

**HLL INFRA TECH SERVICES LIMITED**  
**(Subsidiary of HLL Lifecare Ltd., A Government of India Enterprise)**

**E-TENDER**

**FOR**

**VERTICAL EXTENSION OF COLLEGE BUILDING AT  
GOVERNMENT DENTAL COLLEGE, THRISSUR (PHASE-II)**

**Tender No. HITES/IDS/22/27**  
**(e-tender Id: 2023\_HITES\_566206\_1 )**

**Volume- III**

**SPECIAL CONDITIONS OF CONTRACT**



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## **SECTION A - GENERAL**

### **General**

The following Specific Conditions of Contract shall be read in conjunction with General Conditions of Contract. If there are any provisions in these Specific Conditions of Contract which are at variance with the provisions in the above mentioned documents, the provisions in these Specific Conditions of Contract shall take precedence.

### **1. Scope of Contract**

Bids are now invited for the work of Vertical Extension of College Building at Government Dental College Thrissur (Phase II).

The scope of work includes construction of 2 additional floors above existing Ground Floor of Dental College building and Construction of Sump & Pump room, Substation in the Government Dental College, Campus at Thrissur

Proposed area for construction as per the scope of work:

- First Floor : 3656 Sqm
- Second Floor : 3656 Sqm
- Sump and Pump room : 320 Sqm
- Substation : 231 Sqm

It includes civil works, Plumbing works, Electrical Works, ELV,HVAC, Fire Fighting works, Lift, Signages, Building signage's, Substation & DG Building, RWH. Sump & Pump Room, Site Development, Landscaping etc.

The activities to be carried out for the completion of the Project shall include the following and any additional activities incidental to these:

- i. Scope of work as specified.
- ii. Submission of 3 sets of completion (i.e. 'as-built') drawings and other related documents, both a hard copy and the soft copy in Auto CAD or any other IT application used for the purpose.

The scope of work also includes preparation of all detailed shop drawings, obtaining approvals at different stages from local authorities, electrical inspector, lifts inspector, water & sewer line connection, pollution, permission/approval for tree cuttings, permission for bore well, completion certificates, occupancy certificate and all other required statutory approvals/ clearances from relevant Statutory authorities.

### **2. Drawings**

#### **2.1. Tender Drawings**

The tender drawings are for Tender Purpose only and are intended as a guide to the Bidder/ Contractor and give general layout of buildings and general information of the structures and general positions of utilities, services and equipment only. Contractor's quoted rate for any item should not be based on any measurement, quantity, and specification from these drawings. Any claim raised by the contractor in this regard shall not be valid in this contract and shall not be accepted by the HITES.

#### **2.2. Issue and custody of drawings & specifications**

The contractor on signing of contract shall be furnished free of cost one copy of all drawings and all

further drawings issued during the progress of the works. The contractor shall keep one copy of all drawings at the works site and the Engineer-in-charge shall have, at all reasonable times, access to the same.

The drawings shall be provided to the Contractor as per the schedule (prepared at the start of the works and necessarily updated or revised from time to time) as mutually agreed by the Engineer-in-charge and the Contractor. Last major drawings may be provided as per the schedule prior to the stipulated date of completion and the Contractor, if found necessary shall increase his resources and effort so as to complete the works within stipulated time.

From time to time during the course of contract revised drawings may be issued to the Contractor and the Contractor shall ensure that all superseded drawings are removed from site and stored in a lockable cabinet as directed by the Engineer-in-charge and replaced by revised drawings.

The Contractor shall maintain complete up to date Register of drawings issued at site. All drawings shall be properly numbered and indexed for ready reference. Superseded drawings should be properly identified.

The contractor shall ensure that only the valid up to date drawings are used for setting out, construction and preparation of as built drawings etc.

### 2.3. Bar Bending Schedule

Contractor shall prepare bar bending schedules and shall get them approved from the Engineer-in-charge or his authorized representative.

### 2.4. Working drawings/ Shop drawings/ Design:

The tender drawings listed in the tender documents are indicative for the purpose of detailing and requirement of the contract. The contractor shall take into consideration space allocated for equipment's before ordering them to ensure that the equipment would fit in the space provided with necessary clearances required as per the relevant standard/ manufacturer's recommendations. In case of any difficulty it should be brought to the notice of the Engineer - in- Charge.

Detailing for shop drawings of services included in the scope of work of contractor will have to be done by the contractor based on the schematics and other details provided by the Engineer-in-charge or local authorities. The work will be executed by the contractor based on the approved shop drawings from the concerned authority and accordingly contractor will be responsible for obtaining all required final NOC/ clearance from concerned authorities. These drawings and details shall also contain details of construction, size, arrangement, operating clearances, performance characteristics and capacity of all items of equipments and also details of all related items of work by other discipline.

The contractor shall submit to the Engineer-in-charge for approval details of all proposed equipment, accessories, equipment characteristics and capacity details of all equipment, accessories and devices etc. as per the specifications and obtain approval of the Engineer-in-charge.

In case there is delay in any drawings and design viz shop drawings, or specialized works drawings etc. to be supplied by the contractor, Engineer-in- Charge may ask the Contractor to make necessary changes, as required. In case of failure on the part of the contractor to carry out the directions of the Engineer - in- Charge action may be taken to get the needful done at the risk and cost of the Contractor. All drawings shall be signed by Contractor or their authorised representative with name, seal and date before submission to Engineer-in-charge.

