<p>CONSOLE: Providing &amp; fixing Console complete as per drawing/Ref Image. Approx size : 2400 x 400 x 600 mm made from up of 19mm thick BWR grade ply &amp; teak wood &amp; finished of Veneer of approved make and shade and all edges finish with teak wood beading matching semigloss PU finish with veneer. Rate shall be inclusive of providing, fixing all necessary brass satin finish nickel plated/ S.S 304 grade (hardware from Hettich like Auto Hinges, Rod locks, Multipurpose lock, Rate shall be inclusive of internal shelves of 19mm thick IS 303 BWR ply and outer side veneer and inner side 1.5 mm thick laminate, with 4mm thick solid wooden beading on all around the shelve All external &amp; internal exposed woodwork to be finished in PU matt paint finish polish as per specified item's manufacturer's specifications..Rate shall inclusive of providing mock up sample for approval of architect. Antique kind handle shall be fixed as per aproved sample of architect. Basic rate of veneer is 75/Sqft. Provding and fixing/placing custom made furniture as per detail drawing/ref.image.The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, mock up sample approved and as directed by the Architect/EIC. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools &amp; tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. The unit shall be manufactured in parts and these parts shall be assembled at site.</p>	2.00	No.		
79	<p>CORNER TABLE - 450MM (L) x 450MM (W) - (General waiting) Providing fixing complete as per drawing/Ref Image. center table 35 mm thick top made from IS 303 grade ply with gurjan base ply veneer finish semi gloss PU finish and vertical support from ss 304 grade , including all type of hardware, fittings, fixtures , tools , tackles , etc complete as per attached ref image and drawing. The work shall be done as per the specifications, sample approved and as</p>	14.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	directed by the Architect/EIC. Basic rate of gurjan base ply veneer is 80 /Sqft.				
80	Wardrobe: Providing and fixing wardrobe as per drawing/Ref image 1050(L) x600(D) x 2100(H) made up of 19mm thick BWR grade ply & finished of Veneer of approved make and shade. Rate shall be inclusive of providing, fixing all necessary brass satin finish nickel plated/ S.S 304 grade (hardware from Hettich like Auto Hinges, handle, Rod locks, Multipurpose lock, Telescopic channel S.s pipe oval Hettich (047 615) with ss socket ), tower bolts, ball catches/Magnet, hydraulic hinges etc Rate shall be inclusive of internal shelves of 19mm thick IS 303 BWR ply and outer side veneer and inner side 1.5 mm thick laminate, with 4mm thick solid wooden beading on all around the shelve & 2 No. of drawer unit with both side 1.5 mm thick laminate finished complete as per the drawing. Shutter made made from SS finish olive or approved make frame and handle profile with 4 mm th toughened glass with opaque film All external & internal exposed woodwork to be finished in PU semi gloss paint finish polish as per specified item's manufacturer's specifications..Rate shall inclusive of providing mock up sample for approval of architect. Basic rate of Veneer is 150 /Sqft.	2.21	Sq.M		
81	Dressing Counter: Providing and fixing Dressing Counter as per drawing/Ref image 3500(L) x450(D) x 900(H) made up of 19mm thick BWR grade ply & finished of Veneer of approved make and shade. Rate shall be inclusive of providing, fixing all necessary brass satin finish nickel plated/ S.S 304 grade (hardware from Hettich like Auto Hinges, handle, Rod locks, Multipurpose lock, Telescopic channel S.s pipe oval Hettich (047 615) with ss socket ), tower bolts, ball catches/Magnet, hydraulic hinges etc Rate shall be inclusive of internal shelves of 19mm thick IS 303 BWR ply and outer side veneer and inner side 1.5 mm thick laminate, with 4mm thick solid wooden beading on all around the shelve & 2 No. of drawer unit with both side 1.5 mm thick laminate finished complete as per the drawing. Shutter made made from SS finish olive or approved make frame and handle profile with 4 mm th toughened glass with opaque film All external & internal exposed woodwork to be finished in PU semi gloss paint finish polish as per specified item's manufacturer's specifications..Rate shall inclusive of providing mock up sample for approval of architect. Basic rate of Veneer is 150 /Sqft.	14.70	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
82	<p>Magazine Rack : Providing and fixing Magazine rack as per drawing and ref image made from IS 303 BWR ply with veneer matt PU polish including all type of hardware , fittings , fixtures, as per detailed drawing and instruction of Architect/EIC.Basic rate of veneer - 80/Sq ft.</p> <p>Providing and fixing/placing custom made furniture as per detail drawing/ref.image.The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, mock up sample approved and as directed by the Architect/EIC. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools &amp; tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. The unit shall be manufactured in parts and these parts shall be assembled at site.</p>	5.00	No.		
83	<p>TV UNIT / Projector Screen drawer unit : 3000(L)x400(D) Providing &amp; fixing projector drawer unit as per detail shape &amp; size with require accessoriesBasic rate of veneer is 150/Sqft.</p> <p>Top 35 MM th made from 12 mm th IS 303BWR ply &amp; veneer finish with matt PU finish Storage body is made of 19mm 303 BWR ply with veneer finish and inner side 1.5 mm thick laminate finish including require No. of drawer with all type of fittings ,cutout for air circulation ,require fixtures, hardware Hettich/Haffle make etc complete .SS 304 grade conceal handle shall be provide as per approved selection &amp;detailed drawing and instruction of Architect/EIC.Rate shall incusive require fabrication work considering load capacity of AV equipment.The work shall be done as per the approved specifications, sample approved and as directed by the Architect/EIC. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools &amp; tackles, adhesives consumable hardware &amp; required SS 304 grade hardware/accessories of approved make.</p> <p>Providing and fixing/placing custom made furniture as per detail drawing/ref.image.The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, mock up sample approved and as directed by the Architect /EIC. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools &amp; tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. The unit shall be manufactured in parts and these parts shall be assembled at site.</p>	3.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
84	<p>SCREEN MDF LASER CUTTING WITH SOLID WOODEN FARME WORK : Providing and making and fixing as per detail drawing and reference image screen made fro 35x 50 mm solid teak wood frame with 18 mm th exterior grade MDF sheet as per suggested pattern CNC cutting work complete. All expose wooden surfaces finish with matt PU finish The work shall be done as per the specifications, sample approved and as directed by the Architect/EIC. The rate shall be for complete item inclusive of all material, labor, wastages, necessary tools &amp; tackles, adhesives, consumable hardware &amp; required SS 304 grade hardware/accessories of approved make. Provding and fixing/placing custom made furniture as per detail drawing/ref.image.The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, mock up sample approved and as directed by the Architect/EIC. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools &amp; tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. The unit shall be manufactured in parts and these parts shall be assembled at site.</p>	25.00	Sq.M		
85	<p>Decorative Handle (pair): Providing &amp; fixing CNC cutting and design on MDF/veneer fxd on ply with necessary accessories etc with complete on glass/flush door finish with veneer. The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, sample approved and as directed by the Architect/EIC.Basic rate of gurjan base ply veneer is 75 /Sqft. (Second floor)                      Provding and fixing/placing custom made furniture as per detail drawing/ref.image.The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, mock up sample approved and as directed by the Architect/EIC. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools &amp; tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. The unit shall be manufactured in parts and these parts shall be assembled at site.</p>	19.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
86	<p>Banquet Hall / Conference Room Table - 3000 mm (L) x 1500 mm (W) - Providing and fixing Banquet Room / Conference Room Table with 35 mm thick top made from corian / quartz/neolith with IS 303 BWR ply structure and vertical support from teak wood with PU matt polish, including all type of hardware, fittings, fixtures, tools, tackes etc complete as per attached ref image and drawing. The work shall be done as per the specifications, sample approved and as directed by the Architect and Engineer-in-charge. Basic rate of 12 mm thick corian is 800 rs/sq ft and basic rate of veneer is 150 rs/sq ft.</p> <p>Providing and fixing/placing custom made furniture as per detail drawing/ref.image.The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, mock up sample approved and as directed by the Architect and Engineer-in-charge. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools &amp; tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill architect's design intent. No additional claims will be entertained for this. The unit shall be manufactured in parts and these parts shall be assembled at site.</p>	12.00	No.		
87	<p>Banquet Hall / Conference Room Table - 1500 mm (L) x 1500 mm (W) - Providing and fixing Banquet Room / Conference Room Table with 35 mm thick top made from corian / quartz/neolith with IS 303 BWR ply structure and vertical support from teak wood with PU matt polish, including all type of hardware, fittings, fixtures, tools, tackes etc complete as per attached ref image and drawing. The work shall be done as per the specifications, sample approved and as directed by the Architect and Engineer-in-charge. Basic rate of 12 mm thick corian is 800 rs/sq ft and basic rate of veneer is 150 rs/sq ft.</p> <p>Providing and fixing/placing custom made furniture as per detail drawing /ref.image.The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, mock up sample approved and as directed by the Architect and Engineer-in-charge. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools &amp; tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill architect's design intent. No additional claims will be entertained for this. The unit shall be manufactured in parts and these parts shall be assembled at site.</p>	12.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
88	Banquet Chair / Conference Room Chair: Providing & palcing chair as per refrance image /approved by architect Padding material shall be high resiliency polyurethane foam, The back shall be 3/4” thick. The seat shall be 1-1/2” thick.Seating fabric shall be approved by architect All upholstery shall be first quality without creases, stretch lines, or wrinkles. The frame shall be teaksolid wood. All wood shall be finished with semigloss pu finish The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, sample approved and as directed by the Architect and Engineer-in-charge. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools & tackles, approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. Rate shall inclusive of shop drawing, mock up sample, all materials, loading, unloading, all taxes, transportation, placing at all floors and for all leads, and all accessories as described in item description. As approval of architect. Basic rate of fabric 1500/ M.	240.00	No.		
89	Chair (AV Room): - Features: Low Back with Upholstered Seat & Mesh Back, Adjustable Armrest, gas lift for height adjustment & nylon base.Supplying and placing low Back Revolving Chair with Seat made out of PU moulded foam upholstery in Fabric. The back is breathable Mesh (for breathing of back) provides elastic support, yet allowing ventilation for airy comfort. Lumber Support fits comfortably to the curve of your back to provide additional support for your lower back (fixed with the back for Long hours comfort). Foam Density 50+ 5 mm. FULL BACK SIZE: 560 mm (ht). Back Height (Total Chair) = (415- 510 ) + 560 & Width 670 - 720 mm. Armrest : PP armrest with adjustable for height . Armrest parts of moulded polypropylene & steel stamping, in black finish. Mechanism: Synchro tilt mechanism with single angle locking facility Height Adjustment: Hight Ajustment upto 75mm Base: 700mm Studio base allows extra clearance for your feet movement. This standard base is moulded of polypropylene in black color & twin wheel castors. Model Similar to the picture attachedRate shall be inclusive of all materials, loading, unloading, all taxes, transportation, placing at all floors and for all leads, polishing and all accessories as described in item description.As approval of architect.(Make :Godrej Model : Bravo Mid Back Chair or Equivalent )	19.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
90	PROVIDING AND PLACING 52.4MM THICK 1200 MM HIGH PANELS IN WISH SYSTEM. WITH COMBINATION OF METAL RACEWAY AT BOTTOM, TOP TILE - FABRIC TACKABLE, WHITE BOARD, FABRIC MAGNETIC. PROVIDING POWDER COATED LEGS. RECTA WORKSURFACE 900 X 600 MM. NOVA FREE STANDING 3 DR PEDESTAL WITH FLAT METAL FRONT, CENTRAL LOCKING. WITH CPU TROLLEY and KEYBOARD TRAY (Make :Godrej or Equivalent )	11.00	No.		
91	Echo Storage: 1219H x 1800 W x 450D. Body: Body is made from 18mm PLB with all the edges sealed with 0.8 mm thick PVC Edgeband. The Back panel is 9mm White PLT. The entire construction is ready to assemble unit and is assembled with suitable KD fittings. The shelves and separator panels (if available) is made from 18 mm white PLT and edges are sealed with 0.8 mm edge band. The bottom shelf is fixed and other shelves have one step adjustment for optimizing the space. Doors: Door Panels ae made from 18 mm PLB with 2 mm Edge band on all edges ad a flush Plastic handle is fitted vertically at the center of the door. The hinge door has suitable hinges and HDU is fitted with an adjustable fitting for height adjustment. The SDU runs in a PVC track mounted on the TOP and Bottom panel of the Body. (Make :Godrej or Equivalent )	2.00	No.		
92	DIAS Lecture Stand - 635 (L) x 431 (W) x 1150 (H) : Providing and fixing as per detail shape and size table unit consist table with all required necessary accessories with IS 303 BWR ply structure and vertical support from teak wood with PU matt polish, including all type of hardware, fittings, fixtures, tools, tacks etc complete as per attached ref image and drawing. The work shall be done as per the specifications, sample approved and as directed by the Architect and Engineer-in-charge. Basic rate of veneer is 150 rs/sq ft. Provding and fixing/placing custom made furniture as per detail drawing/ref.image.The work shall be done as per the approved shop drawing (to be prepared by contractor), specifications, mock up sample approved and as directed by the Architect and Engineer-in-charge. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools & tackles,approved make for all floors, all heights, all levels and all places within campus. Contractor shall do all the needful and shall fulfill Architect's design intent. No additional claims will be entertained for this. The unit shall be manufactured in parts and these parts shall be assembled at site.	2.00	No.		
93	Glass Partition : Providing and fixing in position Full height 12mm thick toughened glass partition using Saint Gobain or equivalent glass to false ceiling height ply boxing to hold glass at top & Aluminum C-	5.33	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	channel of size 19mm x 19mm x 2.5mm at bottom side of approved make as per architect's instruction and as per detail drawing. Fixed panels of 12mm thick customized clear toughened glass, edge polished fixing with necessary cutting of glass as per drawing & specifications including providing and fixing EPDM quality rubber for aluminum sections / filling transparent neutral cure glazed & metal silicon sealant of approved make on the periphery of the glass & wood etc.No. glass panel secured to the ply box at top and C -Channel at floor.Item includes all necessary fitting / fixing etc. complete as per drawing, approval and instructions of the Architect. NOTE: Partition ht will be measured from finish floor to false ceiling level only. The rate shall be in sq.mt for all floors and at all heights including all costs. The rates are also inclusive of necessary scaffolding, tools, tackles, scaffolding etc complete. Glass width size shall be as per suggestion by EIC/Architect.				
94	Single Leaf Glass Door corner hinge system with pivot door : Providing and fixing in position full height 12 mm thick toughened glass door with all necessary Geze , Dorma hardware accessories as per approved selection by Architect. 12mm thick Saint Gobain make customized clear toughened glass, edge polished prepared with stainless steel patch fittings with locking arrangement / fixing No. glass panel secured to the floor by stainless steel patch fitting item includes all necessary fitting / fixing, fixtures- like Geze / Dorma Hardware system like ( Corner hinges with pivot, Glasklar Lock, Door Handle, Keys ,round shape lock with alluminium cover , Door Stop ) complete as per specification drawing approval and instructions of the Architect. Rate shall be inclusive of all material loading unloading at all height and all floor. sample mock shall be approved from EIC/Architect.	2.10	Sq.M		
95	<b>Direct Bought Out Item :-</b> HEAVY TRAFFICE AREA DOOR MAT (TYPE-1 -WIPING TECHNOLOGY ): 3M Nomad - Wiping technology - Heavy Duty 7150 - or equivalent approved make Grey Colour:Open Construction Loop Matting with Crush Resilient Vinyl with backing. Matting Should be durable shouldn't Flatten over time. Thickness Should be 13mm Min.Suitable for heavy traffic areas, where traffic is upto 4 lakh people per year. work complete as per approved sample.	80.00	Sq.M		
96	TOILET MAT :Removal of moisture and fine sand with absorption technology. Loop piled featuring tufted construction with two different synthetic fibres mat size 450mmX600mm. basic rate 500/-	4.00	Sq.M		
97	(TYPE-3 ABSORPTION) : Providing and placing in position Removal of moisture and fine sand with absorption technology. Loop piled featuring tufted construction with two different synthetic fibres namely polypropylene and nylon combined to maximize dirt	10.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	removal,water pickup and holding capacity. Suitable for traffic of upto 4 lakh people per year.				
98	Providing and placing in position HAND KNOTED carpets made from 100% Newzealand wool/Viscoes ,100 knots aprox pile height 10 mm as required and approved by the Architect. Basic rate of Carpet = Rs.1180 /sqft	15.00	Sq.M		
99	Providing & placing in position DIGITAL CLOCK - WALL MOUNTED as per architect selection Ajanta Digital Wall Clock(Brown, Black, With Glass)Basic rate of Clock 1599/-	11.00	No.		
100	Providing and placing in position SS brush finish (5 LTS PEDAL BIN/ STEP BIN -) of karma Stainless Steel Dustbin(Silver) or Equivalent as per images and as selected by the Architect. BASIC RATE-700/-	24.00	No.		
101	VASE made of Stainless steel / Ceramic with artificial plant as per sample approved by architect and as per basic rate of Rs.2500 /-Pcs	20.00	No.		
102	Wall Painting (Canvas painting ): Providing & fixing painting made from canvas painting Canvas –suitable for oil and acrylic paints. The 100% cotton plain-woven canvas 1.5 mm thick laminatewith UV protection, abrasion & chemical resistance.with require stretching and/or framing.work approved by Architect.The art work shall be hanged on the wall using heavy duty approved key-hole chaplas The concept of the painting work will be sugeested by architect and interior designer and based on that offers from the artists to be invited for design and execution of the painting. The selection of the artist is to be done by architect and interior designer only. Main contractor is bind to follow the methodology suggested by architect and interior designer to be followed for development of commissioned art work.Rate are inclusive of artist appointing by main contractor.Basic Rate Per Sq.Mt 60000/- ( Paintings Generic)	25.00	Sq.M		
103	ART WORK : Providing and fixing in position commissioned art works inside the building on the wall or ceiling and extension of the same till floor/ceiling. The composition of the commissioned art work shall be from any type of wood, metal like copper, brass, SS, MS, fabric, polycarbonate sheets, acrylics, rubber, plastic, tough boards, cementatious boards, fibers, gypsum, POP etc. all.The commissioned art work may require any shade, finish and texture of duco painting, specialty painting, PU painting, general painting to paintable surfaces, galvanizing, powder coating, anodizing etc. The rate shall be inclusive of any type of lighting features to be added into it includes LED lights, neon lights including its supporting and suitable wiring for the same within the art works. Only one electrical control point connection will be given as	20.00	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	close to art works. The rate shall be inclusive of making necessary provisions within the commissioned art works of fixing of the same. The provisions of the fixing of the art work may be in parts but it shall be inclusive of the all arrangements like LN key, studs, anchors, nuts and bolts etc. all.. The concept of the art work will be generated by architect and interior designer and based on that offers from the artists to be invited for design and execution of the artwork. The selection of the artist is to be done by architect and interior designer only. Main contractor is bind to follow the methodology suggested by architect and interior designer to be followed for development of commissioned art work. The overall outline area covered by art work is to be considered for the measurement instead of actual area of art work. Deductions of the internal cutouts, spaces in between of the art work shall not be made. For any additional materials, process, methodology no extra payments shall be made. Total payment of the artwork will be done as per basic rate and difference between actual cost per Sq.M and basic rate per Sq.M will added or deducted without any consideration of the taxes, overhead and profit over the difference. It is the responsibility of the main contractor to provide scaffolding, power, water, facilitating the areas required for developments and storage of the art work etc. The protection and cleaning of the pre and post installation of the art work is the responsibility of the main contractor. Basic Rate 132000/Sq.Mt ( Custom Art Work )				
104	DIGITAL 2D/3D WALL PAPER : Providing & fixing 2d/3d digital printing printing on approved paper/canvas/fabric media as per suggested graphic work on suggested surface .Contractor shall provide graphic work detail & 5 Sq.Mm sample for approval the work shall be done inclusive of all rate with accesories,tool tacket at allheight compelte. Basic Rate 2300 /Sq.Mt	115.00	Sq.M		
105	Signages : Providing and fixing of the following signages using make of cosign or equivalent approved make by architect.All the detailed work out as per the detailed drawing and instruction of Architect/EIC.,specifications and drawings as indicated there in to all heights and elevation including necessary scaffoldings / supports /permanant fixing with cement mortar if fixed to ground etc complete in all respects.The Signage cost should be inclusive of panels,hanging system,bridges,primary & secondary fixings,vinyl,painting,powder coating self glowing mateial as directed etc.All shop drawings and coordination with other services is in scopeof contractor.( At all floor) Size (150 x 600mm) - FACE /WALL MOUNTED NAME PLATES/SIGNAGES/INFORMATION SIGNAGES	46.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	(with back lit)				
106	S.S FINISH POT:Providing & placing planter Pot made form SS suggested sizes & shapes & shade approved by architect with artificial plant as per selection by architect with artificial plant.Rate shall inclusive of sample, all materials, loading, unloading, all taxes, transportation, placing at all floors and for all leads,all accessories as described in item description.As approval of architect. (Plants 600mm Height - Pot 230mm dia x 300mm Height)	40.00	No.		
107	Plants 42 to 52" Height - Pot 7" dia x 1' 6" Height	30.00	No.		
108	Artificial pebbles & stone : Providing & placing pebbels as per Architect selection by various sizes & various colors,various finishes.	100.00	Kg.		
(ii)	<b>Plumbing &amp; Fire fighting BOQ</b>				
109	<b>PLUMBING &amp; FIRE FIGHTING SOIL, WASTE ,VENT ,RAIN WATER PIPES &amp; FITTINGS Providing and fixing soil waste and vent pipes. (a)100mm diaM centrifugally cast (spun) iron S&amp;S pipe as per IS:3989</b>	10	M		
110	Providing and fixing plain bend of required degree. a) 100 mm dia i) Centrifugally cast (spun) iron as per IS - 3989	2	No.		
111	Providing and fixing single equal plain junction of required degree. 100 x 100 x 100mm centrifugally cast (spun) iron S&S as per IS:3989	2	No.		
112	Providing lead caulked joints to sand cast iron/centrifugally cast (spun) iron pipes and fittings of diaM 100mm	19	No.		
113	Providing and fixing cast iron trap of self cleansing design with sand cast iron screwed down or hinged grating with or without vent, arm complete, including cost of cutting and making good the walls and floors 100mm inlet and 100mm outlet centrifugally cast (sun) iron S&S as per IS:3989	1	No.		
114	Painting sand cast iron/centrifugally cast (spun) iron soil, waste vent pipes and fittings with paint of any colour such as chocolate, grey or buff, etc., over a coat of primer (of approved quality) for new work. 100mm diametre pipe	10	M		
115	Providing and fixing GI pipes complete with GI fittings and clamps, including cutting and making good the walls, etc. (internal work).	5	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	32mm nominal bore				
116	Painting G.I. Pipes with two coats of anti-corrosive bitumastic paint of approved quality. 32mm dia	5	M		
117	Providing and fixing CP Brass floor cleanout plug as per drawing complete with G.I. Socket jointed to drainage pipe outlet with lead caulked joint. 100mm	1	No.		
118	<b>WATER SUPPLY SYSTEM</b> Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings including fixing the pipe with clamps at 1.0 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Concealed work including cutting chases and making good the walls etc. 15 mm nominal outer dia pipes	5	M		
119	20 mm nominal outer dia pipes	5	M		
120	Providing and fixing brass stop cock of approved quality : 22 mm nominal bore.	1	No.		
121	<b>SANITARY FIXTURES</b> Providing and fixing white vitreous china extended wall mounting water closet of size 780x370x690 mm of approved shape including providing & fixing white vitreous china cistern with dual flush fitting, of flushing capacity 3 litre/ 6 litre (adjustable to 4 litre/ 8 litres), including seat cover, and cistern fittings, nuts, bolts and gasket etc complete.	1	No.		
122	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require: White Vitreous China Wash basin size 550x400 mm with a pair of 15 mm C.P. brass pillar taps	1	No.		
123	Providing & fixing 15 mm nominal bore CP brass bib cock of approved quality conforming to IS 8931.	1	No.		
124	Providing & fixing 15 mm nominal bore C.P brass angle valve for basin mixer and geyser points of approved quality conforming to IS 8931.	2	No.		
125	Providing and fixing 600x450 mm bevelled edge mirror of superior glass (of approved quality) complete with ply or asbesters backing fixed to wooden cleats with C.P. brass screws and washers complete.	1	No.		
126	Providing and fixing CP Brass 32mm size Bottle Trap of approved quality & make and as per the direction of Engineerin-charge.	1	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
127	Providing and fixing <b>Soap Dispenser</b> With Metallic Bottle with all complete as per direction of Engineer - in - Charge. ( <b>JAQUAR Cat. No. -ACN-CHR-1137N</b> )	1	No.		
128	Providing and fixing C.P. brass towel ring ( <b>Jaquar Cat. No. ACN-1121N</b> ) or approved equivalent complete with C.P. brass brackets fixed to rawl plug of approved design with C.P. brass screws.	1	No.		
129	Providing and fixing C.P. brass robe hooks, ( <b>JAQUAR Cat. No. ACN-1161N</b> ) or approved equivalent.	1	No.		
130	Providing and fixing stainless steel toilet paper holder or approved equivalent ( <b>JAQUAR Cat. No. ACN-1151N</b> ) fixed in position by means of C.P. screws and rawl plugs embedded in the walls complete including cutting and making good the walls wherever required.	1	No.		
131	Providing and Fixing health faucet JAQUAR Cat. No. ALD-573 (ALLIED SERIES) with flexible pipe and wall hook with No. European W.C. Pan.	1	No.		
132	Providing and fixing S.S. hinged grating, 6mm thick with frame (NEER Cat. No. NRG-7008 approved equivalent) including setting in floor with cement mortar 1:3.	1	No.		
133	<b>HYDRANTS, PIPING &amp; ACCESSORIES</b> Providing & fixing dial type (100 mm) pressure gauge with isolation ball valve suitable for working pressure of 250 PSI. Cost shall be inclusive of providing any short pieces, nipples, elbows etc as required.	5	No.		
134	Providing, laying, jointing, testing and commissioning of following sizes of pipes conforming to IS-1239(up to 150mm dia) / IS-3589 (200mm dia and above) with all accessories like all fittings (standard MS fitting with welded joint shall be used on the pipes) including tees, elbows, reducers, union, flanges, rubber gaskets, GI nuts bolts, washer including supporting/fixing the pipe on floor / wall / ceiling with clamps, hangers (using anchor fastners) as per specification. PVC pipe sleeve of suitable higher size shall be provided wherever the pipes are crossing the walls / floors and sealing the sleeves with glass wool in between & fire sealant compound at either end all as per Project Manager's / Consultants requirements including cutting holes and chases in brick, R.C.C work and making good the same to original conditions complete in all respects. All hangers, clamps, brackets etc. shall be of galvanized iron unless specified otherwire and then supply of the same shall also be included for rates under this head.Welding of any kind on the galvanized support / hanger shall not be permitted including synthetic enamel paint of approved shade over a coat of zinc primer. <b>For wet riser System - MS `C' Heavy class pipe 25 mm dia</b>	15	M		
135	80 mm dia	5	M		
136	150 mm dia	50	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
137	Providing and fixing forged brass ball valve with forged brass ball suitable for test pressure of not less than 15 Kg. / sq.cm of the following size (Cost shall be inclusive of providing necessary union/flange connection 25 mm dia	5	No.		
138	Providing & fixing of butterfly valve (suitable for operating pressure of 16 Kg. / sqcm) with flanges, nut bolts, gaskets and necessary pad locking arrangement complete required. 150 mm dia	1	No.		
139	Providing & fixing <b>SS fire hydrant single landing valve</b> with 80 NB flanged inlet, brass spindle controlled 63 mm dia female instantaneous outlet type. SS coupling, blank cap, chain, twist release type lug & all accessories. Conforming to IS standard. Including fixing with anchor fastner and flanged tapping from wet riser and providing pressure gauge with SS ball valve complete as required.	5	No.		
140	Providing & fixing swinging type <b>First Aid hose reel in red colour drum</b> with 36 mts. long and 20 mm dia heavy duty thermoplastic water hose, 20 mm dia globe valve stop cock, terminating with SS coupling & nozzle of 6mm outlet with shut off valve confirming to IS 8090 - 1976 complete with MS socket for tap-off, drum and brackets (including painting) for fixing on wall with anchor fastner, bolts & nuts conforming to IS:884-1969 complete as required.	5	No.		
141	Providing & fixing non-perlocating, rubber reinforced lined fire hose pipe (as per IS : 636, Type A) of 63 mm dia and length as described below. The hose shall be rated for burst pressure of 35.7 Kg./sqcm. Hose shall be complete with ISI marked brass male & female coupling (IS:903) bound & rivetted to hose pipe with copper rivets & 1.5 mm copper wire. 15 m length	10	No.		
142	Providing and Fixing SS 63 mm dia instantaneous pattern <b>branch short pipe</b> , 20 mm dia nozzle conforming to IS standard, suitable for inter connection to hose pipe coupling complete as required.	5	No.		
143	Providing and fixing standard <b>firemans axe</b> with heavy rubber handle.	5	No.		
144	Providing and fixing 5 mm thick glass door ( <b>with M.S frame</b> ) of size 2.1 m x 0.9 m with center opening for fire hose cabinet. Suitably marked on the outside with the letters " <b>FIRE HOSE</b> " including looking arrangement. All MS work to be in Red PO colour over appropriate primer. The above item is only for masonry fire station.	5	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
145	<b>SPRINKLER, PIPING &amp; ACCESSORIES</b> Providing, laying, jointing and testing of following sizes of pipes conforming to IS-1239 with all accessories like all fittings (for pipes upto 50mm dia threaded forged steel fittings and for pipes above 50 mm dia MS fitting with welded joint shall be used) including tees, elbows, reducers, union, flanges, rubber gaskets, GI nuts bolts, washer including supporting/fixing the pipe on floor/wall/ceiling with clamps, hangers (using anchor fastners) as per specification. GI pipe sleeve of suitable higher size shall be provided wherever the pipes are crossing the walls / floors and sealing the sleeves with glass wool in between & fire sealent compound at either end all as per Project Manager's requirements including cutting holes and chases in brick, RCC work and making good the same to original conditions complete in all respects. All hangers, clamps, brackets etc. shall be of galvanized iron unless specified otherwire and then supply of the same shall also be included for rates under this head. Welding of any kind on the galvanized support / hanger shall not be permitted. <b>For Sprinkler system - MS `C' Heavy class pipe 25 mm dia</b>	1035	M		
146	32 mm dia	65	M		
147	40 mm dia	230	M		
148	50 mm dia	220	M		
149	65 mm dia	105	M		
150	80 mm dia	55	M		
151	100 mm dia	60	M		
152	150 mm dia	100	M		
153	Providing, fixing, jointing and testing in position the for drainage purpose following medium class (Class B) M.S pipes conforming to IS:1239 cut to required lengths including all necessary fittings (All fittings shall confirm to IS:1879 (part 1 to 10) and specials such as bends, tees, unions, Reducers, flanges & plugs etc. fixing at wall / ceiling level supported by clamps, hangers (using anchor fastners) etc, as per specification. MS pipe sleeves suitable higher size shall be provided wherever the pipes are crossing the fire rated walls / floors slab and sealing the sleeves with glasswool in between and fire sealent compound at either end all as per Project Manager's / Consultant requirement. All hangers, clamps, brackets etc. shall be of galvanized iron unless specified otherwise and the supply of the same shall also be included in rates under this head. 80 mm dia	10	M		
154	Supply, installation, testing and commissioning of electrically operated water flow switches (Vane type) including tamper switch and accessories, complete with tap off socket arrangement as required, with potential free contact with 2 No. NONC.	3	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	150 mm dia				
155	Providing & fixing of butterfly valve (suitable for operating pressure of 16 Kg. / sqcm) with flanges, nut bolts, gaskets and necessary pad locking arrangement complete required. 150 mm dia	4	No.		
156	Providing & fixing brass quartzoid sprinklers (UL approved) of 15 mm dia size, suitable for sustaining the pressure on the seat & water hammer effect. The type & temperature rating shall be as follows : Spray recessed (adjustable) rossette (68°C) sprinkler quick response pendant / upright type	576	No.		
157	Providing, fixing, testing & commissioning of U.L.listed / FM approved corrugated SS-304 Braided flexible sprinkler pipe droplet for 12 Kg. / sq. cm. working pressure with 1/2" BSP threaded outlet & 1" BSP threaded inlet with reducer nipple, snap, clamp, T-bar bracket etc. with necessary fitting complete as required. 1000 mm length	178	No.		
158	1200 mm length	110	No.		
159	Providing and fixing inspectors test assembly complete with test valve, sight glass sectional drain valve, 25mm and 50mm dia medium class (Class B) G.I. pipes conforming to IS:1239 cut to required lengths including threaded fittings, union with corrosion resistant orifice all complete strictly as per drawing.	4	No.		
160	<b>Portable Chemical Fire Extinguishers</b> <b>Supply, installation, testing and commissioning of following types of extinguisher with provision of wall bracket (fixed with anchor fastner).</b> <b>Supply, Installation, Fixing of CO2 type Fire Extinguisher of capacity 4.5 Kg. (6.8 Liter) confirms to IS 15683, bearing ISI mark, consisting of High Pressure seamless steel cylinder (IS:7285) and duly approved by Chief controller of Explosive Nagpur, fitted with wheel type valve, fully charged with CO2 gas (IS:15222), with non-conductor of electricity discharge PVC horn along with Bend Pipe, internally siphon tube &amp; mounting brackets having fire rating.</b>	5	No.		
161	Supply, Installation, Fixing of Stored Pressure (ABC Dry Chemical Powder) type Fire Extinguisher of Capacity 6 Kg. Confirms to IS 15683, bearing ISI mark complete with brass forged squeeze grip type valve fitted with pressure gauge, pressurize with dry Nitrogen gas filled, with discharge nozzle with wall mounting bracket, having fire rating of 3A & 21B. 6 Kg.	7	No.		
(iii)	<b>HVAC System BOQ</b>				

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
162	<b>HVAC : AIR DISTRIBUTION (FOR AIR CONDITIONING AREAS)</b> Supply, installation, balancing and commissioning of factory fabricated GSS sheet metal rectangular/round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required. Thickness 0.63 MM Galvanized Sheet Steel Ducting	2000	Sq.M		
163	Thickness 0.80 MM Galvanized Sheet Steel Ducting	800.00	Sq.M		
164	Thickness 1.0 MM Galvanized Sheet Steel Ducting	300.00	Sq.M		
165	Thickness 1.25 MM Galvanized Sheet Steel Ducting	100.00	Sq.M		
166	Supply, installation, testing and commissioning of GI volume control duct damper complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc, as per specifications.	12.00	Sq.M		
167	<b>SUPPLY / RETURN AIR DIFFUSERS:</b> Supplying, fixing testing commissioning of supply air diffusers of powder coated aluminium with aluminium volume control dampers with anti smudge ring & removable core.	15.00	Sq.M		
168	Supplying, fixing testing commissioning of Return air diffusers of powder coated aluminium without volume control dampers with anti smudge ring & removable core.	1.00	Sq.M		
169	<b>SUPPLY / RETURN AIR GRILLES :</b> Supplying & fixing of powder coated extruded aluminium Supply Air Grills with aluminium volume control dampers as per specifications.	35.00	Sq.M		
170	Supplying & fixing of powder coated extruded aluminium return air grill with louvers but without volume control dampers complete as required.	80.00	Sq.M		
171	Supplying, Fixing,testing and commissioning of thermal insulated flexible duct of following sizes duly supported at regular interval as per site requirement etc. complele as required as per specifications.200mm dia.	150	M.		
172	<b>FIRE DAMPERS :</b> Supplying, Fixing,testing and commissioning of fire dampers in supply air duct/main branch and return air path as and where required of required sizes i/c control wiring,the damper shall be motorized and spring return so as to close the damper in the event of power failure automatically and open the same in case of power being restored. The spring return action shall be inbuilt mechanism and not externally mounted. The damper shall also be closed in the event of fire signal complete as required and as per specifications. Fire damper	26	Sq.M		
173	Actuator	22	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
174	NON SCHEDULE ITEMS : Supplying , installation, testing & commissioning of external thermal insulation on ducts with Closed Cell Cross Linked Polyethylene Foam of density 33 + 3Kg./m <sup>3</sup> with 18mm thick & thermal Conductive not exceeding 0.033 W/mK at an average Temperature of 23°C. The Material Shall be rated as Class 1 and Class 0 , As per BS476 Part 7 and BS 476 Part 6 , The water vapour permeability $\mu$ factor shall be greater than 11000(Plain)as per DIN 52615. The Material shall have Fire Approval from CBRI - Roorkee. Duct insulated should be strapped by 12mm Plastic Packing strip at every random M & conforming to standard Spec. 19 mm thick (In Condition Space)	2200	Sq.M		
175	25 mm thick (In Non - Condition Space) for Exposed Area	400	Sq.M		
176	Supply, Installation, Testing and Commissioning of Acoustic lining inside ducts using Non Fibrous fire retardant cross-linked polyethylene foam of 30+/- 3 Kg./m <sup>3</sup> density & thickness of 12mm having porous surface on one side & a flat surface on other side using Synthetic rubber based Adhesive preferably Low VOC & high strength characteristic(Initial portion of ducting and main plenum) as per specifications	200	Sq.M		
177	Supplying, fixing acoustic lining on wall and ceiling of AHU rooms acoustic Insulation Material Shall be open Cell Melamine Foam in 35 mm Thickness to be covered with 7 mil 10X10 mesh glass cloth.The density of material shall be 8 to 11Kg./m <sup>3</sup> , Open Cell melamine foam shall be qualify the requisite Fire Characteristics for Class-1, "O" as per BS 476 Parts 6 and 7.NRC value as per ASTM C 423 shall be 0.46 for 15mm and 0.81 for 35 mm.operating temperature range should be -180°C to +180°C. as per specifications	600.00	Sq.M		
178	AIR HANDLING UNIT WITH VFD - Supply, Installation, testing & commissioning of double skin construction draw thru type AIR HANDLING UNITS (WITH VRF AHU KIT) as per specification, No. complete with filter section coil of copper tube & aluminium fins construction for chilled, squirrel cage induction motor, centrifugal fan and vibration isolators, coil size shall be selected for a maximum face velocity of 500 feet/minute. Motor shall be EFF-1 type suitable for 415±10% volts, 50 cycles, 3 phase AC supply. Total static pressure given below is minimum required for the system. Actual static pressure shall be calculated and confirmed by the vendor at the time of bidding. vendor shall quote for thermostate also. CSU=Ceiling Suspended unit FMU=Floor Mounted unit Filtration Required below:- Three stages of filtration consisting of Pre-filter, Microvee & HEPA filters upto 0.3 micron particle size. Two stages of filtration consisting of Pre-filter &	3.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	Microvee filter upto 5 micron particle size. One stage of filtration consisting of normal washable filters upto 20 micron particle size. VFD:- VFD designed for HVAC applications with built-in PID controller, control panel (keypad & display) , IP-65 enclosure (for outdoor applications) & IP-55 enclosure (for indoor applications) for use on standard centrifugal plug fans. The display should be in alpha-numeric characters and programming facility should be in user-friendly HVAC terminology. VFD's shall have built-in harmonic filters. No. VFD panel to be provided with digital display showing electrical paraMs like voltage, current and power consumption. No. VFD shall be installed in a dedicated external enclosure and the inter connecting wires between driver and MCC shall be included. Space/Banquet hall, Type/FM, CFM/7000, TR/18, Max Hp/5, Static/50, Filtration/I				
179	Supply Installation, testing and commissioning of Modulating imported VRF / VRV Outdoor Units with Heating-Cooling facility suitable for 415 + 10% for outdoor and 230 + 5% volts for Indoor units complete with indoor and out door units. ODU must have Scroll compressors (All Inverter) with capacity controlling compressor, and all the necessary accessories for proper functioning of the units, having following approximate capacities. Unit prices shall be included with top up R410A refrigerant. Note :Copper tubing / piping with all joints and U-Bends exposed to coastal areas corrosive atmosphere / aggressive ambient, shall be painted with special corrosion prevention coating either in factory or at site. <b>VRV Outdoor Units - 22HP</b>	3.00	No.		
180	Supplying, installing, testing and commissioning of Refnet joint (Y-Branches) branch distributors with Variable refrigerant flow distribution couplings for refrigerant piping in copper piping. The bidder shall consider the required diaM of the refnet joint as required for the system to get connected by refrigerant piping of suitable guage for it to function satisfactorily without leakage through the joints. cost shall also include insulation of 19mm / 13mm thick nitrile rubber closed type tubular foM	3.00	No.		
181	Supply of wired remote controller and system controller for units with LCD display etc.	3.00	No.		
182	Supply, installation, tesing & commissioning of channel iron 75mm x 40 mm x 6 mm (7.14 Kg./M) for VRV outdoor Unit as per specification.	150.00	Kg..		
183	Supplying, installing, testing and commissioning control cabling Cu.M transmission wiring of 3 core x 2.5 Sq.Mm copper in suitable PVC conduits between indoor and out door unit including all accesseries.	150.00	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
184	Supplying, installing, testing and commissioning ,interconnecting refrigerant copper pipe work with (19mm/13 mm thick) closed cell elastomeric nitrile rubber tubular insulation (Class-1 ) between No. set of indoor & outdoor units as per specifications, all piping inside the building shall be properly supported with MS hanger. refrigerant pipe insulation shall be cover with UL certified UV protective coating with 7 mill fiber glass cloth with two Coat system. Protective Coating shall be UL classified and should conform to UL for surface burning characteristics.The Protective Coating should conform to ASTM D 5590 standard for fungal resistance. 34.92 mm OD ( insulation 19mm)	80.00	M		
185	28.58 mm OD ( insulation 19mm)	40	M		
186	22.22 mm OD ( insulation 19mm)	40	M		
187	15.88 mm OD ( insulation 19mm)	80	M		
188	12.70 mm OD ( insulation 19mm)	40	M		
189	AXIAL FLOW FANS :- Supply, installation, testing and commissioning of AXIAL FANS for exhaust air suitable for installing in any position in Horizontal or vertical. The motor shall be of class F/H (H class wherever specified in the item, to withstand a temperature of 250 degree celcius for 2 hours) suitable for 415 V $\pm$ 10% volts three phase 50cycle, AC supply & meeting criterion as per ASHRAE standard 90.1-2010 and high efficiency (IS 12615) . The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. all normal application fans shall be provided with sound attanuator at inlet & outlet The fan shall be low RPM (less than 1450 RPM) and capacities shall be as follows : Duty : Ground Floor Audi exhaust & fresh air ( in case of fire) Air Quantity : 15000 CFM Static Pressure : 40 mm wg Fan Motor H.P: 10 H.P Class-H Motor or as per actual selection meeting other technical paraMs	2	No.		
190	Duty : Ground Floor Doual height entrance exhaust air ( in case of fire) Air Quantity : 7000 CFM Static Pressure : 40 mm wg Fan Motor H.P: 5 H.P Class-H Motor or as per actual selection meeting other technical paraMs	1	No.		
191	Duty : Ground Floor Exhibition 1 & 2 exhaust air ( in case of fire) Air Quantity : 18000 CFM Static Pressure : 40 mm wg Fan Motor H.P: 10 H.P Class-H Motor or as per actual selection meeting other technical paraMs	1	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
192	Duty : 1st Floor Exhibition 1 exhaust air ( in case of fire) Air Quantity : 9000 CFM Static Pressure : 40 mm wg Fan Motor H.P: 5.5 H.P Class-H Motor or as per actual selection meeting other technical paraMs	1	No.		
193	Duty : 1st Floor Exhibition 2 exhaust air ( in case of fire) Air Quantity : 6000 CFM Static Pressure : 40 mm wg Fan Motor H.P: 5 H.P Class-H Motor or as per actual selection meeting other technical paraMs	1	No.		
194	Duty : 2nd Floor Exhibition 1 exhaust air ( in case of fire) Air Quantity : 9000 CFM Static Pressure : 40 mm wg Fan Motor H.P: 5.5 H.P Class-H Motor or as per actual selection meeting other technical paraMs	1	No.		
195	Duty : 2nd Floor Exhibition 2 exhaust air ( in case of fire) Air Quantity : 6000 CFM Static Pressure : 40 mm wg Fan Motor H.P: 5 H.P Class-H Motor or as per actual selection meeting other technical paraMs	1	No.		
196	Duty : 2nd Floor banquet hall exhaust air ( in case of fire) Air Quantity : 6500 CFM Static Pressure : 40 mm wg Fan Motor H.P: 5 H.P Class-H Motor or as per actual selection meeting other technical paraMs	3	No.		
197	Supply, fabrication, installation and testing the flexible connections constructed of fire resistance flexible double canvas sleeve as per the approved shop drawings.	10	Sq.M		
198	Supply, installation and balancing of extruded aluminium powder coated air louvers complete with aluminium wire mesh birdscreen & volume control dampers as per specifications. Fresh air louvers	1	Sq.M		
199	Exhaust air louvers(without volume control dampers)	10	Sq.M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
200	<p>ASSOCIATED ELECTRICAL WORKS WITH HVAC SYSTEM                      CONTROL PANEL IN AIR HANDLING UNIT                      Design, manufacture, supply, installation, testing and commissioning of the following cubicle type, wall mounted control panels including anchoring into the wall, wiring and earthing terminating into MPCB in No. panel shall be provided by the electrical contractor. All outgoing shall be provided with Stop / Manual /Auto selector switch to facilitate operation through BAS. All starters shall be provided with potential free Contact for Connections to Building Automation System.                      single phase preventer (Electronics type) as per the ratings given below.                      Terminal block for power distribution.                      Power Contactor.                      Phase indicating lights and indicating light for ON/OFF/TRIP status phase sequence relay shall also be provided.                      96 mm x 96 mm digital voltM and amM with selector switches.                      Time delay relay for delayed automatic restart of air handling unit motor.(0-180 Sec).                      Wiring for microswitch for starting / stopping the fan when fire damper closes / Power supply for fire damper control panel.                      For on/off/remote and local operation, 3 pole single throw switch shall be provided in No. AHU panel to facilitate override of the automatic operation.                      All starters shall be provided with suitable potential free contract for connections to the Building Automation System.                      The number of AHU control panels shall be as follows.                      40A TPN MCB with 5 HP Three phase DOL starter with overload relay and single phase preventer and relay for Fire Detector command tripping. No. of these compartment shall contain indicating lamp with ON/OFF/ TRIP status of motors.</p>	3	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
201	CONTROL PANELS FOR AXIAL FANS Design, manufacture, supply, installation, testing and commissioning of the following cubicle type, wall mounted control panels including anchoring into the wall, wiring and earthing terminating into MPCB in No. panel shall be provided by the electrical contractor. All outgoing shall be provided with Stop / Manual /Auto selector switch to facilitate operation through BAS. All starters shall be provided with potential free Contact for Connections to Building Automation System. Over-load relay, suitable for motor duty and able to withstand fault level of 10 KA. single phase preventer (Electronics type) as per the ratings given below. Terminal block for power distribution. Power Contactor. Phase indicating lights and indicating light for ON/OFF/TRIP status phase sequence relay shall also be provided. 96 mm x 96 mm voltM and amM. Time delay relay for delayed automatic restart of motor (0-180 sec). Wiring for microswitch for starting / stopping the fan (in case of fire) / Power supply for damper control panel. For on/off/remote and local operation, 3 pole single throw switch shall be provided in No. panel to facilitate override of the automatic operation. All starters shall be provided with suitable potential free contract for connections to the Building Automation System. The number of control panels shall be as follows. 63A TPN MCCB with 10HP Three phase star delta starter with overload relay and single phase preventer . No. of these compartment shall contain indicating lamp with ON/ OFF/ TRIP status for fan sections/axial fans.	3	No.		
202	40A TPN MCB with 5/5.5 HP Three phase DOL starter with overload relay and single phase preventer . No. of these compartment shall contain indicating lamp with ON/ OFF/ TRIP status for fan sections/axial fans.	8	No.		
203	Supply, installation, testing and commissioning of 63 Amps 4 pole MCB's (For VRV Outdoor Unit) in MS Painted enclosure of approved make design and painted with approved paint shade.	6	No.		
204	Supplying and making end termination with brass double compression gland and aluminium/copper lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required. 4 core, 10 Sq.mm Aluminium cable	150	M		
205	4 core, 6 Sq.mm. copper cable	200	M		
206	<b>DSR ITEMS</b> Supplying and installing following size of perforated M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc as required. 100 mm width x 50mm depth x 1.6 mm thickness.	100	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
207	150 mm width x 50mm depth x 1.6 mm thickness.	50	M		
208	300 mm width x 50mm depth x 1.6 mm thickness.	25	M		
209	<b>EARTHING</b> Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	50	M		
210	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.	100	M		
(iv)	<b>AV System BOQ</b>				
211	<b>AV WORK Auditorium 219 seating capacity SOUND REINFORCEMENT SYSTEM - SITC</b> of Multi-pattern Desktop Gooseneck Microphone, Element : Dual Condenser (back-electret) , Frequency Response : 50 - 20,000 Hz, Impedance : 200 Ω, Mic Type : Gooseneck (18 inch) , Open Circuit Voltage : 5.6 mV/Pascal, Polar Pattern : Omni, Cardioid, Supercardioid, Hypercardioid	8.00	No.		
212	UHF Handheld Wireless Microphone System, PLL Synthesized, dynamic microphone, 1112 possible channels, +/- 40 kHz modulation, Radiated Output : 30 mW, RF Sensitivity < 1.0 mV, Image Rejection > 60 dB, Frequency Response : 50 – 15 kHz +/- 2 dB, Distortion <1.0%, Dynamic Range >100 dB, Battery Life : > 8 hours with 9-Volt Alkaline.	2.00	No.		
213	UHF Lapel Wireless Microphone System, PLL Synthesized, Omni -Directional Polar pattern, 1112 possible channels, +/- 40 kHz modulation, Radiated Output : 30 mW, RF Sensitivity < 1.0 mV, Image Rejection > 60 dB, Frequency Response : 50 – 15 kHz +/- 2 dB, Distortion <1.0%, Dynamic Range >100 dB, Battery Life : > 8 hours with 9-Volt Alkaline.	2.00	No.		
214	UHF antenna/power distribution system for providing power and RF signals for 4 units.	1.00	No.		
215	Ground independent remote mountable half-wave omni-directional antenna.	2.00	No.		
216	SITC 16 Channel high performance Mixer unit with 12 Mic/Line + 4 Mic/Stereo Line Channels, 6 x AUX, Dual 24 bit Stereo Effects, USB-Audio Interface, Frequency Response : 15 Hz to 70 kHz, THD < 0.005%.	1.00	No.		
217	Professional Digital USB / SD Recorder and Player for recording directly to a USB thumb drive or an SD/SDHC card. color LCD screen and a jog wheel for easy system navigation.	1.00	No.		
218	Audio Press Distribution box with 12 Output and Distribution Amplifier with individual gain controls and isolated outputs.	1.00	No.		
219	Supply, Installation, Testing and Commissioning of Networkable Digital Signal Processor having min 12 AEC Inputs and 12 Outputs with IP/RS-232 Control ort; having integrated digital bus/network for expansion of inputs and output ports. The processor shall have programmable DSP like compressor, limiters, EQ, duckers, feedback control etc. complete with standard accessories complete as required.	1.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
220	Dual 3.5" Two Way Surface Mount loudspeaker, Vented LF enclosure, 0.75" titanium diaphragm HF driver with neodymium magnetic structure, Elliptical weather resistant ABS enclosure, Frequency Range (-10 dB) : 85 - 20,000 Hz , Sensitivity, SPL 1 W/1 m : 87 dB , Power Handling (Continuous, Peak) : 75, 300W , Transformer Taps: 70V:5W, 100V:10W. (GREEN ROOM + CONTROL ROOM)	6.00	No.		
221	Dual Channel 400W Power amplifier at 70V or 4 Ohm, Thermal protection, peak limiting, turn-on delay, Frequency Response : 65-20 kHz, Signal to Noise ratio : 103dB, THD < 0.1%, Selectable 50 Hz or 300 Hz high pass filter, 230 vac operation.	2.00	No.		
222	SITC of Main FOH Line Arrayable Speaker Single 12" Two way Full range loudspeaker with 500W continuous Power, 2000W Peak @ 8Ohm, Coverage (Horizontal x Vertical ) : 60-80 deg x 30-40 deg, Sensitivity 98dB, Max SPL Peak 131 dB, 2" HF Compression driver, Frequency response (-3dB) : 58 Hz - 16 kHz, 13 Ply Weather Resistant Birch Enclosure, suspension M10 Threaded Points , with stacking facility for 2 speakers.	4.00	No.		
223	Vertical Arraying Coupling Bracket for FOH Speakers.	2.00	No.		
224	SITC of dual 12" Subwoofer, Front-Loaded, Frequency Response (-3 dB) : 54 - 145 Hz, Sensitivity (SPL, 1W/1m): 100 dB, Max. SPL Peak @ 1m : 135 dB, System Power Handling (Continuous, Program, Peak) : 800W, 1600W, 3200W, Nominal Impedance : Passive: 4Ω, 13 Ply Weather Resistant Birch Enclosure.	1.00	No.		
225	SITC of Class H/D Dual channel power amplifier with Power : 1300W @ 4 ohms, 2200W @ 2 ohms, 650W@8Ohm per channel, Max Bridged Output Power : 4400W @ 4 ohms, Frequency Response : 10Hz - 21 KHz (+/- 1bB), THD: < 0.05%, Signal to noise ratio : >107 dB , On-board DSP includes multi-band PEQs, crossovers, limiters and delay per channel; True channel grouping control with extra DSP capabilities including GEQ.	3.00	No.		
226	SITC of 12" two way powered stage monitor Loudspeaker : 55Hz - 20kHz (-10dB), Max SPL 131dB SPL, Coverage (H X V) : 90 X 50 degree, inbuilt amplifier of class D delivering a power of 1000W or more, 1.5" HF Titanium Compression Driver.	2.00	No.		
227	4 point Floor junction box complete with standard accessories	4.00	No.		
228	Equipment Rack for housing Amplifiers, controller, consisting of mains panel, Fan tray for ventilation, power distribution, cable channel etc as required.	1.00	No.		
229	1.5 sq mm two core speaker cable. <b>(Klotz / Beldon)</b>	600	M		
230	2.5 sq mm two core speaker cable. <b>(Klotz / Beldon)</b>	600	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
231	2 Core Shielded Microphone Cable. <b>(Klotz / Beldon)</b>	600	M		
232	Connectors and other Miscellaneous accessories as required.	1.00	Lot		
233	<b>VIDEO DISPLAY FOR AUDITORIUM</b> -Supply, Installation, Testing and Commissioning of Single Chip DLP Solid state laser projector of 8000 center Lumens or better brightness, WUXGA 1920 x 1200 or better resolution, 16:10 aspect ratio, 1200:1 or better contrast ratio, life of light source 20,000 Hrs, having Inputs of 1 x HDBaseT, 2 x HDMI or better, 3GSDI x 1 (BNC) or better , RS232 , Ethernet (10/100) RJ45, along with suitable short throw lens 0.7-0.95 for as required at site.	1.00	No.		
234	Supply and Fixing of Motirized High Gain Tab Tensioned projection screen of of approx 230 - 250 Inch diagonal, heavy duty motor.	1.00	No..		
235	SITC of Confidence monitor on stage with 4K resolution 55" LED Display with OPS slot, Min 400 Nits brightness, USB media Player, HDMI IN, Built in Wireless LAN, Built-in Speaker with Wodden enclosure to be mounted at 30-45 degree on floor	2.00	No.		
236	Multiformat Active Table Plate Transmitter with 1 x HDMI, 1 x VGA, 1 x Audio, 1x USB, sends signal over HDMI/ VGA/ Audio/USB on single CAT-5/6 Sheilded Twisted Pair Cable minimum 100 M, Handles computer resolutions up to WUXGA.	2.00	No.		
237	Multimedia Matrix switcher with Minimum 3 HDMI Input, 2 VGA, 2 x HD-baseT Input, 3 Component, S-Video, or Composite, Output : 2 x HDMI, 2 x HD-Base-T Out, Integrated or External controller for controlling projector, Screen, lighting etc. controller should have 512 MB RAM, 4 GB Flash, 4 x IR, 1 x Relay, 2 x COM port, Integrated / External 4 channel Audio DSP with mic / line inputs.	1.00	No.		
238	7" Wired Touch panel for control of Audio Video System, TFT Active matrix color LCD, resolution : 800 x 480 pixels, Brightness : 300 nits (cd/m <sup>2</sup> ), Contrast : 450:1, Edgelit LED, Built in Microphone and speaker.	1.00	No.		
239	I Pad 16 GB for touch control of AV system Over wifi like Projector and LED Display Power on/off, Motorized screen Up/down control, Source switching etc. with Software for Controlling Audio Video.	1.00	No.		
240	HDMI 4K Receiver with HDBaseT input with built in 4K scalar, supports cable length up to 100 M for 1080P resolution, IR, RS-232 and Ethernet Control.	2.00	No.		
241	Transmitter with 1 x HDMI, 1 x VGA, 1 x Audio, 1x USB, sends signal over HDMI/ VGA/ Audio/USB on single CAT-5/6 Sheilded Twisted Pair Cable minimum 90 M, Handles computer resolutions up to WUXGA.	1.00	No.		
242	8-port LAN Switch <b>(CISCO/NETGEAR/D-Link)</b>	1.00	No.		
243	HDMI - HDMI Cable 1.8 M	25.00	No.		
244	HDMI - HDMI Cable 5 M	4.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
245	HDMI - HDMI Cable 10 M	2.00	No.		
246	VGA and Audio Cable 1.8 M	6.00	M		
247	4-pair CAT5e shielded twisted pair (STP) cable, Mutual Capacitance 17.1 pF / ft, Propagation Delay Skew 45nS / 100 m, DC Resistance 28.6 Ohms / 1000 ft maximum.	400.00	M		
248	<b>BANQUET HALL VIDEO SYSTEM</b> -Supply, Installation, Testing and Commissioning of Single Chip DLP Solid state laser projector of 6000 Lumens ISO or better brightness, WUXGA 1920 x 1200 or better resolution, 16:10 aspect ratio, 1000000:1 or better contrast ratio, life of light source 20,000 Hrs, having Inputs of 1 x HDBaseT, 1 x HDMI, , RS232 , Ethernet (10/100) RJ45, along with suitable short throw lens 0.7-0.95, Built-in warping and blending as required at site.	3	No..		
249	site of 135-140 inch diagonal Motorized projection screen	3	No..		
250	Supply, Installation, testing and commissioning of Video over Twisted pair transmitter with 2x HDMI Inputs, 1x HDMI Outputs, 1x USB 2.0, Balanced Analog Audio I/O & Control (RS232 & IR) supporting transmission of 4K60 4:4:4 with HDR (High Dynamic Range) HDR10 or better. It should have 10/100/1000 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, CIP, DHCP, SSL, TLS, SSH, SFTP (SSH File Transfer Protocol), IEEE 802.1x, IPv4, HTTPS web browser setup and control Ethernet/LAN port. It should be HDCP 2.2 Compliant. It should employ advanced security features and protocols like 802.1x authentication, Active Directory credential management, LDAP directory management, PKI certification, AES encryption, TLS, SSH, IGMP V2/V3 and HTTPS( for control room PC )	3	No..		
251	Supply, Installation, testing and commissioning of Twisted pair receiver with 1x HDMI Outputs, 1x USB 2.0, Balanced Analog Audio I/O & Control (RS232 & IR). It should have a 4K60 4:4:4 video scaler with motion-adaptive DE interlacing, intelligent frame rate conversion, Deep Color support, HDR10 support, widescreen format selection (zoom, stretch, maintain aspect-ratio, or 1:1) to connect to different displays. It must have a Video Wall Functionality. It should have 10/100/1000 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, CIP, DHCP, SSL, TLS, SSH, SFTP (SSH File Transfer Protocol), IEEE 802.1x, IPv4, HTTPS web browser setup and control Ethernet/LAN port. It should be HDCP 2.2 Compliant. It should employ advanced security features and protocols like 802.1x authentication, Active Directory credential management, LDAP directory management, PKI certification, AES encryption, TLS, SSH, IGMP	4	No..		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	V2/V3 and HTTPS` ( 4 No. for Large LED screen, 6 for 65" LED screen )				
252	Control Unit, with 3 Com ports (RS-232/422/485), 8 IR/serial ports, 8 I/O ports, 8 Low-voltage relay ports, Ethernet Port, for control of projector, screen , wired button control panel etc.	1.00	No.		
253	7" Wired Touch panel for control of Audio Video System, TFT Active matrix color LCD, resolution : 800 x 480 pixels, Brightness : 300 nits (cd/m <sup>2</sup> ), Contrast : 450:1, Edgelit LED, Built in Microphone and speaker.	3.00	No.		
254	Multiformat Plate with 2 x HDMI, 1 x Audio, 1x USB,	3.00	No.		
255	HDMI - HDMI Cable 1.8 M	12.00	No.		
256	HDMI - HDMI Cable 5 M	3.00	No.		
257	CAT 6 Ethernet Cable	300.00	M		
258	Network Based switcher 24 Port 10/100/1000 gigabit managed POE Switch, QOS Support, IPV4/IPV6 Support, Advance Security Management, Switching Capacity in Gigabits per Second: 104.0Gbps, Non-blocking ports and Internet Group Management Protocol: IGMP V2/V3, Mac, windows, Linux Compatible.	1.00	No..		
259	<b>BANQUET HALL SOUND SYSTEM</b> -Two Way Ceiling Speaker 30 watt RMS at 100 V, Driver size minimum 6 inch or better, Max SPL 110 dB-SPL peak @ 1m (pink noise), Frequency range (-10dB) : 70 Hz - 20 kHz, saftey : EN-60065.	36	No..		
260	Supply, Installation, Testing and Commissioning of Networkable Digital Signal Processor having min 12 AEC Inputs and 12 Outputs with IP/RS-232 Control port; having integrated digital bus/network for expansion of inputs and output ports. The processor shall have programmable DSP like compressor, limiters, EQ, duckers, feedback control etc. complete with standard accessories complete as required.	1	No..		
261	Dual Channel 400W Power amplifier at 70V or 4 Ohm, Thermal protection, peak limiting, turn-on delay, Frequecny Response : 65-20 kHz, Signal to Noise ratio : 103dB, THD < 0.1%, Selectable 50 Hz or 300 Hz high pass filter, 230 vac operation.	3.00	No.		
262	UHF Handheld Wireless Microphone System, PLL Synthesized, dynamic microphone, 1112 possible channels, +/- 40 kHz modulation, Radiated Output : 30 mW, RF Sensitivity < 1.0 mV, Image Rejection > 60 dB, Frequency Response : 50 – 15 kHz +/- 2 dB, Distortion <1.0%, Dynamic Range >100 dB, Battery Life : > 8 hours with 9-Volt Alkaline.	3.00	No.		
263	UHF Lapel Wireless Microphone System, PLL Synthesized, Omni- Directional Polar pattern, 1112 possible channels, +/- 40 kHz modulation, Radiated Output : 30 mW, RF Sensitivity < 1.0 mV, Image Rejection > 60 dB, Frequency Response : 50 – 15 kHz +/- 2 dB, Distortion <1.0%, Dynamic Range >100	3.00	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	dB, Battery Life : > 8 hours with 9-Volt Alkaline.				
264	Multi-pattern Desktop Gooseneck Microphone, Element : Dual Condenser (back-electret) , Frequency Response : 50 - 20,000 Hz, Impedance : 200 Ω, Mic Type : Gooseneck (18 inch) , Open Circuit Voltage : 5.6 mV/Pascal, Polar Pattern : Omni, Cardioid, Supercardioid, Hypercardioid	3.00	No.		
265	UHF antenna/power distribution system for providing power and RF signals for 4 units.	3.00	No.		
266	Ground independent remote mountable half-wave omni-directional antenna.	6.00	No.		
267	Equipment Rack for housing Amplifiers, controller, consisting of mains panel, Fan tray for ventilation, power distribution, cable channel etc as required.	1.00	No.		
268	1.5 sq mm two core speaker cable. <b>(Klotz / Beldon)</b>	400	M		
269	2 Core Shielded Microphone Cable. <b>(Klotz / Beldon)</b>	600	M		
270	Connectors , Patch Cable, Patch Panels , and other Miscellaneous accessories as required.	1.00	Lot		
<b>(v)</b>	<b>Electrical &amp; ELV BOQ</b>				
271	ELECTRICAL CIRCUIT Cu.M POINT WIRING : Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required. Group C	24	No.		
272	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed PVC conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required. Group C	16	No.		
273	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 amps modular socket outlet and 5/6 amps modular switch, connection etc. as required. (For light plugs to be used in non residential buildings).	58	No.		
274	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 A & 15/16 A modular socket outlet and 5/16 A modular switch, connections etc. as required.	114	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
275	Supplying and fixing 3 pin, 5 A ceiling rose on the existing junction box/ wooden block including connections etc. as required.	1	No.		
276	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required. Telephone socket outlet	16	No.		
277	Data socket outlet	64	No.		
278	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required. 25 mm	3660	M		
279	Supplying and fixing following Modular base & cover plate on existing modular metal boxes etc. as required. 1 or 2 Module	80	No.		
280	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required 2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	33953.5	M		
281	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	696	M		
282	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	1368	M		
283	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed Steel/ PVC conduit as required.	5490	M		
284	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required. 20 Pair-0.6mm	100	No.		
285	Supply, Installation, testing and Commissioning of following telephone teg block 10-30 Pair	2	No.		
286	50 Pair	1	No.		
287	Supply & instalation of 6 core Indoor/outdoor OM3 Unarmoured Multimode Optical Fiber	200	M		
288	Supply, installation, testing and commissioning of CISCO Make Layer-2, 24 port DATA switch as required.	5	Set		
289	Supply, installation, testing and commissioning of CISCO Make Layer-3, 12 port DATA switch enclosure etc. as required.	1	Set		
290	Supply, installation, testing and commissioning of CISCO/aruba /ruesh Make router (ABGN) for indoor solution, suitable to creat Wi-Fi on entire floor as required.	6	Set		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
291	Supply, installation, testing and commissioning of CAT-6 Patch cable upto 1.2M length as required.	122	Set		
292	Wall /Floor Mount Rack Enclosure Cabinet suitable for Data Patch Panel /Data switch , Constructed with a hinged wall mounting bracket and a sturdy steel frame, suitable to accommodate up to 200 lbs. of equipment in 15U of rack space. Four adjustable vertical mounting rails with square holes accommodate all standard 19-inch rack equipment. easy access to rackmounted equipment, the enclosure cabinet is hinged to swing away from the wall mounting bracket, perforated lockable side panels and front door, assuring generous airflow to keep equipment operating safely. The front door shall be reversible and the side panels are removable for easy access to equipment. The top and bottom panels of the enclosure include convenient cable routing ports. 15U	5			
293	42U	1			
294	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc. in the existing trench, complete as required. 63 mm dia (OD-63 mm & ID-51 mm nominal)	80	M		
295	<b>LIGHTING FIXTURES:</b> Supply, installation, testing and commissioning of Recessed Lighting , One Spot Light Installation with Ball Catch System 18W COB LED with 2210 Lumens, 5000K with 40 Degree Light Distribution along with Honeycomb Louver, 360* Rotatable and 35* Tilttable, less than 3 MacAdam Binning, CRI > 90, Minimum 80% Luminous Flux after 50,000 Hours. DALI LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, DALI control input, 1 %-100 % dimming range, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours.(for auditorium)-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	88	No.		
296	Supply, installation, testing and commissioning of Recessed Lighting Level, One Spot Light Installation with Ball Catch System 46W COB LED with 5030 Lumens, 5000K with 25 Degree Light Distribution along with HoneyComb Louver, 360* Rotatable and 35* Tilttable, less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. DALI LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, DALI control input, 1 %-100 % dimming range, lacquer coating	72	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours . (for auditorium)(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)				
297	Supply, installation, testing and commissioning of Recessed Round Spot Light with Honey Comb Louver, Fixture Made of Die Cast Aluminium, 18W COB LED with 2210 Lumens, 5000K, Titable 18*, Improved Glare Reduction through Deep Recessed mounting with Passive cooling of LEDs with Optimised Heat sink Geometry and High Quality Reflector made of Pure Aluminium having precise radiation characteristics, less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. DALI LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, DALI control input, 1 %-100 % dimming range, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours.(for auditorium Stage)-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	48	No.		
298	Supply, installation, testing and commissioning of Recessed Round Spot Light with Louver, Fixture made of Die cast Aluminium with Trimless Offset Mounting set, 26W COB LED with 3200 Lumens , 5000K, 360* Rotatable and Titable 35*, Improved Glare Reduction through Deep Recessed mounting with Passive cooling of LEDs with Optimised Heat sink Geometry and High Quality Reflector with Spherical facet finish, Precise radiation characteristics, less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. Non Dim LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours(for auditorium Stage/BANQUET HALL)-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	134	No.		
299	Supply, installation, testing and commissioning of Round Luminaire housing made from Die Cast Aluminium housing with Trim, 19W LED with 2100 Lumens, 5700k , DLOR 77%, Homogeneously illuminated Micro Prismatic Cover for reducing Luminance and Glare, LEDs having less than 3	26	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. Tunable White Color Temperature against Controls to match different lighting scenarios. NON DIMLED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours.(AUDITORIUM BACK STAGE 30 )-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)				
300	Supply, installation, testing and commissioning of Recessed Round Spot Light with, Fixture Made of Die Cast Aluminium, 18W COB LED with 2210 Lumens, 5000K, Tiltable 18°, Improved Glare Reduction through Deep Recessed mounting with Passive cooling of LEDs with Optimised Heat sink Geometry and High Quality Reflector made of Pure Aluminium having precise radiation characteristics, less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. NON DIM LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours.(AUDITORIUM PREFUNCTION )-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	44	No.		
301	Supply, installation, testing and commissioning of COB LED source downlight QL R-FJAA FRDL 10W with Dali Dim driver 43mm cutout, optical lens for enhanced lighting output, LED driver 9V-250mA, 230V-50Hz, housing and mounting ring made of high pressure die cast aluminum with white/silver/black powder coating options, light source COB LED with optical lens, long life LED source with 50000 hours L70F10, CRI>80, minimum 500 lumens output, CCT 3000K, beam angle 25°/40°, IP20, CE, RoHS. (EXHIBITION AREA)-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	250	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
302	Supply, installation, testing and commissioning of TIMO 80 Free 3 Phase Track Light made of Die Cast Aluminium, 18W COB LED having 2210 Lumens, 5000K, with Honey Comb Louver, 38* Degree Beam Angle, 355* Rotatable and 90* Tilttable Outward, White/Black Powder Coated with Interegated Converter, Passive cooling of LEDs with Optimised Heat sink Geometry and High Quality Reflector made of Pure Aluminium having precise radiation characteristics, less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. DALI LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, DALI control input, 1 %-100 % dimming range, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours.(EXHIBITION AREA)-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	40	No.		
303	Supply, installation, testing and commissioning of TIMO 80 Free 3 Phase Track Light made of Die Cast Aluminium, 26W COB LED having 3200 Lumens, 5000K, with Honey Comb Louver, 38* Degree Beam Angle, 355* Rotatable and 90* Tilttable Outward, White/Black Powder Coated with Interegated Converter, Passive cooling of LEDs with Optimised Heat sink Geometry and High Quality Reflector made of Pure Aluminium having precise radiation characteristics, less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. DALI LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, DALI control input, 1 %-100 % dimming range, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours.(EXHIBITION AREA)-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	40	No.		
304	Supply, installation, testing and commissioning of Global make Led surface mounted track patti with live end cap with Dead end with St connector. (EXHIBITION AREA)-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	80	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
305	Supply, installation, testing and commissioning of Clax 80 K Deep Recessed Round Spot Light with , Fixture Made of Die Cast Aluminium, 18W COB LED with 2210 Lumens, 5000K, Tltable 18*, Improved Glare Reduction through Deep Recessed mounting with Passive cooling of LEDs with Optimised Heat sink Geometry and High Quality Reflector made of Pure Aluminium having precise radiation characteristics, less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. DALI LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, DALI control input, 1 % - 100 % dimming range, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours.(EXHIBITION AREA)-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	54	No.		
306	Supply, installation, testing and commissioning of MIRA Square 150, Square Luminaire housing made from Die Cast Aluminium housing with Trim, 19W LED with 2100 Lumens, 5700K, DLOR 77%, Homogeneously illuminated Micro Prismatic Cover for reducing Luminance and Glare, LEDs having less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. Tunable White Color Temperature against Controls to match different lighting scenarios. LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours.(TEMPORARY EXHIBITION FIRST & SECOND FLOOR)-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	568	No.		
307	Supply, installation, testing and commissioning of Sasso 80 Deep Recessed Round Spot Light with , Fixture made of Die cast Aluminium with Trimless Offset Mounting set, 18W COB LED with 2210 Lumens , 5000K, 360* Rotatable and Tltable 35*, Improved Glare Reduction through Deep Recessed mounting with Passive cooling of LEDs with Optimised Heat sink Geometry and High Quality Reflector with Spherical facet finish, Precise radiation characteristics, less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, lacquer coating	57	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours-(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)				
308	Supply, installation, testing and commissioning of Clax 80 K Deep Recessed Round Spot Light with , Fixture Made of Die Cast Aluminium, 18W COB LED with 2210 Lumens, 5000K, Tltable 18*, Improved Glare Reduction through Deep Recessed mounting with Passive cooling of LEDs with Optimised Heat sink Geometry and High Quality Reflector made of Pure Aluminium having precise radiation characteristics, less than 3 MacAdam Binning, CRI > 80, Minimum 80% Luminous Flux after 50,000 Hours. LED Driver should be Protected up to 4 kV power network fast transients, High efficiency, 0.87, Built in strain relief for independent use, lacquer coating provides improved robustness in challenging climate conditions (humidity, temperature). Operating Voltage range 198 - 264 VAC, External NTC thermal input, and considering all recommendations in EN 60598 having Driver life time of more than 50000 Hours.(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	74	No.		
309	Supply, installation, testing and commissioning of LED strip QL DLS19.2W 5630-30-24X, high brightness single colour LED strip with aluminum profile, 19.2w/M, 60 LED/M, 30 LED/module, 5630 SHARP SMT package, efficacy 112 lumens/ watt, CCT 3000K/6000K, high luminous intensity, size 12mm (W) x 495mm (L) x 1.6mm (H), slim design, with DALI dimming driver 24V DC, high reliability, 0.4A current, solid state high shock vibration resistant, beam angle 120°, maintenance free easy installation long life > 50000 hours L70, operating temperature - 20° to +60°, very low power consumption and low heat, cuttable size 99mm, good thermal conductivity, aluminum PCB, 9.6 watt/module, LED package size: 5.6mm x 3.0mm x 0.87mm, SMD type top view, IP20.(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	1264	M		
310	Supply, installation, testing and commissioning of LED strip QL DLS9.6W 3014-TWIN, high brightness single colour dual line LED strip with aluminum profile, 9.6w/M, 120 LED/M, 84 LED/module, 3014 SHARP DURIS E3 SMT package, efficacy 112 lumens/ watt, CCT 3000K/6000K, high luminous intensity, size 8mm (W) x 700mm (L) x 1.6mm (H), slim design, with DALI dimming driver 24V DC, high reliability, 0.56A current, solid state high shock vibration resistant, beam angle 120°, maintenance free easy installation long life > 50000 hours L70, operating	250	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	temperature -20° to +60°, very low power consumption and low heat, cuttable size 50mm, good thermal conductivity, FR4 PCB, 6.72 watt/module, LED package size: 3.0mm x 1.4mm x 1.2mm, SMD type top view, IP20.(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)				
311	Supply, installation, testing and commissioning of LED strip QL DLS19.2W 5630-30-24X, high brightness single colour LED strip with aluminum profile, 19.2w/M, 60 LED/M, 30 LED/module, 5630 SHARP SMT package, efficacy 112 lumens/ watt, CCT 3000K/6000K, high luminous intensity, size 12mm (W) x 495mm (L) x 1.6mm (H), slim design, with DALI dimming driver 24V DC, high reliability, 0.4A current, solid state high shock vibration resistant, beam angle 120°, maintenance free easy installation long life > 50000 hours L70, operating temperature - 20° to +60°, very low power consumption and low heat, cuttable size 99mm, good thermal conductivity, aluminum PCB, 9.6 watt/module, LED package size: 5.6mm x 3.0mm x 0.87mm, SMD type top view, IP20.(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	70	M		
312	Supply, installation, testing and commissioning of LED strip QL DLS19.2W 5630-30-24X, high brightness single colour LED strip with aluminum profile, 19.2w/M, 60 LED/M, 30 LED/module, 5630 SHARP SMT package, efficacy 112 lumens/ watt, CCT 3000K/6000K, high luminous intensity, size 12mm (W) x 495mm (L) x 1.6mm (H), slim design, with DALI dimming driver 24V DC, high reliability, 0.4A current, solid state high shock vibration resistant, beam angle 120°, maintenance free easy installation long life > 50000 hours L70, operating temperature -20° to +60°, very low power consumption and low heat, cuttable size 99mm, good thermal conductivity, aluminum PCB, 9.6 watt/module, LED package size: 5.6mm x 3.0mm x 0.87mm, SMD type top view, IP20.(XAL, QLITE, FOSNOVA, DISANO, WEVER DUCRE)	100	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
313	<p>MAIN DISTRIBUTION AND SUB DISTRIBUTION PANELS: Supply, Installation, Testing &amp; Commissioning of MDB Panel-1 (Left side- Lighting, Power &amp;AHU) , cubicle type, made out of min 2mm thick CRCA sheet (load bearing), totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system, including internal wiring with suitable size wires, rotary handle, spreaders, 3mm thick gland plate, hinged type door with neoprene / PU gasket etc. The panel shall include supply &amp; installation of following switchgears, Ming instruments and accessories as per specification.</p> <p>Incomer                      400 A TPN 35kA MCCB with Microprocess release with adjustable inbuilt Over Load, Short Circuit and Earth Fault protection with extended rotary handle - 1 No..</p> <p>Busbar                      1 Set of 600 A TPN busbars of high conductivity electrolytic quality Aluminium alloy and suitable size earthing conductor through out the panel for its earthing.</p> <p>Instruments                      2A, C curve SP MCB - 3 No..                      RYB indication lamp, LED type - 3 No..                      5 No 3 phase Digital Multi function M to read V, A, F, kW, kWh, Acc class 1.                      400/5A 5VA class -0.5 resin cast CT - 3No.                      100/5A 5VA class 1 resin cast CT - 12No.</p> <p>Outgoing.                      32A 4Pole MCB 10kA,C Curve -8 No.                      40A 4Pole MCB 10kA,C Curve -9 No.                      63A 4Pole MCB 10kA,C Curve - 5 No.                      63A 4Pole MCCB 16kA,C Curve - 7 No.</p>	1	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
314	<p>Supply, Installation, Testing &amp; Commissioning of MDB Panel-2 (Right side- Lighting, Power &amp;AHU) , cubicle type, made out of min 2mm thick CRCA sheet (load bearing), totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system, including internal wiring with suitable size wires, rotary handle, spreaders, 3mm thick gland plate, hinged type door with neoprene / PU gasket etc. The panel shall include supply &amp; installation of following switchgears, Ming instruments and accessories as per specification.</p> <p>Incomer 400 A TPN 35kA MCCB with Microprocess release with adjustable inbuilt Over Load, Short Circuit and Earth Eault protection with extended rotary handle - 1 No. Busbar 1 Set of 600 A TPN busbars of high conductivity electrolytic quality Aluminium alloy and suitable size earthing conductor through out the panel for its earthing. Instruments 2A, C curve SP MCB - 3 No.. RYB indication lamp, LED type - 3 No.. 4 No 3 phase Digital Multi function M to read V, A, F, kW, kWh, Acc class 1. 400/5A 5VA class -0.5 resin cast CT - 3No. 100/5A 5VA class 1 resin cast CT - 9No. Outgoing. 32A 4Pole MCB 10kA,C Curve -6 No. 40A 4Pole MCB 10kA,C Curve -7 No. 63A 4Pole MCB 10kA,C Curve - 5 No.</p>	1	No.		
315	<p>Supply, Installation, Testing &amp; Commissioning of MDB Panel-U1 (Left &amp; Right side- UPS ) , cubicle type, made out of min 2mm thick CRCA sheet (load bearing), totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system, including internal wiring with suitable size wires, rotary handle, spreaders, 3mm thick gland plate, hinged type door with neoprene / PU gasket etc. The panel shall include supply &amp; installation of following switchgears, Ming instruments and accessories as per specification.</p> <p>Incomer                      100 A 4Pole 16kA MCCB with Thermal release with adjustable inbuilt Over Load and Short Circuit protection with extended rotary handle - 2 No..                      Busbar                      1 Set of 150 A 4 Pole busbars of high conductivity electrolytic quality Copper alloy and suitable size earthing conductor through out the panel for its earthing.                      Instruments                      2A, C curve SP MCB - 3 No..                      RYB indication lamp, LED type - 6 No..                      100/5A 5VA class 1 resin cast CT - 3No.                      Outgoing.                      40A DP MCB 10kA,C Curve -9 No.</p>	1	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
316	<b>DISTRIBUTION BOARDS:</b> Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator) 12 way, Double door	6	No.		
317	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/ Isolator) 8 way (4 + 24), Double door	11	No.		
318	Supplying and fixing following rating, four pole, 415 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required. 40 A	6	No.		
319	63 A	6	No.		
320	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required. Single pole	258	No.		
321	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	18	No.		
322	Supplying and fixing following rating, double pole, 240 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required. 63 A	1	No.		
323	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required. 40 A	24	No.		
324	63 A	18	No.		
325	<b>SUPPLY &amp; LAYING OF LT CABLE , CABLE TRAYS &amp; JUNCTION BOXES:</b> Supply of XLPE insulated and PVC sheathed Aluminium conductor armoured cable of 1.1 KV grade conforming to IS : 7098:1988 with upto date amendments of following sizes 3.5 core, 185 Sq.mm.	100	M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
326	Supply of XLPE insulated and PVC sheathed copper conductor armoured cable of 1.1 KV grade confirming to IS : 7098:1988 with upto date amendments of following sizes 4 core, 16 Sq.mm.	310	M		
327	4 core, 10 Sq.mm.	375	M		
328	4 core, 6 Sq.mm.	275	M		
329	3 core, 6 Sq.mm.	210	M		
330	Laying and fixing of following sizes of one number PVC insulated and PVC sheathed/XLPE Power cable of 1.1kv grade on cable tray as required. Upto 35 sq. mm (clamped with 1mm thick saddle)	1170	M		
331	Above 95 sq. mm and upto 185 sq. mm (clamped with 25/40x3mm MS flat clamp)	100	M		
332	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required. 3.5 core, 185 Sq.mm.	4	Sets		
333	Supplying and making end termination with brass double compression gland and copper lugs for following size of PVC insulated and PVC sheathed / XLPE copper conductor cable of 1.1 KV grade as required. 4 core, 16 Sq.mm.	14	No.		
334	4 core, 10 Sq.mm.	30	No.		
335	4 core, 6 Sq.mm.	22	No.		
336	3 core, 6 Sq.mm.	12	No.		
337	Supplying and installing following size of perforated pre-painted GI cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with 8mm GI suspenders including bolts & nuts, painting suspenders etc as required. 150 mm width x 50mm depth x 1.6 mm thickness.	600	M		
338	225 mm width x 50mm depth x 1.6 mm thickness.	400	M		
339	300 mm width x 50mm depth x 1.6 mm thickness.	100	M		
340	Providing,fixing and laying of following dia GI Pipe medium class in ground with GI fitting including trenching 75cm deep and re-filling as required. 50 mm dia	10	M		
341	<b>EARTHING</b> : Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	4	Set		
342	Supplying and laying 6 SWG G.I. wire at 0.50 metre below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	2200	M		
343	Providing and fixing 25 mm X 5 mm G.I. strip on		M		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
	surface or in recess for connections etc. as required.	300			
344	INTELLIGENT ADDRESSABLE FIRE DETECTION & ALARM SYSTEM: FIRE ALARM PANELS Supply, installation, testing and commissioning of 2 Loop Microprocessor based intelligent analogue addressable, modular, expandable networkable, following loop (No. loop consist of minimum 99detector & 99devices) fire alarm control panel with minimum 640 character LCD display, multiple access levels, event history file in non-volatile memory (EEPROM).The panel shall support programmable relay for controlling lifts, staircase pressurizations fans, lift shaft & lift lobby pressurization fans, toilets exhaust fans, ventilation fans, monitoring of fire sprinkler and fire hydrant pump controlled by powerful Boolean logic equation. The panel shall have minimum five independent hazard release circuit built-in the panel.the panel shall have interface facility with Public Addressing system . The panel shall have 240 volts AC power supply, automatic battery charger, 24 volts, sealed lead acid maintenance free batteries sufficient for 24 hours normal working and then be capable of operating the system for 4 hours during emergency condition. The panel shall be UL/EN listed. Tenderer to provide interfacing connectivity (BAC Net/modbus gateway) in Fire Panel for integrating with building management system complete as per specification	1	Set		
345	Supply, Testing & Commissioning, fixing of Network Repeater Panel with 6 inch or 640 characters LCD Panel ; The LCD shall Display all events / detectors, devices status of complete systems in the networked, The NRP shall be equipped with QWERTY Keypad. Mounting options include an annunciator box, and blank modules are required for mounting.	1	No.		
346	Supply, Testing & Commissioning, fixing of Analog addressable Multicriteria detector with mounting based LED, address switch to programme the detectors complete as required.	107	No.		
347	Supply, Testing & Commissioning, fixing of Fault Isolators for isolating shorted, dewired and loose circuits between two successive fault isolators with automatic resetting arrangement complete as required.	12	No.		
348	Supply, Testing & Commissioning, fixing of Addressable relay control modules etc complete as required as per specifications.	12	No.		
349	Supply, Testing & Commissioning, fixing of Addressable monitor modules for Sprinkler Flow Switch, Fire doors, magnetic contacts complete as required as per specifications.	2	No.		
350	Supply, Testing & Commissioning, fixing of Addressable Glass Break type Manual Call Points as required as per specifications.	10	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
351	Supply, Testing & Commissioning, fixing of Addressable Hooter with Strobe lights with 110 cd. Strobes shall be synchronised for better evacuation as per specification complete as required.	10	No.		
352	Supply, Testing & Commissioning, fixing of LED based Respons Indicator with flat cover plate as approved by consultant/Architect.	6			
353	<b>CONDUITING AND CABLING PUBLIC ADDRESS SYSTEM:</b> Supply, laying and connecting of single pair PVC insulated FRLS twisted shielded copper conductor cable of 32/0.2 mm dia in existing conduit including all fixing accessories as required.	1232	M		
354	Supply, installation, testing and commissioning of False Ceiling Speakers of 6 W RMS power with multitaps, handling capacity, inbuilt 100 V Line Matching Transformer, Wide Opening angle, Optimized for music and speech applications, complete with mounting clamps.	71	No.		
355	Supply, installation, testing and commissioning of Wall Mounted Cabinet Speakers of 15 W RMS power, with multitaps, handling capacity, inbuilt 100 V Line Matching Transformer, Internal Tappings, Trapezoidal Compact Design, Optimized for speech and music applications	6	No.		
356	Supply, installation, testing and commissioning of (BOSCH /ATIES) of rack mounted dual Channel Power Amplifier capable of delivering 300 W RMS power output or 480 W RMS burst output; complete with 100 V Line Matching Transformer, built-in fan for temperature control, Distortion typically 0.03% @ 1 KHz, Hum and Noise 90 dB below rated output selection facility, provision for hookup with Fire Alarm Panel, complete with connections and required circuitry	2	No.		
357	Supply, installation, testing and commissioning of followings with communication cable and accessories as required for system. Voice Controller as required for system. suitable Zone selector with micro phone including keypad as required for system. Router as required for system. System compressive of above as required	1	Lot		
358	Supply, installation, testing and commissioning of micro phone for remote location and interface with controller including communication cable and all accessories.	6	No.		
359	Supply, installation, testing and commissioning of 19" equipment rack made out of 2 mm thick CRCA sheet duly powder coated; in-built amplifier mounting; amplifier, controller, suitable for housing of above control equipment.	1	No.		

S.No.	Item Description	Qty	Unit	Rate (In INR)	Amount (In INR)
360	CCTV (IP VIDEO SURVEILLANCE) SYSTEM : Supply, installation, testing and commissioning of indoor Fixed dome with discreet and tamper-resistant casing. Varifocal 2.8-10 mm lens with fixed iris. Multiple, individually configurable H.264 and Motion JPEG streams; max HDTV 720p or 1 MP resolution at 30 fps. Video motion detection and active tampering alaM Power over Ethernet. Midspan not included.The camera shall have sound in facility.	19	No.		
361	Supply, installation, testing and commissioning of Pan/tilt dome with discreet and tamper-resistant casing. Varifocal 2.8-10 mm lens with fixed iris. Multiple, individually configurable H.264 and Motion JPEG streams; max HDTV 720p or 1 MP resolution at 30 fps. Video motion detection and active tampering alaM Power over Ethernet.Midspan not included.The camera shall have sound in facility.	23	No.		
362	Supply, installation, testing and commissioning of 30 channel NVR with two video outputs & 32" totally flat colour LCD monitor and joy stick as per Specification. Contractor shall size the NVR for real time 400 FPS / 4 CIF resolution 30 days of continous recording and submit data sheet of their storage calculation for both MPEG 4 and H.264 recording formats. The NVR with IP connectivity, DVD R/W & USB connectivity with all necessary softwarealong with standalone UPS with 15 min. Battery back.	2	No.		
363	Supply, installation, testing and commissioning of user Client control software (web based) complete as per spec with valid licenses. The software should enable the user to view multiple cameras in any combination available on the network .	1	Set		
364	UPS SYSTEM : 1 No.20 KVA 3 phase input (415 V + 15%), three phase output (415 V + 1%) in Stand alone mode with isolation transformer with 30 minutes battery backup No. complete with battery rack & inter connector for batteries & Isulation switch for No. bank battery.	1	No.		

## **Appendix B – Form of Bank Guarantee**

### **Annexure I – Performance Security**

Employer.....,  
Gandhinagar, Gujarat

WHEREAS:

\_\_\_\_\_ [name and address of Contractor] (hereinafter called “the Contractor”) and [name and address of the EMPLOYER], (“the EMPLOYER”) have entered into an agreement (the “Agreement”) for “[Name of the work]\_”

- (A) [Name of the work], subject to and in accordance with the provisions of the Agreement.
- (B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the Construction Period and Defects Liability Period (as defined in the Agreement) in a sum of Rs. .... Crore (Rupees .... Crore) (the “Guarantee Amount”).
- (C) We, .....through our branch at ..... (the “Bank”) have agreed to furnish this bank guarantee (hereinafter called the “Guarantee”) by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor’s obligations during and under and in accordance with the Agreement, and agrees and undertakes to pay to the Employer, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the guarantee amount as the EMPLOYER shall claim, without the EMPLOYER being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the EMPLOYER, under the hand of an officer not below the rank of [.....of EMPLOYER], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the EMPLOYER shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the EMPLOYER and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the EMPLOYER shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the EMPLOYER to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The EMPLOYER shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfillment and/or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the EMPLOYER against the Contractor,

and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the EMPLOYER, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the EMPLOYER of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the EMPLOYER or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the EMPLOYER in respect of or relating to the Agreement or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.
7. Notwithstanding anything contained herein before, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the EMPLOYER on the Bank under this Guarantee all rights of the EMPLOYER under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Performance Security shall cease to be in force and effect 60 (sixty) days after the end of the Defects Liability Period as set forth in Clauses 1.1
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the EMPLOYER in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the EMPLOYER that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the end \*\*\*\* month in the year \*\*\*\*\* or until it is released earlier by the EMPLOYER pursuant to the provisions of the Agreement.

Signed and sealed this ..... day of ..... 20..... at .....

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

**Annexure II – Form for Guarantee for Advance Payment**

.....,

.....EMPLOYER,

Gandhinagar, Gujarat

**WHEREAS:**

[name and address of Contractor] (hereinafter called “the Contractor”) has executed an agreement (hereinafter called the “Agreement”) with the [name and address of the EMPLOYER], (hereinafter called “the EMPLOYER”) for the “[Name of the work], subject to and in accordance with the provisions of the Agreement.

(A) in accordance with the Clause 1.64 of the Agreement the EMPLOYER shall make to the Contractor an interest bearing advance payment (hereinafter called “Advance Payment”) equal to 10% (ten per cent) of the contract price for mobilization expenses and acquisition of equipment; and that the Advance Payment shall be made in subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equal to the 110% amount of each instalment to remain effective till the complete and full repayment of the instalment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement; and the amount of instalment of the Advance Payment is Rs. \*\*\*\* cr. (Rupees \*\*\*\*\* crore) (the “Guarantee Amount”).

(B) We, .....through our branch at ..... (the “Bank”) have agreed to furnish this bank guarantee (hereinafter called the “Guarantee”) for the Guarantee Amount.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the EMPLOYER, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the guarantee amount as the EMPLOYER shall claim, without the EMPLOYER being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the EMPLOYER, under the hand of an officer not below the rank of [.....of EMPLOYER], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the installment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the EMPLOYER shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the EMPLOYER and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the EMPLOYER shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the EMPLOYER to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The EMPLOYER shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the EMPLOYER against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the EMPLOYER, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the EMPLOYER of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the EMPLOYER or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the EMPLOYER in respect of or relating to the Advance Payment.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the EMPLOYER on the Bank under this Guarantee all rights of the EMPLOYER under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The guarantee shall cease to be in force and effect 90 (ninety) days after the end of the one year from the date of payment of the installment of the Advance Payment, as set forth in Clause 19.2 of the Agreement.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the EMPLOYER in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the EMPLOYER that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the end \*\*\*\* month in the year \*\*\*\*\* or until it is released earlier by the EMPLOYER pursuant to the provisions of the Agreement.

Signed and sealed this ..... day of ..... 20..... at .....

**SIGNED, SEALED AND DELIVERED**

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

## **Section 3. Scope of Work and Technical Specifications**

### **A. Scope of Work**

- (i) Introduction**
- (ii) Salient Features**
- (iii) Scope of Work**

**(i) Introduction**

The Dholera Special Investment Region (DSIR) is envisaged to be a world class destination with efficient infrastructure, offering opportunities for setting up of manufacturing units which will help in increasing the industrial output of the country and create jobs (800,000+) besides providing an environment for work, live, learn and play. DSIR is a planned smart, sustainable community which will be the role model for future cities in India.

**(ii) Salient Features**

- The Building is G+2 floors and divided into two blocks, left hand side a double height auditorium and a multipurpose hall (Banquet cum three Conference halls) and right hand side is Exhibition halls on all three floors (Ground Floor is permanent exhibition, First & Second floor are temporary exhibition).
- Auditorium capacity is 219 nos. with spacious and comfortable seats where almost 50 seats are accessible through the ramps for disabled. The built up area of this space is approx. 845 sq.m The Auditorium is proposed with high-tech audio visual system, effective use of acoustic materials. The auditorium also includes double height Pre-function to gather people for the tea/snack breaks. The stage is proposed in rich wood and LED screens are mounted on it so that presenter can see the content while addressing/presenting to the people. The stage is connected with two green rooms, toilet and a lounge for backstage activities and facilities.
- Permanent Exhibition space is proposed for the demonstration on Evolution of Dholera SIR through vision walls, continuous shows through world-class projection mapping technology on the activation area model on the scale of 1:500. The built-up area of this space on ground floor is approx. 700 sq.m.
- Temporary Exhibition spaces are very flexible in design so that different types of stalls/kiosks can be installed as required by the purpose of it. The built-up area of this on first floor is 773 sq.m and on second floor is 635 sq.m.
- Multipurpose Hall is design in a manner that the space can be converted into banquet hall capacity of 240 nos. and three big conference rooms 80 nos. capacity each. There are provisions of sliding walls which are collapsible and stored in the closed cabinet as per the requirement. Furniture is also designed in a manner that the same chairs and tables can be used for banquet as well as conference by attaching and detaching with each other. Three big LED screens are also proposed to serve both the purposes. The built-up area of the space is 783 sq.m.

**(iii) Scope of Work**

An Administrative and Business Center for Dholera (ABCD) building complex in TP2 West has been envisaged for the City/Node SPV to administer and oversee the development works for the DSIR. The development is planned in phased manner, first phase is envisaged to house administrative functions, for that SPV building has been designed, along with auditorium and Business and Exhibition center. The construction contract for both buildings (SPV + BEC) ABCD phase-I were awarded to the contractor where the Interior scope area will be handed over to Interior Contractor as core and shell. Business and Exhibition Centre (BEC) building is proposed to be completed first before SPV building.

The project vision is to create a state-of-the-art BEC (Business & Exhibition Centre) Building which is proposed for Public related activities like Auditorium, Exhibition Spaces (Permanent Exhibition space which shows Vision of the Dholera SIR as well as the space where temporary stalls, kiosks, events can be organised), Multipurpose hall which can be used as Banquet Hall as well as converted into 3 big conference rooms as per the requirements.

The scope in brief is to commission the facilities in the given timelines in coordination with existing EPC contractor of ABCD Building. The Interior contractor shall take the inputs from the building services from the equipment installed by the EPC contractor on HVAC & Electrical load and to install any new equipment if required in the designated areas. The Interior contractor is responsible to commission all the building services on the date of commissioning.

The Interior Contractor shall take up but not limited to do

- All types of civil works including minor civil opening correction in the existing walls, minor RRC/PCC works, pest control, all type of flooring, plastering, water proofing, toilet dado, toilet fixtures, fittings & accessories, fabrication work for steps in auditorium and stage, fixing up the doors and windows, wall punning, wall putty, and all types of interior painting and polishing.
- All types of Interior Furnishing works including floor carpeting, wooden flooring, wall panelling, acoustic & insulation treatments, different types of false ceilings, all types of glass works, all types of onsite carpentry works with the laminates, desired polish or paint as required, curtains and blinds, SS railing, false flooring in AV room, high quality operable sliding wall partitions in the banquet hall, all types of sofas, chairs, tables and other misc. furniture, wall paintings, artefacts, dustbins, planter cases, TV units, magazine racks, all types of floor mats, 2D/3D wallpapers etc.
- HVAC work from the AHUs and other equipment provided by EPC contractor, the interior contractor shall take the inputs from the equipment and supply the output to the indoor units through chilled water pipes, supply air ducts, return air ducts, fire dampers, the contractor to provide a separate VRV system with all the indoor and outdoor units and pipes for the banquet hall on the second floor above auditorium.
- Electrical Works taking the inputs from the existing electrical room installed by the existing EPC contractor or installation of new items if required by the consultant. The contractor shall also pull the cables from the source to the output on the proposed cable ladders, raceways, conduit pipes (concealed and open) to the final output to lighting fixtures, power sockets, mcb/mdb panels.
- Extra Low Voltage systems taking the inputs from the existing source pulling all cables through on raceway, cable ladder or conduits whatever shown in the drawings to Audio visual, Data & Voice, CCTV Surveillance and controls, public address, fire alarm, special AV requirement in auditorium and permanent exhibition area. UPS and equipment to be installed if required by the consultant.
- Plumbing work is required in one toilet attached with the green rooms and lounge at the back of the stage including drainage, sewage, water supply, fixtures and fittings etc.
- Firefighting work in the whole scope area using the same Fire Hydrant Shafts which are in existing EPC Contractor scope for sprinklers etc.
- Use energy efficient materials as per BOQ-Specifications & hire green building consultant for getting Latest Green Building Certification (IGBC Green Interior rating System for New & Existing Interior fitouts) for Gold or above rating.

## **B. Technical Specifications**

- (i) Technical Specifications for Electrical, LV & Security Systems**
- (ii) Technical Specifications for HVAC Systems**
- (iii) Technical Specifications for Plumbing & Firefighting Systems**
- (iv) Technical Specifications of Audio Visual Systems**
- (v) Technical Specifications of Civil & Interior items**

(i) **Technical Specification for Electrical, LV & Security SYSTEMS**

**SPECIAL CONDITIONS**

**1. GENERAL**

These special conditions are intended to amplify the General Conditions of Contract, and shall be read in conjunction with the same. For any discrepancies between the General Conditions and these Special Conditions, the more stringent shall apply.

**2. SCOPE OF WORK**

The general character and the scope of work to be carried out under this contract is illustrated in Drawings, Specifications and Schedule of Quantities. The Contractor shall carry out and complete the said work under this contract in every respect in conformity with the contract documents and with the direction of and to the satisfaction of the Owner's site representative. The contractor shall furnish all labour, materials and equipment (except those to be supplied by the owner) as listed under Schedule of Quantities and specified otherwise, transportation and incidental necessary for supply, installation, testing and commissioning of the complete electrical system as described in the Specifications and as shown on the drawings. This also includes any material, equipment, appliances and incidental work not specifically mentioned herein or noted on the Drawings/Documents as being furnished or installed, but which are necessary and customary to be performed under this contract. The electrical system shall comprise of the following:

- a. All conduit work including junction boxes, outlet boxes and wiring for lighting and power circuit.
- b. Switches, plug sockets, cover plates and other wiring accessories.
- c. LT Cables, Mains and Sub-Mains.
- d. GI raceways and junction boxes.
- e. Distribution panels & Final Distribution panels.
- f. Cables on cable trays and / or within suspended ceiling spaces including installation, cable trays, hangers, supports, cable terminations and all fixing accessories.
- g. Earthing (Grounding) System.
- h. Supply and installation of Lighting Fixtures
- i. Supply and installation of Voice & Data Network.
- j. Supply and installation of for PA System
- k. Supply and installation of FAS and Security System
- m. Testing and commissioning.

### **3. ASSOCIATED CIVIL WORKS**

Following civil works associated with Electrical installation are excluded from the scope of this contract except for all minor civil work like wall chasing by wall chaser, making holes etc. for installation of conduits/cables and making good. These shall be executed by other agencies in accordance with approved shop drawings of, and under direct supervision of the electrical contractor.

- a. PCC foundation blocks with angle iron frame work edging for all power control centres and motor control centres.
- b. Repair of all disturbed surfaces/openings made by Electrical Contractor.

### **4. PROJECT EXECUTION AND MANAGEMENT**

The Contractor shall ensure that senior planning and erection personnel from his organization are assigned exclusively for this project. The Contractor shall appoint one Project Engineer holding senior management position in the organization. He shall be assisted on full time basis by a minimum of two senior supervisors. The entire staff shall be posted at site on full time basis. Separate ID card to be given by the Contractor to each worker working on site.

The project management shall be through modern technique. The Contractor's office at site shall be fully equipped with fax, computers & plotter and shall prepare proper bar chart and completion schedules to be submitted & ensure timely completion. Erection engineer and supervisors shall be provided with mobile communication system so that they can always be reached.

For quality control & monitoring of workmanship, contractor shall assign at least one full-time engineer who would be exclusively responsible for ensuring strict quality control, adherence to specifications and ensuring top class workmanship for the electrical installation. Contractor shall furnish details of licenses of supervisors/workmen to be employed at site.

### **5. PERFORMANCE GUARANTEE**

The contractor shall carry out the work in accordance with the Drawings, Specifications, Schedule of Quantities and other documents forming part of the Contract.

The contractor shall be fully responsible for the performance of the selected equipment (installed by him) at the specified parameters and for the efficiency of the installation to deliver the required end result.

The contractor shall guarantee that the Electrical system as installed shall perform to complete satisfaction of the owner. The guarantee shall be submitted in the proforma given in Appendix - II.

Complete set of architectural drawings is available in the Architect/Consultant's office and reference may be made to same for any details or information. The contractor shall also guarantee that the performance of various equipment individually, shall not be less than the quoted capacity; also actual power consumption shall not exceed the quoted rating, during testing and commissioning, handing over and guarantee period.

At the close of the work and before issue of final certificate of virtual complete on, the contractor shall furnish written performance guarantee against defective materials and workmanship for a period of one year from date of testing, commissioning and handing over. The guarantee shall be submitted in proforma given in Appendix-II. The Contractor shall hold himself fully responsible for reinstallation or replacement, free of cost to Owner the following:

- a. Any defective work or material supplied by the Contractor.

- b. Any material or equipment damaged or destroyed as a result of defective workmanship by the Contractor.

**6. BYE-LAWS AND REGULATIONS**

The work shall be carried out to the satisfaction of the Owner's site representative and in accordance with the Specifications, Regulations of the Electric Supply Authority, Indian Electricity Rules and Regulations, latest Indian Standards and as per the requirements of the Chief Fire Officer.

**7. FEES AND PERMITS**

The Contractor shall pay any and all fees and obtain permits apply & get load sanction as required for the installation of this work. On completion of the work, the contractor shall obtain and deliver to the Owner, certificate of final inspection and approval by the local electricity authority (CFO/ Municipal, State/Central govt. whichever is applicable)

**8. DRAWINGS**

The Electrical Drawings listed under Appendix-I, which may be issued with tenders, are diagrammatic only and indicate arrangement of various systems and the extent of work covered in the contract. These Drawings indicate the points of supply and of termination of services and broadly suggest the routes to be followed. Under no circumstances shall dimensions be scaled from these Drawings. The architectural/interiors drawings and details shall be examined for exact location of equipment, electrical points & fixtures.

The contractor shall follow the tender drawings in preparation of his shop drawings, and for subsequent installation work. He shall check the drawings of other trades to verify spaces in which his work will be installed.

Maximum headroom and space conditions shall be maintained at all points. Where headroom appears inadequate, the contractor shall notify the Architect/Consultant/Owner's site representative before proceeding with the installation. In case installation is carried out without notifying, the work shall be rejected and contractor shall rectify the same at his own cost.

The contractor shall examine all architectural, structural, plumbing, HVAC and other services drawings and check the as-built works before starting the work and report to the Owner's site representative any discrepancies and obtain clarification. Any changes found essential to coordinate installation of his work with other services and trades, shall be made with prior approval of the Architect/Consultant/Owner's site representative without additional cost to the Owner.

**9. SPECIFICATIONS**

The Specifications shall be considered as part of this contract. The Drawings indicate the extent and general arrangement of power distribution, location of lighting fixtures, controlling switches, wiring system, cabling and earthing. These drawings are essentially diagrammatic. The Drawings indicate the point of termination of conduit runs and broadly suggest the routes to be followed. The work shall be installed as indicated on the Drawings. However, any change found essential to coordinate the installation of this work with other trades shall be made without any additional cost to the Owner. The data given herein and on the Drawings is as exact as could be secured, but its complete accuracy is not guaranteed. The drawings are for the guidance of the contractor, exact locations, distances and levels shall be governed by the site conditions and the Architectural & Interior layouts.

## 10. SHOP DRAWINGS

10.1 All the shop drawings shall be prepared on computer through AutoCAD System based on Architectural Drawings, site measurements and Interior Designer's Drawings. Within four weeks of the award of the contract, contractor shall furnish, for the approval of the Architect/Consultant, two Set of detailed shop drawings of all equipment and materials including layouts for all conduit layouts, distribution panels, switch boards, cabinets, special pull boxes, cable trays and any other requirement to be fabricated or purchased by the contractor.

10.2 These shop drawings shall contain all information required to complete the Project as per specifications and as required by the Architect/Consultant/Owner's site representative. These Drawings shall contain details of construction, size, arrangement, operating clearances, performance characteristics and capacity of all items of equipment, also the details of all related items of work by other contractors. Each shop drawing shall contain tabulation of all measurable items of equipment/materials/works and progressive cumulative totals from other related drawings to arrive at a variation-in-quantity statement at the completion of all shop drawings.

Each item of equipment/material proposed shall be a standard catalogue product of an established manufacturer strictly from the manufacturers listed in Appendix-III.

When the Architect/Consultant makes any amendments in the above drawings, the contractor shall supply two fresh Set of drawings with the amendments duly incorporated along with check print, for approval. The contractor shall submit further six Set of shop drawings to the Owner's site representative for the exclusive use by the Owner's site representative and all other agencies. No material or equipment may be delivered or installed at the job site until the contractor has in his possession, the approved shop drawing for the particular material/equipment/installation.

10.3 Shop drawings shall be submitted for approval sufficiently in advance of planned delivery and installation of any material to allow Architect/Consultant ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved programme.

10.4 Manufacturers drawings, catalogues, pamphlets and other documents submitted for approval shall be in four Set. Each item in each set shall be properly labeled, indicating the specific services for which material or equipment is to be used, giving reference to the governing section and clause number and clearly identifying in ink the items and the operating characteristics. Data of general nature shall not be accepted.

10.5 Samples of all materials like conduits, accessories, switches, wires, control cables etc shall be submitted to the Owner's site representative prior to procurement. These shall be submitted in two Set for approval and retention by Owner's site representative and shall be kept in their site office for reference and verification till the completion of the Project.

01.6 Approval of shop drawings shall not be considered as a guarantee of measurements or of building dimensions. Where drawings are approved, said approval does not mean that the drawings supersede the contract requirements, nor does it in any way relieve the contractor of the responsibility or requirement to furnish material and perform work as required by the contract.

10.7 Where the contractor proposes to use an item of equipment, other than that specified or detailed on the drawings, which requires any redesign of the structure, partitions, foundation, wiring or any other part of the mechanical, electrical or architectural layouts; all such re-design, and all new drawings and detailing required therefore, shall be prepared by the contractor at his own expense and gotten approved by the Architect/Consultant/ Owner's site representative.

10.8 The contractor shall extend full cooperation to HVAC contractor in preparation of his coordinated services drawings. He shall issue floppies and hard prints of his shop drawings to HVAC contractor well in advance to complete the coordinated services drawings in accordance with schedule prepared by the Owner site representatives. Where the work of the contractor has to be installed in close proximity

to, or will interfere with work of other trades, he shall assist in working out space conditions to make a satisfactory adjustment. If so directed by the Owner's site representative, the contractor shall prepare composite working drawings and sections at a suitable scale, not less than 1:50, clearly showing how his work is to be installed in relation to the work of other trades. If the Contractor installs his work before coordinating with other trades, or so as to cause any interference with work of other trades, he shall make all the necessary changes without extra cost to the Owner.

- 10.9 Within two weeks of approval of all the relevant shop drawings, the contractor shall submit four copies of a comprehensive variation in quantity statement, and itemized price list of recommended (by manufacturers) imported and local spare parts and tools, covering all equipment and materials in this contract. The Project Manager shall make recommendation to Owner for acceptance of anticipated variation in contract amounts and also advise Owner to initiate action for procurement of spare parts and tools at the completion of project.

## **11. ACCESSIBILITY**

The Contractor shall verify the sufficiency of the size of the shaft openings, clearances in wall cavities and suspended ceilings for proper installation of his conduits cables, cable trays, panels etc.. His failure to communicate insufficiency of any of the above, shall constitute his acceptance of sufficiency of the same. The Contractor shall locate all equipment which must be serviced, operated or maintained in fully accessible positions. The exact location and size of all access panels, required for each concealed control damper, valve or other devices requiring attendance, shall be finalized and communicated in sufficient time, to be provided in the normal course of work. Failing this, the Contractor shall make all the necessary repairs and changes at his own expense. Access panel shall be standardized for each piece of equipment / device / accessory and shall be clearly nomenclature / marked.

## **12. MATERIALS AND EQUIPMENT**

All materials and equipment shall conform to the relevant Indian Standards and shall be of the approved make and design. Makes shall be strictly in conformity with list of approved manufacturers as per Appendix - III.

The Contractor shall be responsible for the safe custody of all materials and shall insure them against theft or damage in handling or storage etc. A list of items of materials and equipment, together with a sample of each shall be submitted to the Owner's site representative within 15 days of the award of the contract. Any item which is proposed as a substitute, the contractor shall state the credit, if any, due to the Owner in the event the substitution is approved. All changes and substitutions shall be requested in writing and approvals obtained in writing from the Owner's site representative.

## **13. MANUFACTURERS INSTRUCTIONS**

Where manufacturer has furnished specific instructions, relating to the material and equipment used in this project, covering points not specifically mentioned in these documents, manufacturer's instructions shall be followed in that case.

## **14. COMPLETION CERTIFICATE**

On completion of the electrical installation a certificate shall be furnished by the Contractor countersigned by the licensed supervisor, under whose direct supervision the installation was carried

out. This certificate shall be in the prescribed form as required by the local, state/central govt./municipal / fire authorities concerned.

#### **15. INSPECTION AND TESTING**

The Owner may carry out inspection and testing at manufacturer's works for this contract. No equipment shall be delivered without prior written confirmation from the Owner's site Engineer. In case factory inspection is carried out then all travelling and lodging expenses for two persons one from owner and one from consultants shall be borne by the Contractor, also all expenses related to testing shall be to Contractor account. Tests on site of completed works shall demonstrate the following:

That the equipment installed complies with specification in all respect and is of the correct rating for the duty and site conditions.

That all items operate efficiently and quietly to meet the specified requirements.

That all circuits are fully protected and that protective devices are properly co-ordinated.

That all non-current carrying metal parts are properly and safely grounded in accordance with the specification and appropriate Codes of Practice.

The contractor shall provide all necessary instruments and labour for testing, shall make adequate records of test procedures and readings, shall repeat any tests requested by the Owner and shall provide test certificate signed by a authorized person. Such test shall be conducted on all materials and equipment and tests on completed work as called for by the Owner at contractor's expenses unless otherwise called for.

If it is proved that the installation or part thereof is not satisfactorily carried out then the contractor shall be liable for the rectification of the same. Owner Site Engineer's decision as to what constitutes a satisfactory installation shall be final.

All tests shall be carried out by a test house approved by the Owner / Consultants.

#### **16. COMPLETION DRAWINGS**

Upon completion of the work and before issuance of certificate of virtual completion the contractor shall submit to the Owner's site representative four Set of layout drawings in progressive manner for individual systems drawn at approved scale indicating the complete wiring system as installed. Drawings shall be prepared on AUTO-CAD (latest version). Along with the hard copies, the contractor shall submit copies of all drawings on CD and one set of all drawings on RTF shall also be submitted. These drawings must provide:

- a. Single line power distribution diagram including control wiring.
- b. Cable Trays with number and size of cables installed.
- c. Run and size of conduits, inspection, junction and pull boxes.
- d. Raceways and Junction Boxes.
- e. Number and size of conductors in each conduit with phase identification.
- f. Location and rating of sockets and switches controlling the lighting and power outlets.
- g. Location and details of distribution boards/panels, mains, switches along with phase balancing details.

- h. A complete wiring diagram as installed and single line diagrams showing all connections in the complete electrical system.
- i. Location of all earthing stations, route and size of all earthing conductors manhole.
- k. Layout and particulars of all LT cables.
- l. Instruction, maintenance and operation manuals including maintenance schedule for all equipment. Testing & commissioning reports of all electrical equipment.

**17. OPERATING INSTRUCTION & MAINTENANCE MANUAL**

Upon completion and commissioning of part Electrical system the contractor shall submit a draft copy of comprehensive operating instructions, maintenance schedule and log sheets for all systems and equipment included in this contract. This shall be supplementary to manufacturer's operating and maintenance manuals. Upon approval of the draft, the contractor shall submit four (4) complete bound Set of typewritten operating instructions and maintenance manuals; one each for retention by Consultant and Owner's site representative and two for Owners Operating Personnel. These manuals shall also include basis of design, detailed technical data for each piece of equipment as installed, spare parts manual and recommended spares for 4 year period of maintenance of each equipment.

**18. ON SITE TRAINING**

Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labour and helpers for operating the entire installation for a period of thirty (30) working days of ten (10) hours each, to enable the Owner's staff to get acquainted with the operation of the system. During this period, the contractor shall train the Owner's personnel in the operation, adjustment and maintenance of all equipment installed.

**19. MAINTENANCE DURING DEFECTS LIABILITY PERIOD**

19.1 Complaints

The Contractor shall receive calls for any and all problems experienced in the operation of the system under this contract, attend to these within 10 hours of receiving the complaints and shall take steps to immediately correct any deficiencies that may exist.

19.2 Repairs

All equipment that require repairing shall be immediately serviced and repaired. Since the period of Mechanical Maintenance runs concurrently with the defects liability period, all replacement parts and labour shall be supplied promptly free-of-charge to the Owner.

**20. UPTIME GUARANTEE**

The contractor shall guarantee for the installed system an uptime of 98%. In case of shortfall in any month during the defects liability period, the Defects Liability period shall get extended by a month for every month having shortfall. In case of shortfall beyond the defects liability period, the contract for Operation and Maintenance shall get extended by a month for every month having the shortfall and no reimbursement shall be made for the extended period.

The Contractor shall provide log in the form of diskettes and bound printed comprehensive log book containing tables for daily record of all temperatures, pressures, humidity, power consumption. starting

and stopping times for various equipment, daily services rendered for the system alarms, maintenance and record of unusual observations etc. Contractor shall also submit preventive maintenance schedule.

Each tenderer shall submit along with the tender, a detailed operation assistance proposal for the Owner's site representatives/Consultant's review. This shall include the type of service planned to be offered during Defects Liability Period and beyond. The operation assistance proposal shall give the details of the proposed monthly reports to the Management.

The tenderer shall include a list of other projects where such an Operation Assistance has been provided.

## **21. OPERATION AND MAINTENANCE**

Contractor may be required to carry out the operation of the Electrical installation for the defects liability period. Further, he may also be required to carry out operation and all inclusive maintenance of the entire system for a period of three years beyond the defects liability period.

### **21.1 Operation contract (Electrical System)**

- a. 10 hours a day, year round during working office hours for full load
- b. 14 hours a day, year round during non-work hours for part load.
- c. All stand-by equipment to be operated as per mutually agreed programme.
- d. Proper entry and upkeep of relevant log books.
- e. Maintain complaints register. Submit weekly report.
- f. Proper housekeeping of all areas under the contract.
- g. Prepare daily consumption report and summary of operation.

### **21.2 Terms of payment**

- i. Monthly at the end of each month on pro-rata basis.

### **21.3 All Inclusive Maintenance Contract**

#### **a. Scope**

The AMC shall cover all the items installed by the contractor including replacement of all switches, fittings etc. consumable like bulbs, tubes, oil etc. shall be excluded.

#### **b. Routine Preventive Maintenance Schedule to be submitted**

- i. Schedule to cover manufacturer's recommendation and/or common engineering practice (for all plant and machinery under contract).
- ii. Plant and machinery history card giving full details of equipment and frequency of checks and overhaul.
- iii. Monthly status report.
- iv. Entire Electrical installation to be repainted in fourth year (from commissioning) before the expiry of operation and maintenance contract.

- c. Uptime during maintenance contract
  - i. 98% uptime of all systems under contract.
  - ii. Up time shall be assessed every month and in case of shortfall during any month the contract shall be extended by a month.
  - iii. There shall be no reimbursement for the extended period.
  - iv. Break-downs shall be attended to within ten hours of reporting.
- d. Manpower
  - i. Adequate number of persons to the satisfaction of the Owner's site representative shall be provided including relievers.
  - ii. Statutory requirements of EPF, ESIC and other applicable labour legislations to be complied with; and monthly certification to that effect to be submitted.
  - iii. Duty allocation and Roaster control shall be contractor's responsibility.
  - iv. No overtime shall be payable by Owner for any reason whatsoever.
- e. Shut Downs
  - i. Routine shut downs shall be permitted only as allowed by the Chief Engineer.
  - ii. Contractor shall be at liberty to carry out routine maintenance as and when required but with prior permission of the Owner.
- f. Payment Terms
  - i. Quarterly payment at the beginning of each quarter on pro-rata basis.

## **22. METHOD OF MEASUREMENT**

The works shall be measured in accordance with relevant IS codes. Notwithstanding any general or local custom, except where otherwise specifically described or prescribed in the contract.

## **23. DEMONSTRATION TO OWNER**

At completion, devices subject to manual operation shall be operated atleast five times in presence of Owner's site representative to demonstrate satisfactory operation.

## **24. TOOLS AND TACKLES**

The Contractor shall provide and install all necessary hoists, ladders, scaffolding, tools, tackles, all transport for labour and materials and plant necessary for the proper execution and completion of the work to the satisfaction of the Owner's site representative.

**25. PARTIAL ORDERING**

Owner through the Architect/Consultant/ Owner's site representative reserves the right to order equipment and material from any and all alternates, and /or to order high side and /or low side equipment and materials or parts thereof from one or more tenderers.

**APPENDIX-I**

**LIST OF DRAWINGS**

<b>S. No</b>	<b>Drawing No.</b>	<b>Drawing Title</b>
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**APPENDIX-II**

**GUARANTEE FOR ELECTRICAL, LV & SECURITY SYSTEM INSTALLATION**

We here by guarantee the year round Electrical, LV & Security System which we have installed in the Complex described below:

Building : **COMMERCIAL BUILDING AT DHOLERA (BEC BUILDING)**

Location: **Dholera**

For a period of 12 months from the date of acceptance of the total installation, WE AGREE TO repair or replace to the satisfaction of the Owner, any or all such work that may prove defective in workmanship, equipment or materials within that period, ordinary wear and tear and unusual abuse or neglect excluded, together with any other work, which may be damaged or displaced in so doing. In the event of our failure to comply with the above mentioned conditions within a reasonable time, after being notified in writing, we collectively and separately, do hereby authorise the Owner to proceed to have the defects repaired and made good at our expense, and we shall pay the cost and charges thereof, immediately upon demand.

WE ALSO HEREBY UNDERTAKE to test the entire installation upon completion and ensure that all units are functioning satisfactorily.

**SIGNATURE OF CONTRACTOR**  
for ELECTRICAL, LV & SECURITY  
SYSTEM INSTALLATION

**DATE:**

**SEAL**

**APPENDIX – III**

**LIST OF APPROVED MAKES FOR EQUIPMENT & MATERIALS**

<b>S. No.</b>	<b>Details of Materials / Equipment</b>	<b>Manufacturer's Name</b>
<b>A. MEDIUM VOLTAGE EQUIPMENT</b>		
1.	Power Distribution Panel and Motor Control Centre	Shivalic Power control (P) Ltd. M/S GEM TECH. Application control Panel Pvt. Ltd. Electro Allied Products.
2.	Final Distribution Board	Schneider Electric L&T ABB Legrand Indoasian Etone
3.	Miniature Circuit Breakers (MCB)	Schneider Electric L&T ABB Legrand Indoasian Etone
4.	Residual Current Circuit Breaker (RCCB)	Schneider Electric L&T ABB Legrand Indoasian Etone
5.	Control Transformer/CT/Potential Transformers	Automatic Electric Gilbert & Maxwell Matrix Pragati Precise
6.	Indicating Lamps LED type and Push Button	Larsen & Toubro (ESBEE) Schneider Electric Siemens Teknik Vaishno Electricals
7.	Overload relays with built in Single Phase preventer	ABB Larsen & Toubro Schneider Electric Siemens
8.	Electronic Digital Meters (A/V/PF/Hz/KW/KWH) with LED Display	Enersole, trinity
9.	PVC insulated XLPE aluminium/copper conductor armoured MV Cables upto 1100V grade	Polycab, KEI Havells

10.	Cable Glands Single/Double Compression with earthing links	Baliga Lighting, Comet, Cosmos
11.	LT Jointing Kit / Termination	Birla-3M Raychem REPL Safe Kit
12.	PVC Glands	Control Well Lapp
13.	Bimetallic/AL Cable Lug	Comet Dowell's (Biller India) Hax Brass (Copper Alloy India)
14.	PVC insulated copper conductor stranded flexible wires (FRLS) -	KEI Skytone Batra Henlay
15.	PVC Conduit & Accessories (ISI approved)	AKG BEC Ravindra
16.	Switch & Socket	ABB- Lumina/Classic Clipsal (Opal Series) M K India -Wraparound / Blenze Legrand-Mosaic Wipro (North West) Philips
17.	Terminal Blocks	Connect Well Elmex Wago
18.	Industrial Socket	
	a. Splash Proof	Clipsal Gewiss Legrand Neptune Balls Schneider Electric
	b. Metal Clad	BCH MDS
19.	Ceiling Fan	Crompton Greaves Havells Orient Usha

20.	LED Lighting Fixture (Indoor) (Trim Less COB DN and Suspended light)	Disano Wever Ducre Fosnova XAL QLite
21.	Occupancy sensors	L&T, Lutron MK (Honeywell) Philips Wipro
22.	Selector Switch, Toggle switch	Kaycee Salzer (Larsen & Toubro)
23.	Fire Sealant & Fire Retardant Paint	3 M India Ltd. Hilti Promat
24.	HDPE underground cable duct	Ashlock Indelec Forend
25.	Lighting Automation	QLITE JUNG CRESTRON

**S. No. Details of Materials / Equipment**

**Manufacturer's Name**

**B. UPS SYSTEM**

1.	UPS	Eaton Power ware PCI UPS Consul Neowatt
2.	Sealed Maintenance Free Lead Acid Batteries (VRLA)	Shinkobe Exide Global Amar Raja U-PLUS
3.	Isolation Transformer Dry Type	Recon AE Abhishek Electricals
4.	Cables	Polycab Cables Universal Skytone Nicco Batra Henlay

**S. No.    Details of Materials / Equipment                      Manufacturer's Name**

**C.    STRUCTURED CABLING SYSTEM (VOICE / DATA)**

- |    |   |  |
|----|---|--|
| 1. | Cat-6 Cable                                     | Amp<br>Schneider<br>Systimax<br>Beldon |
| 2. | Patch Cords, patch panels, cross connect outlet | Amp<br>Schneider<br>Systimax<br>Beldon |
| 3. | Main DistributionFrame                          | Krone                                  |
| 4. | Metalic Conduit (ISI approved)                  | AKG<br>BEC<br>NIC                      |
| 5. | Telephone Armoured Cables                       | Finolex<br>Polycab<br>Skytone          |

**S. No.    Details of Materials / Equipment                      Manufacturer'sName**

**D.    PA**

- |    |  |  |
|----|--|--|
| 1. | Bullet Amplifiers  | Catvision<br>Dx<br>Portopia<br>Pacific Vision Hire                       |
| 2. | LNB  | Eurostar<br>Gardiner   |
| 3. | Speaker  | Ateis<br>Bose<br>Bosch<br>Philips  |
| 4. | R.F. amplifiers<br>(Head end Amplifiers & Line Amplifiers) | Catvision<br>Gain star<br>Scientific Atlanta<br>Triscope, Vision<br>Hire |

S. No.	Details of Materials / Equipment	Manufacturer's Name
<b>E. FIRE DETECTION &amp; ALARM SYSTEM</b>		
1.	Fire Alarm System with components /Accessories (i.e. FACP, Notification Appliances, Interfacing devices & Initiating devices) as per as per technical specifications.	Notifier Edwards (GST) Honeywell (Morley) Schrack
2.	FRLS / Fire Survival cable / other cables	KEI Skytone Polycab Havells Fusion
3.	PVC FRLS Conduit Accessories	AKG BEC Polycab
4.	Cable Tray	Profab MM Enterprises DTM Engg
<b>F. CCTV SYSTEM</b>		
	Indoor/Outdoor IP Cameras	Honeywell Pelco Bosch Hakvision (USA)
	Joystick with Keyboard	Honeywell Pelco Bosch Hakvision (USA)
	Network video management and recording	Milestone Genetec Nice
	Recording/Management Server	IBM Dell HP
	Fiber based SAN Storage with RAID	IBM DELL HP EMC
	LED Screen	Samsung Panasonic LG
	Rack	AP APW President Valrack

**APPENDIX – IV**

**LIST OF INDIAN STANDARDS (IS)**

- IS-325 Three phase induction motors
- IS-398 (part-1) Aluminium stranded conductors
- IS-694 PVC insulated cables for working voltage up to 1100V
- IS-732 Code of practice for electrical wiring installation
- IS-900 Code of practice for installation and maintenance of induction motors
- IS-1248 Electrical measuring meters : Part 1,2,3,4,5,6,7,8,9
- IS-1255 Code of practice for installation and maintenance of power cables including and up to 33 kV rating
- IS-1293 Three pin plugs and socket outlets
- IS-1554 (Part-1) Specification for PVC insulated (heavy duty) electric cables for working voltage up to and including 1100V
- IS-1554 (Part-2) Specification for PVC insulated (heavy duty) electric cables for working voltage from 3.3 to 11 KV
- IS-1646 Electrical installation fire safety of buildings (general) Code of practice
- IS-1777 Industrial luminaire with metal reflectors
- IS-1885 Glossary of items for electrical cables and conductors
- IS -1913 General and safety requirements for fluorescent lamps luminaries Tubular.
- IS-1944 Part 1 &2 – Code of practice for lighting of public through fares
- IS-2147 Degree of protection provided by enclosures for low voltage switchgears and control gears.
- IS-2148 Specification for double compression cable glands
- IS-2309 Protection of building and allied structure against lightning.
- IS-2418 Tubular fluorescent lamps for general lighting service
- IS-2440 Guide for day lighting of building
- IS-2551 Danger notice board
- IS-2667 Fittings rigid steel conduits for electrical wiring
- IS-2705(Parts 1 to 4) Specification for Current transformer
- IS-3043 Code of practice for earthing

- IS-3419 Fittings for rigid non-metallic conduits
- IS-3427 Metal enclosed switchgear and control gear for voltages above 1000V but not exceeding 11000V
- IS-3480 Flexible steel conduits for electrical wiring
- IS-3639 Fittings and accessories for power transformers
- IS-3636(Part 1 & 2) Code of practice for interior illumination
- IS-3837 Accessories for rigid steel conduits for electrical wiring
- IS-3854 Switches for domestic and similar purpose
- IS-3961(Parts 2,3 & 5) Current ratings for cables
- IS-4004 Application guide for surge arrestors for AC system
- IS-4012 Specification for dust proof electric light fittings
- IS-4013 Specification for dust tight electric light fittings
- IS-4146 Application guide for voltage transformers
- IS-4160 Interlocking switch socket outlets
- IS-4615 Switch socket outlets (non-interlocking type)
- IS-5039 Specification for distribution pillars upto 1100V AC
- IS-5133(part 1) Boxes for enclosure of electrical accessories Part-1 : Steel & cast iron boxes
- IS – 5077 Decorative lighting outfits
- IS-5216(Part 1&2) Recommendation on safety procedures and practices in electrical works
- IS : 5578 & Marking and arrangement of bus bars – 11353
- IS-5819 Recommended short circuit rating of high voltage PVC cables
- IS-5987 Code of practice for selection of switches
- IS-8623(Part1,2&3) Specification for Low voltage switchgear and control gear assemblies
- IS-8828 Circuit breakers for household applications – MCB
- IS-9537(Part 1 &2) Rigid steel conduits
- IS-9537(Part 3) PVC rigid conduits
- IS-10028(Part 1,2&3) Code of practice for selection, installation and maintenance of transformer
- IS-10118(Part 1,2,3&4 ) Code of practice for selection, installation and maintenance of switchgear and control gear

- IS – 10322 (Part-1) Luminaries – General requirement
- IS – 10322 (Part-2) Luminaries – Constructional requirement
- IS – 10322 (Part-3)
- IS- 10810 Methods of test for cables
- IS-11171 Specification for dry type transformer
- IS-12360 Voltage bands for electrical installation including preferred voltages and frequency
- IS-12640 Specification for RCCB
- IS-12729 Switchgear and control gear for voltage exceeding 1000V
- IS – 13021 (Part-3) Luminaries – Screw and Screwless termination
- IS – 10322 (Part-4) Luminaries – Methods of Tests
- IS- 10322 (Part-5/Sec-1) Particular requirement – General purpose Luminaries
- IS-10322 (Part-5/Sec-2) Particular requirement – Recessed Luminaries
- IS -10322 (Part-5/Sec-3) Particular requirement - Luminaries for Road and Street lighting
- IS -10322 (Part-5/Sec-4) Particular requirement – Portable General purpose Luminaries
- IS -10322 (Part-5/Sec-5) Particular requirement – Flood Lighting
- IS-13118 Specification for high voltage AC circuit breakers
- IS-13703 Specification for low voltage fuses upto 1000V
- IS-13947(Part 1,23) Specification for low voltage switchgear and control gear
- IS-15652-2006 Specification for rubber mats for electrical purposes
- IS : 1651 & 1652 Stationary cells and batteries lead acid type.
- IEEE 32 : Standard requirements, terminologies , test procedures for Neutral Grounding Resistors
- IEEE 446 : Recommended practices for Emergency & standby power systems
- IEEE 519-1992:IEEE recommended practices & Requirements for harmonic control in Electrical Power Systems
- IEEE 1100 :IEEE Recommended Practice for Powering and Grounding Electronic Equipment
- IEEE 241 Recommended Practice for Electric Power Systems in Commercial Buildings

**APPENDIX – V**

**ABBREVIATIONS**

The following abbreviations have been used in the accompanying Specifications, drawings and Schedule of Quantities.

CU	stands for copper.
GI	stands for Galvanised Iron (MildSteel)
V	stands for Volts
KV	stands for Kilo Volts
HV	stands for High Voltage (3.3 KV and above)
MV	stands for Medium Voltage (110 V ,230 V ,415 V, 600 V, 110 V)
LV	stands for Low Voltage (32 V & Below)
HT	stands for High Tension
LT	stands for Low Tension
VCB	stands for Vacuum Circuit Breaker
PVC	stands for Polyvinyl Chloride
AMP	stands for Amperes
KWH	stands for Kilowatt Hours
KW	stands for Kilo Watts
BIS	stands for Bureau of Indian Standards
IS	stands for Indian Standards
IEC	stands for International Electrotechnical Commission
IEE	stands for Institution of Electrical Engineers - London
IEEE	stands for Institution of Electrical & Electronics Engineers
NEC	stands for National Electrical Code
ACB	stands for Air Circuit Breaker
RCCB	stands for Residual Current Circuit Breaker
MCB	stands for Miniature Circuit Breaker
MCCB	stands for Moulded Case Circuit Breaker

SP	stands for Single Pole
DP	stands for Double Pole
TP	stands for Triple Pole
TPN	stands for Triple Pole and Neutral
4 Pole	stands for 3 phase and neutral of same capacity (size)
MDB	stands for Main Distribution Board
SDB	stands for Sub Distribution Board
FDB	stands for Final Distribution Board
MCC	stands for Motor Control Centre

## Technical Specifications

### 1. INTERNAL WIRING

#### 1.1 SYSTEM OF WIRING

The system of wiring shall consist of PVC insulated copper stranded conductor flexible FRLS wires in nonmetallic (Rigid heavy Duty ISI -marked fire retarded PVC Conduits of minimum 2mm Wall thickness and Sizes starting from 20 mm diameter) conduits and shall be concealed or surface mounted above false ceiling as called for.

#### 1.2 GENERAL

Prior to laying and fixing of conduits, the contractor shall mark the conduit route, carefully examine the working drawings prepared by him and approved by the Consultant indicating the layout, satisfy himself about the non-interference in the route, sufficiency of number and sizes of conduits, location of junction boxes, sizes and location of switchboxes and other relevant details. Any discrepancy found shall be brought to the notice of the Owner's site representative. Any modifications suggested by the contractor should get written approval before the actual laying of conduits is commenced.

In laying of conduits it is important that not more than two right angle bends are provided for each circuit without a pull box. No junction box shall be provided in the entire length of conduit run for drawing of wires. Only switch outlets, lighting fixture outlets, equipment power outlets and socket outlets shall be considered for drawing of wires.

#### 1.3 PVC CONDUIT AND ACCESSORIES

##### PVC Conduit

Conduits and accessories shall conform to latest edition of IS-9537 part 3 and shall be heavy duty with minimum wall thickness of 2.0 mm rigid tubes which are unscrewed without coupling and with plain ends. All conduits used shall be ISI-marked and shall not be less than 20 mm diameter.

Heavy duty Low smoke FR PVC conduit shall be used when specified.

The layout of conduit should be such that any condensation or sweating inside the conduit is drained out. Suitable precaution should also be taken to prevent entry of insects inside the conduit.

#### PVC Conduit Accessories

Accessories used for conduit shall be of an approved brand and type complying to relevant IS code.

All accessories used shall be of standard white or black colour, identical to conduit used.

Plain conduits shall be joined by slip type of couplers with manufacturer's standard sealing cement.

All conduit entries to outlet boxes, trunking and switchgear are to be made with adaptors female thread and screwed male bushes.

PVC-switch and socket boxes with round knockouts are to be used. The colours of these boxes and the conduits shall be the same.

Standard PVC circular junction boxes are to be used with conduits for intersection, Tee-junction, angle-junction and terminal. For the drawing-in of cables, standard circular through boxes shall be used.

Samples of accessories shall be submitted for approval prior to installation.

All jointing of PVC conduits shall be by means of adhesive jointing. Adequate expansion joints shall be allowed to take up the expansion of PVC conduits.

Conduit shall have the solvent cement capabilities for permanent joint and all conduit joints shall be made by using the solvent cements.

#### 1.4 BENDS IN CONDUIT

Where necessary, bends or diversions may be achieved by means of bends and / or circular cast iron boxes with inspection cover and with adequate and suitable inlet and outlet screwed joints. In case of recessed system each junction box shall be provided with a cover properly secured and flush with the finished wall surface. No bends shall have radius less than 7.5 cms or three times the outside diameter of the conduits. For metallic conduits, bends of defined radius shall be made by compactly filling fine sand inside the conduit length, to avoid non-uniform shape, once the bend is done. Proper jigs shall be used to ensure that the Enamelling /Galvanising of the Conduit is not damaged.

#### 1.5 FIXING OF CONDUITS

All conduits shall be installed so as to avoid direct exposure to steam, hot water or any other process pipes. After the conduits, junction boxes, outlet boxes and switch boxes are installed in position, their outlets shall be properly plugged or covered so that water, mortar, rodents and insects, insects or any other foreign matter does not enter into the conduit system.

Surface conduits shall be fixed by means of heavy gauge GI saddles secured at intervals not more than 1000 mm, and on either side of couplers or bends or similar fitting saddles shall be fixed at a distance of 300 mm from centre of each fitting. For conduit fixing suitable PVC/Nylon fasteners shall be used. The saddles should not be less than 24 gauge for conduits upto 25mm dia and not less than 20 gauge for larger diameter conduits. The corresponding widths shall be 19mm & 25mm. Where conduit pipes are to be laid along the trusses, steel joint etc. the same shall be secured by means of special clamps made of MS. Whereas it is not possible to drill holes in the trusses members suitable clamps with bolts and nuts shall be used (as per instruction of Engineer in charge).

For 25mm diameter conduit width of clip shall be 19mm and of 20SWG. For conduit of 32 mm and above, width of clip shall be 25mm and of 18SWG. Where conduit pipes are to be laid above false ceiling, either conduit pipes shall be clamp to false ceiling frame work or suspended with suitable

supports from the soffit of slab. For conduit pipe run along with wall, the conduit pipe shall be clamped to wall above false ceiling in uniform pattern with special clamps if required to be approved by the Engineer at site

Recessed conduiting shall be done by making chase in the masonry by chase cutter; the conduit shall be fixed in the chase by means of GI hooks not more than 600 mm apart. After fixing of conduit the chase shall be filled with cement mortar after fixing of chicken mesh and brought to the original finish level of the surface to the entire satisfaction of Owner.

The chase in the wall shall be neatly made and of ample dimensions to permit the conduit to be fixed in the manner desired. In the case of building under construction, conduit shall be buried in the wall before plastering and shall be finished neatly after erection of conduit. In case of exposed brick/rubble masonry work, special care shall be taken to fix the conduit and accessories in the position along with the building work. Entire work of chasing the wall, fixing the conduit in chases, and burying the conduit in mortar before plastering shall form part of point wiring work. The conduit pipe shall be fixed by means of staples or by means of saddles not more than 60cm apart or by any other approved means of fixing. Fixing of standard bends and elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with treated with some approved preservative compound to secure protection against rust. Suitable inspection boxes to the barest minimum requirements shall be provided to permit periodical inspection and to facilitate replacement of wires, if necessary. These shall be mounted flush with the wall. Suitable ventilating holes shall be provided in the inspection box covers. Wherever the length of conduit run is more than 10 meters, then circular junction box shall be provided. Each pipe should be connecting through junction box.

#### 1.6 SWITCH OUTLETS AND JUNCTION BOXES

All outlet boxes for switches, sockets and other receptacles shall be rust proof and shall be of 1.6 mm thick mild steel sheets with HOT dipped galvanizing (or as specified in SOQ), having smooth external and internal surfaces to true finish. All outlet boxes for receiving plug sockets and switches shall be fabricated to approved sizes. All boxes shall have adequate number of knock out holes of required diameter and earthing terminal screws. Outlet boxes shall generally be of 50mm depth subject to maximum depth of 65 mm.

#### 1.7 INSPECTION BOXES

50 mm dia inspection boxes and pull boxes shall have smooth external and internal finish to facilitate removal and replacement of wires, where required.

The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit after erection shall be tested for mechanical and electrical continuity throughout and permanently connected to earth conforming to the requirement by means of special approved type of earthing clamp effectively fastened to conduit pipe in a workmen like manner for a perfect continuity between the earth and conduit. Gas, Water pipe shall not be used as earth medium.

#### 1.8 FISH WIRE

To facilitate subsequent drawing of wires in the conduit, GI fish wires of 2.0 mm (14 SWG) shall be provided alongwith the laying of recessed conduit.

#### 1.9 CONDUCTORS

All PVC insulated copper conductor flexible FRLS or ZHFR, as specified in BOQ, wires shall conform in all respects to Standards as listed under sub-head Indian Standards and shall be IS approved and ISI marked.

#### 1.10 BUNCHING OF WIRES

Wires carrying current shall be so bunched that the outgoing and return wires are drawn into the same conduit. Wires originating from two different phases shall not run in the same conduit. All wires shall have ferrules for identification. Lighting and power circuits shall be separate. Each Power/ Light Circuit's Neutral shall be individual per Circuit and shall not be looped from any other Circuit.

1.11 DRAWING CONDUCTORS

The drawing and jointing of PVC insulated copper conductor wires shall be executed with due regard to the following precautions. While drawing wires through conduits, care shall be taken to avoid scratches and kinks which may cause breakage of conductors. There shall be no sharp bends. Wire reel stands to be used for pulling of wires to avoid kinks. Care shall be exercised while drawing the wires from reels, by taking appropriate measures to ensure that wires are not spread on ground, causing dust and dirt accumulation on the new wires.

Maximum permissible number of 1100 volt grade PVC insulated wires that may be drawn into metallic Conduits are given below :

Size of wires Nominal Cross section Area (Sq. mm.)	Maximum number of wires within conduit size(mm)				
	20	25	32	40	50
1.5	5	10	14	--	--
2.5	5	8	12	--	--
4	3	7	10	--	--
6	2	5	8	--	--
10	--	3	5	6	--
16	--	2	3	6	6
25	--	--	2	4	6
35	--	--	--	3	5

Maximum permissible number of 1100 volt grade PVC insulated wires that may be drawn into rigid nonmetallic or PVC Conduits are given below:

Size of wires Nominal Cross Section Area (Sq. mm.)	Maximum number of wires within conduit size(mm)				
	20	25	32	40	50
1.5	7	12	16	--	--
2.5	5	10	14	--	--
4	4	8	12	--	--
6	3	6	8	--	--
10	--	4	5	6	--
16	--	3	3	6	6
25	--	--	2	4	6
35	--	--	--	3	5

Insulation shall be removed by insulation stripper only. Few Strands of wires shall not be cut/reduced for convenience in connecting into terminals. The terminals shall have sufficient cross sectional area to take all strands and it's connecting brass screws shall have flats ends. All looped joints shall be connected through terminal block/connectors. The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less. All light points shall be terminated through a connector.

Conductors having nominal cross sectional areas exceeding 10 sq.mm shall always be provided with cable sockets. At all bolted terminals brass flat washer of large area and approved steel spring washer shall be used. Brass nuts and bolts with brass washers shall be used for all connections.

Only licensed wiremen (Before doing the work or before appointing him on site contractor has to submit his wiring license to Owner) and cable jointers shall be employed to do jointing work. Before entrusting cable jointing work to any technician, or before appointing Cable Jointers or Wiremen on Site, Contractor has to submit such Technicians' / Wireman's / Cable Joints' license to Owner.

All wires and cables shall be embossed with the manufacturer's label with ISI mark and shall be brought to site in original packing. For all internal wiring. PVC insulated wires of 1100 volts grade (FRLS) shall be used.

The sub-circuit wiring for point shall be carried out in loop system and no joints shall be allowed in the length of the conductors. No wire shall be drawn into any conduit until all defective work of conduit installation of any nature that may cause injury to wire is completed. Care shall be taken while pulling out the wires so that no damage occurs to conduits/wire itself, the conduits shall be thoroughly cleaned of moisture, dust, dirt or any other obstruction. The minimum size of PVC insulated copper conductor wires for all sub-circuit wiring for light points shall be minimum 2.5 sq.mm copper. Separate neutral to be pulled for each circuit.

#### 1.12 JOINTS

All joints shall be made at main switches, distribution boards, socket outlets, lighting outlets and switches boxes only. No joints shall be made in conduits and in junction boxes. Conductors shall be continuous from outlet to inlet.

#### 1.13 MAINS AND SUB-MAINS

Mains and sub-mains cable or wires where called for shall be of the rated capacity and approved make. Every main and sub main wires shall be drawn into an independent adequate size of conduit. Earthing shall be in conformity with relevant IS codes and calculations shall be submitted for verification. An independent earth wire of the proper rating shall be provided for every single phase sub-main. For every 3-phase sub-main, 2 No. earth wires of proper rating shall be provided alongwith the sub-main.

The earth wires shall be drawn along with circuit wires through conduit. Where mains and sub-mains cables are connected to switchgear, sufficient extra lengths of cable shall be provided to facilitate easy connections and maintenance. Where ever necessary, powder-coated 1.6 mm thick sheet steel covering (also called trunking) shall be provided to cover the group of conduits and cables entering and exiting the Wall mounted/Floor mounted Sub-DBs, DBs, and FDBs, so that the Installation looks neat. The colour of such sheet steel covering (trunking) shall be matching with the colour of the SDBs, DBs and FDBs

#### 1.14 LOAD BALANCING

Balancing of circuits in three phase installation shall be as planned by the Consultants in the tender drawings and shall be checked by the contractor before the commencement of wiring and shall be strictly adhered to.

#### 1.15 COLOUR CODE OF CONDUCTORS

Colour code shall be maintained as indicated by the Consultant for the entire wiring installations. Red, yellow, blue shall be for three phases, black for neutral and green with yellow band shall be for earthing.

1.16 FLOOR RACEWAY

Floor raceway shall be of 2mm thick heavy duty hot dipped galvanised and the dimensions for the same shall be as per the BOQ. The raceways shall be as per the make specified in the tender. The raceways shall be free of any sort of welding edges or other sharp edges to protect cutting of wires during pulling. The raceways shall be laid with use of junction boxes fabricated from 2mm thick hot dip GI.

Junction Boxes: Junction boxes made of sheet metal having a corrosion resistant finish. Provide access opening with heavy gauge inner plate and capable of minimum leveling adjustment of 3/8 inch after base has been fastened in floor slab. Provide junction box with 4 screws for adjusting height and leveling complete box. Provide the following additional features junction box raceway openings to match raceway system.

Contractor to provide hold-down strap for securing raceway in the floor

1.17 INSTALLATION

INSPECTION: Examine areas and conditions under which underfloor raceways are to be installed, and substrate which will support raceways.

GENERAL: Install underfloor raceways as indicated, in accordance with manufacturer's written instructions, applicable requirements of NFPA 70, and National Electrical Contractors Association (NECA) "Standard of Installation" and complying with recognized industry practices.

COORDINATION: Coordinate with other work including metal and concrete deck work, as necessary to interface installation of electrical raceways and components of other work. Plan and route underfloor raceway systems to prevent interference with other work without increasing thickness of floor construction.

2. SWITCHES, RECEPTACLES (MODULAR), LIGHTING FIXTURES

All switches shall be enclosed type flush mounted suitable for 240 volts AC. All switches shall be fixed inside the switch boxes on adjustable flat M S strips/plates with tapped holes and brass machine screws, leaving ample space at the back and sides for accommodating wires. Switch controlling the light point shall be connected to the phase wire of the circuit and load shall be restricted to maximum **800 watts per switch & maximum 1500 watts per circuit**. All wiring accessories shall be BIS approved. Perfect alignment shall be maintained while fixing of the back boxes.

All switches and sockets are modular type which shall be made of fire retardant; self-extinguish polycarbonate plastic, able to withstand the glow wire test at 960 deg. C.

The switches shall conform IS 3854 :1997, The internal design of terminals and contact shall make the switch capable of high overload conditions, The switch shall be of flush type with silver inlay contact on pure copper

All switches, sockets, telephone outlets, controlling the lights or fans shall be connected to the phase wire of the circuit. Switches shall be located at 1200mm above finished floor level unless otherwise indicated on drawings.

Switches shall be suitable for indoor or outdoor service according to location housed in standardized purpose manufactured galvanized steel boxes completed with conduit knockouts made up into single or multi-gang units employing a grid switch system of fully interchangeable components at standardized fixing centers of matching switches of different types and ratings but of identical dimensions, push buttons, neon indicator lamps, blanking units, grids, steel boxes and plates all capable of integration into standard composite assemblies in any combination as required.

Grids shall be adjustable for variation in depth of plaster and for squaring errors and of the same type for surface or flush mounting.

Switches located on brick or concrete walls shall be mounted in horizontal arrangement in plaster depth steel boxes or in galvanized steel boxes using box suspension straps and cover plates. Countersunk screws shall be provided for fixing to the conduit boxes.

Switches for external use shall be of weatherproof construction with IP65 rating unless otherwise specified. Samples of all switches, conduit boxes and plaster depth boxes shall be submitted to the Engineer for approval prior to installation.

Switches shall be rated for 6 Amps (minimum light switch rating 6A), 16 Amps or 20 Amps (as determined by circuit load). Inductive lighting circuit shall be assessed at twice the steady state connected load current.

## 2.1 SOCKET OUTLET

Socket outlets shall be of the three pin. All socket shall fully comply with IS 1293: 2005 specifications.

The switch controlling the socket outlet shall be on the phase wire of the circuit and not more than two socket outlets of 16 amps shall be connected on one circuit. An earth wire shall be provided along with the circuit wires and shall be connected to earthing screw inside the box. All sockets shall be shuttered type.

- a. Every socket outlet shall be controlled by an individual switch unless mentioned otherwise.
- b. The switch controlling the socket outlet shall be on the 'Live' side of the line.
- c. 6 amps and 16 amps socket outlet shall normally be fixed at any convenient height above the floor level as desired by the Architect. The switch for 6 and 16 amps, socket outlet shall be kept along with the socket outlet. However, in special case, if desired by the Architect the 6 amp. socket outlet can be placed at the normal switch level.  
16 amps socket outlet in the kitchen of the residential or commercial buildings shall be fixed at any convenient height above working platform or as specified in drawings / schedule of equipments.

In a room containing a fixed bath or shower, there shall be no socket outlet and there shall be no provision for connecting a portable appliance. Any stationary appliance connected permanently in the bath room shall be controlled by an isolator switch or circuit breaker having outlets at such location where water / moisture does not effect. Generally, switches and outlets shall be planned at a minimum distance of 1.5 Metre away from any water supply outlet, so that splashed water may not affect the live installation.

- d. Where socket outlets are placed at lower level, they shall be enclosed in a suitable metallic box with the system of wiring adopted or shutter type sockets shall be provided as specified.
- e. In an earthed system of supply, a socket outlet and plug shall be of three pin type, the third terminal shall be connected to earth.
- f. Conductors connecting electrical appliance with socket outlet shall be flexible twin cord with an earthing cord which shall be secured by connecting between the earth terminal of plug and the metallic body of the electrical appliance.
- g. Where use of shutter type of interlocking type of socket is required for any special installation, the items should be separately and specifically listed in the Schedule of Quantities of that particular work.

- h. All switches, sockets, telephone and TV outlets etc. shall be fixed on 3mm thick phenolic laminated sheet cover unless otherwise called for in drawing or BOQ. Flush cover plate shall be secured to the box with counter sunk brass screws & cup washers.
- i. All 5 and 15Amp socket outlet shall be modular type 5/6 pin respectively. Each outlet shall have a switch located beside the socket preferable on the same flush cover plate.
- j. The earth terminal of the socket shall be connected to the earth wire.

Generally switch socket outlets shall be positioned 300 mm above floor level except in plant rooms, kitchen, etc. where they shall be positioned 1400 mm above floor level or 150 mm above counters or benches as per requirement unless otherwise specified.

## 2.2 LIGHTING FIXTURES & ACCESSORIES

The light fixtures and fittings shall be LED type assembled and installed in position complete and ready for service, in accordance with details, drawings, manufacturer's instructions and to the satisfaction of the Project Manager.

### 2.2.1 Scope:

Scope of work under this section shall include inspection at suppliers/manufacturer's premises at site, receiving at site, safe storage, transportation from point of storage to point of erection, erection and commissioning of light fittings, fixtures and accessories including all necessary supports, brackets, down rods and painting etc as required.

### 2.2.2 Standards:

The lighting and their associated accessories such as lamps, reflectors, housings, ballasts etc., shall comply with the latest applicable standards, more specifically the following:

Industrial lighting fittings with metal reflectors	-	IS - 1777
Decorative lighting outfits	-	IS - 5077
Bayonet lamp holders	-	IS - 1258
Bi-pin lamp holders for tubular fluorescent lamps	-	IS - 3323
Luminaries – General requirement	-	IS – 10322 (Part-1)
Luminaries – Constructional requirement	-	IS – 10322 (Part-2)
Luminaries – Screw and Screwless termination	-	IS – 10322 (Part-3)
Luminaries – Methods of Tests	-	IS – 10322 (Part-4)
Particular requirement – General purpose Luminaries	-	IS – 10322 (Part-5/Sec-1)
Particular requirement – Recessed Luminaries	-	IS – 10322 (Part-5/Sec-2)
Particular requirement – Luminaries for Road and Street lighting	-	IS – 10322 (Part-5/Sec-3)
Particular requirement – Portable General purpose Luminaries	-	IS – 10322 (Part-5/Sec-4)

2.2.3 Light Fittings-General Requirements :

- a. Fittings shall be designed for continuous trouble free operation under atmospheric conditions without reduction in lamp life or without deterioration of materials and internal wiring. Degree of protection of enclosure shall be IP-65 for outdoor fittings except bulkhead fitting. Bulkhead fitting shall be provided with IP-54 protection.
- b. Fittings shall be so designed as to facilitate easy maintenance including cleaning, replacement of lamps/ ballasts.
- c. All fittings shall be supplied complete with lamps. All mercury vapour and sodium vapour lamp fittings shall be complete with accessories like ballasts, power factor improvement capacitors, starters, etc. Outdoor type fittings shall be provided with weather proof junction boxes (IP-55) and IP-54 Control gear boxes. All fluorescent and CFL fittings shall be provided with electronic ballast as per schedule of quantities.
- d. Each fitting shall have a terminal block suitable for loop-out connection by 1100 V PVC insulated copper conductor wires upto 4 sq.mm. the internal wiring should be completed by the manufacturer by means of standard copper wire and terminated on the terminal block.
- e. All hardware used in the fitting shall be suitably plated or anodized and passivated.
- f. Earthing: Each lighting fitting shall be provided with an earthing terminal. All metal or metal enclosed parts of the housing shall be bonded and connected to the earthing terminal so as to ensure satisfactory earthing continuity throughout the fixture.
- g. Painting/Finish: All surfaces of the fittings shall be thoroughly cleaned and degreased and the fittings shall be free from scale, rust, sharp-edges, and burns.
- h. The housing shall be powder coated/stove-enameled or anodised as required. The surface shall be scratch resistant and shall show no sign of cracking or flaking when bent through 90 deg. over 12 mm dia mandrel.
- i. Metal used in BODY of lighting fixtures shall be not less than 22 SWG or heavier if so required to comply with specification of standards. Sheet steel reflectors shall have a thickness of not less than 20 SWG. The metal parts of the fixtures shall be completely free from burns and tool marks. Solder shall not be used as mechanical fastening device on any part of the fixture.

2.2.4 Light Fittings – Special Requirements

All lighting fixture shall be LED type with minimum 80% efficacy.

Box Channel Type Industrial Fittings

Box type slim line channel must be in screwless construction manufactured from M.S. CRCA sheet steel powder coated with MS CRCA cover, powder coated white. Light reflection surface in Box/Channel type fittings shall be in a POLYESTER PRECOATED STEEL having a reflection factor of not less than 80%. SCREWLESS DESIGN & CONSTRUCTION Light fixtures shall be preferred due to their ease of maintenance, especially for box/channel for box/channel type fixtures.

Moisture Proof Industrial Fittings

Surface mounted totally enclosed moisture proof fixtures must be in polycarbonate body and diffuser with transparent prismatic interior and smooth exterior and frosted end. Fixture must be completely sealed with polyurethane double gasket to achieve IP 65 protection. Fixture is complete with CRCA steel white powder coated / enameled finish reflector.

2.2.5 Accessories for Light Fittings - Reflectors

The reflectors shall be made of CRCA sheet steel/aluminium /Silvered glass/Chromium plated sheet copper as specified. The thickness of reflectors shall be as per relevant standards. Reflectors made of steel shall have stove enameled/ vitreous enameled/epoxy coating finish. Aluminium used for reflectors shall be anodized/epoxy stove enameled /mirror polished. The finish for the reflector shall be as specified. The reflectors shall be free from scratches / blisters and shall have a smooth and glossy surface having optimum light reflecting coefficient. Reflectors shall be readily removable from the housing for cleaning and maintenance without use of tools.

2.2.6 Installation

Fixtures shall be installed at mounting heights as detailed on the Drawings or as instructed on site by the Engineer.

All light fittings shall be supported with appropriate fixing accessories such as clips, supporting brackets, suspension sets, nuts, washers, screws etc. for their proper installation on different types of ceiling panels. Suspension sets shall be of adjustable type suitable to carry the weight of the lighting fittings unless otherwise stated or indicated on drawings. The suspension sets shall be generally of 900 mm length. Exact lengths required shall be provided to suit the site requirement.

2.2.7 The Testing

After all lighting fixtures are installed and are connected their respective switches, test all fixtures to ensure operation on their correct switch in the presence of the Engineer. All un-operating fixtures or ones connected to the wrong or inconveniently located switch shall be correctly connected as directed by the Engineer.

**3. MEDIUM VOLTAGE 1.1 KV GRADE XLPE / PVC CABLES**

3.1 GENERAL

The MV cables shall be supplied, inspected, laid, tested and commissioned in accordance with drawings, Specifications, relevant Standard Specifications and cable manufacturer's instruction.

The cables and cables jointing & terminating accessories shall comply with the requirements of latest revision of the following codes/standards, unless otherwise specified:

IS: 1554 -Specification for PVC Insulated (Heavy Duty) Electric Cables

IS: 3961 -Recommended current ratings for cables

IS: 3975 -Mild steel wires, formed wires and tapes for armouring of cables

IS: 5831 -PVC insulation and sheath of electric cables

IS: 6474 -Polyethylene insulation and sheath of electric cables

IS: 7098 –Cross-linked polyethylene insulated PVC sheathed cables

IS: 8130 -Conductors for insulated electric cables and flexible cords

IS: 10810 -Methods of Test for Cables

IEC: 60028 -International Standard of Resistance for Copper

IEC: 60502 -Power cables with extruded insulation & their accessories for rated voltage from 1kV upto 30kV.

IEC 60228 - Conductors of insulated cables. Guide to the dimensional limits of circular conductors.

IEC 60331 Parts 11 & 21 -Fire resisting characteristics of electric cables

IEC 60332 Part 3-10 - Tests on electric cables under fire conditions. Part 3: Tests on bunched wires or cables.

IEC 60754 Part 1 - Test on gases evolved during combustion of materials from cables. Part 1: Determination of the amount of halogen acid gas evolved during combustion of polymeric material taken from cables.

IEC 60811 Parts 1 & 2 - Common test methods for insulating and sheathing materials of electric cables.

IEC 60885 Parts 1, 2 & 3 - Electric test methods for electric cables.

IEC 61034 Parts 1 & 2 -Measurement of smoke density of electric cables burning under defined conditions

In case of imported item, the standards of the country of origin shall be applicable if these standards are equivalent or more stringent than the applicable Indian standards.

The cables shall also conform to the provisions of Indian Electricity Rules and other statutory regulations currently in force in the country. In case Indian standards are not available for any item, standards issued by IEC/IEEE or equivalent agency shall be applicable.

### 3.2 MATERIAL

The MV cables shall be cross linked polyethylene (XLPE) insulated PVC inner sheathed and HR PVC / FRLS PVC outer sheath of 1100 volts grade as asked for in the schedule of quantities. Cables up to 16 sq.mm shall be with copper conductor and 25 sq.mm and above shall be with aluminum conductor.

The MV cables 25 sq. mm & above shall be cross linked polyethylene (XLPE) insulated PVC inner sheathed and FRLS PVC outer sheath of 1100 volts grade. Cables below 25 sq.mm shall be with copper conductor, with HR PVC core insulation and sheathing..

#### 3.2.1 Specifications of PVC insulated copper cable shall be as follows:

##### a. Conductor

The conductors shall be solid for conductor of nominal area of up to 10 mm<sup>2</sup> for Aluminum, and the conductor shall be solid or stranded for nominal area of 1.5 mm<sup>2</sup> to 6 mm<sup>2</sup> for Copper. The conductor from 10 mm<sup>2</sup> and above for Copper and from 16 mm<sup>2</sup> and above for Aluminum shall be stranded as per IS 8130. Cables with reduced neutral conductor shall have sizes as per Table 1 of IS 1554.

##### b. Insulation

The core insulation shall be with PVC compound applied over the conductor by extrusion and shall conform to the requirements of type 'A' compound as per IS: 5831. The thickness of insulation and the tolerance on thickness of insulation shall be as per Table 2 of IS: 1554. Control cables having 6 cores and above shall be identified with prominent and indelible Arabic numerals on the outer surface of the insulation. Colour of the numbers shall contrast with the colour of insulation with a spacing of maximum 50 mm between two consecutive numbers. Colour coding for cables up to 5 cores shall be as per Indian standard.

c. Laying-up

Insulated conductors of multi core cables shall be with thermoplastic fillers in the interstices. The phase identification of cores shall be by coloured strips.

d. Inner Sheath

Cores shall be surrounded either by a wrapped or an extruded PVC sheath.

The inner sheath shall be applied over the laid-up cores by extrusion and shall be of PVC conforming to the requirements of Type ST-1 PVC compound as per IS: 5831. The minimum thickness of inner sheath shall be as per IS: 1554. Single core cables shall have no inner sheath.

e. Armouring

The armouring shall be provided over the inner sheath.

Single core cable shall have dia -magnetic armouring. If armouring is specified for multi core cables in the data sheet, the same shall be by single round galvanized steel wires where the calculated diameter below armouring does not exceed 13 mm and by galvanized steel strips where this dimension is greater than 13 mm. Requirement and methods of tests for armour material and uniformity of galvanization shall be as per IS: 3975 and IS: 10810. The dimensions of Armour shall be as per method (b) of IS: 1554. If armouring is specified for single core cables in the data sheet, the same shall be with H4 grade hard drawn aluminium round wire of 2.5 mm diameter.

f. Outer Sheath

Single and multi-core cables are provided with an extruded FRLS grade PVC outer-sheath. The thickness of the sheath shall be as per IS:1554-1988. The PVC compound for the outer-sheath shall confirm to Type ST1 of IS 5831. The colour of the outer sheath shall be black with marking at every meter.

Suitable additives be added to prevent attack by rodents and termites. All serving must be given anti-termite treatment.

3.2.2 Specifications for XLPE aluminium / copper cable shall be as follows:

a. Conductor

Stranded compacted circular conductor shall be of electrical grade high conductivity aluminium per IS 8130/84

b. Insulation

The insulation shall be of natural unfilled chemically cross linked polyethylene conforming to IS 7098. The thickness of insulation shall be as per the relevant codes.

It shall be free from voids and shall withstand all mechanical and thermal stresses under steady state and transient operating conditions.

The insulation screen shall consist of non-metallic extruded semi-conducting compound in combination with a non-magnetic metallic copper/Aluminium screen. Unless specified otherwise, the copper/Aluminium screen for all the three cores together shall be capable of carrying the single line to ground fault current value and the duration specified in the data sheet.

The conductor screen, XLPE insulation and insulation screen shall all be extruded in one operation by Triple Extrusion' process to ensure perfect bonding between the layers. The core identification shall be by coloured strips or by printed numerals

c. Laying-up

Insulated conductors of multi core cables shall be with plastic fibre in the interstices. The phase identification of cores shall be by coloured strips.

d. Inner Sheath

The cores shall be surrounded by either a wrapped or by an extruded PVC sheath.

The thickness of the inner sheath shall be as indicated in the relevant codes.

The inner sheath shall be applied over the laid up cores by extrusion and shall conform to the requirements of type ST 2 compound of IS: 5831. The extruded inner sheath shall be of uniform thickness. In case of single core cables, there shall be extruded inner sheath between insulation metallic screen and armouring.

e. Armouring

The armouring shall be provided over the inner sheath.

Single core cable shall have non-magnetic armouring. Multi core cables shall have either galvanized round steel wires or flat steel strip. Steel wires and strips for armouring conform to IS:3975. The direction of lay of armouring shall be opposite to that of cores.

f. Outer Sheath

Single and multi-core cables are provided with an extruded FRLS grade PVC outer-sheath. The thickness of the sheath shall be as per IS:1554-1988. The PVC compound for the outer-sheath shall conform to Type ST2 of IS 5831. The colour of the outer sheath shall be black with marking at every meter.

3.2.3 Current ratings of the cables shall be as per IS : 3961. The Conductor shall be stranded Aluminum/Copper circular/ sector shaped and compacted. In multi core cables the core shall be identified by red, yellow, blue and black coloring of insulation. Repaired cables shall not be used.

3.2.4 The cables shall be suitable for laying in racks, ducts, trenches, conduits and underground buried installation with uncontrolled back fill and chances of flooding by water.

3.2.5 Progressive automatic in line sequential marking of the length of cables in meters at every one meter shall be provided on the outer sheath of all cables.

3.2.6 Cables shall be supplied in non-returnable wooden drums as per IS : 10418.

Both ends of the cables shall be properly sealed with PVC/Rubber caps so as to eliminate ingress of water during transportation, storage and erection.

3.2.7 The product should be coded as per IS :- 7098 Part-I as follows :-

Aluminium Conductor	A
XLPE Insulation	2X
Steel round wire armour	W
Steel strip armour	F
Steel Double round wire armour	WW

Steel Double strip armour	FF
Non-magnetic (Al.) round wire armour	Wa
Non-magnetic (Al.) strip armour	Fa
PVC outer sheath	Y

Control cables and indicating panel cables shall be multi core PVC insulated copper conductor and armoured cables.

### 3.3 INSPECTION

All cables shall be inspected by the contractor upon receipt at site and checked for any damage during transit.

### 3.4 JOINTS IN CABLES

The Contractor shall take care to see that all the cables received at site are apportioned to various locations in such a manner as to ensure maximum utilization and avoid cable jointing. This apportioning shall be got approved by the Owner's site representative before the cables are cut to lengths. Where joints are unavoidable heat shrinkable type joints shall be made. The location of such joints shall be got approved from the Owner's site representative and shall be identified through a marker.

### 3.5 JOINTING BOXES FOR CABLES

Cable joint boxes shall be installed with heat shrinkable sleeve and of appropriate size, suitable for XLPE armoured cables of particular voltage rating.

### 3.6 JOINTING OF CABLES

All cable joints shall be made in suitable, approved cable joint boxes and the filling in of compound shall be done in accordance with manufactures' instructions and in an approved manner. All straight through joints shall be done in epoxy mould boxes with epoxy resin.

All cables shall be joined colour to colour and tested for continuity and insulation resistance before jointing commence. The seals of cables must not be removed until preparations for jointing are completed. Joints shall be finished on the same day as commenced and sufficient protection from the weather shall be arranged. The conductors shall be efficiently insulated with high voltage insulating tape and by using of spreaders of approved size and pattern. The joints shall be completely topped up with epoxy compound so as to ensure that the box is properly filled.

### 3.7 CABLE END TERMINATIONS

Cable end termination shall be done in cable terminal box using crimping sockets and proper size of glands of double compression type

### 3.8 BONDING OF CABLES

Where a cable enters any piece of apparatus, it shall be connected to the casing by means of an approved type of armour clamp and gland. The clamps must grip the armouring firmly to the gland or casing, so that no undue stress is passed on to the cable conductors.

### 3.9 CABLE ACCESSORIES

The termination and straight through jointing kits for use on the systems shall be suitable for the type of cables offered as per this specification.

The accessories shall be supplied in kit form. Each component of the kit shall carry the manufacturer's mark of origin.