2.4.1 Engineer in charge shall issue the Good For Construction (GFC) Drawings to the contractor for Electrical & ELV services in the following pattern:

- Floor layouts indicating position of light fixtures, small power sockets (Raw & UPS), Power supply points for various mechanical equipments under HVAC & firefighting services etc.

- Floor layouts showing position of distribution boards for various services (lighting, small power, UPS etc.), floor electrical panels for various services
- DB schedules, Single line diagrams of electrical panels
- Site electrical plan indicating position of power intake arrangement (FP/DP structure, metering point), HT cable route, position of substation, DG set etc.
- External lighting plan indicating position of street light
- Lightning protection system layout
- Floor layouts indicating position of CCTV cameras, speakers, fire alarm devices, telephone outlets, data outlets
- Riser diagrams of CCTV, Public address, Fire alarm, telephone system, data system, etc.

2.4.2 The Contractor shall carry out and complete the said work in every respect in accordance with this Contract and with the directions of and to the satisfaction of the Engineer-in-charge. The Engineer-in-charge may in his absolute discretion and from time to time further issue drawings and/or written instructions, details, directions and explanations, which are hereafter collectively referred to as “Engineer-in-charge’s Instructions” in regard to:

- a. The variation or modification of the design, quality or quantity of items of works or the addition or omissions or substitution of any item.
- b. Any discrepancy in the drawings or between the bill of quantities and/or drawings and/or specifications.
- c. The removal from the site of any material brought thereon by the contractor and the substitution of any other material thereof.
- d. The removal and/or re-execution of any works executed by the contractor.
- e. The removal of any persons employed by the contractor on the site.
- f. The opening up for inspection of any work covered up.
- g. The amending and making good of any defects noticed during or after execution of the work.

The Contractor shall forthwith comply with and duly execute any work in compliance to above instructions provided always that verbal instructions, directions and explanations given to the contractor or his representative by the Engineer - in- Charge, shall, if involving a variation, be confirmed in writing by the Contractor within seven days, and if not dissented in writing within a further seven days by the Engineer - in- Charge, these shall be deemed to be Engineer - in- Charge’s instructions within the scope of the contract.

## 2.5. Shop Drawings

2.5.1. The Contractor shall furnish for approval of the Engineer-in-charge three sets of detailed sanitary, plumbing, firefighting (external & internal), Pump room & Shop drawings of all equipments and materials required to complete the work as per specifications well in advance. These drawings shall contain details of construction, size, arrangement, operating clearances, performance characteristics, and capacity of all items of equipment, as also the details of all related items of work of other trades. All shop drawings are to be made in accordance with latest fire safety norms and building codes.

2.5.2. All drawings necessary for assembly, erection, maintenance, repair and operation of the equipment shall be furnished and different parts shall be suitably numbered for identification and ordering of spare parts.

2.5.3. For any amendments proposed by Engineer-in-charge in the above drawings, the Contractor shall supply fresh sets of drawings with the amendments duly incorporated, along with the drawings on which corrections were indicated.

2.5.4. No material or equipment may be brought at Site until the Contractor has the approved Shop drawings for that particular material or equipment.

2.5.5. After approval of the drawings by the Engineer-in-charge, the Contractor shall further furnish six sets of Shop drawings for the exclusive use of and retention by the Engineer-in-charge. Approval of drawings by the Engineer-in-charge shall not relieve the Contractor of any obligation to meet all the requirements of the Contract or of the correctness of his drawings. The Engineer-in-charge's approval of specific item shall not mean the approval of the assembly of which it is a component. The Contractor shall be responsible for and is to bear the cost for all alternations of the works due to discrepancies or omission in the drawings or other particulars supplied by him, whether such drawings have been approved by the Engineer-in-charge or not.

2.5.6. Where the work of the Contractor has to be installed in close proximity to, or will interfere with the work of other trades, the Contractor shall assist in working out the space conditions to make a satisfactory adjustment. If so directed by the Engineer-in-charge, the Contractor shall prepare composite working drawings and sections to 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, and it is cause for any interference with the work of other trades, he shall make all the necessary changes without extra cost.

2.5.7. All shop drawings and detail drawings will be made as per requirements of local authorities and tender drawings incorporating all latest regulations and requirements. No separate drawings will be, issued for making shop drawings.

2.5.8. Contractor shall submit shop drawings of Electrical & ELV services in the following manner:

- Floor layouts (where furniture & false ceiling must be inserted) indicating light fixtures, switches, small power layouts (Raw & UPS) etc. All items must be numbered and separate identification marks must be given for raw & UPS power services.
- Distribution board schedule mentioning circuit number, wire size of circuit, quantity of items, room/location of circuit being fed, connected load of circuit, DB location, incoming cable size, total connected load details, incoming & outgoing circuit breaker details etc.
- For lighting & small power, separate layouts shall be submitted.
- Conduit layout shall be submitted separately for each services.
- Mounting heights of all items must be clearly indicated in the layouts.
- Cable route & size, cable tray route & dimensions etc. between DBs & panel boards shall be marked for each services in the layout.
- Position of floor electrical panels shall be marked in the layouts.
- Main single line diagram of electrical system shall be submitted. Main SLD shall provide arrangement of power intake, details of connected load, details of HT panel, transformers, DG set, Electrical panels, UPS, Cable size, etc.
- Site plan of external electrical services showing location of Substation, DG set, FP/DP structure, HT cable route, street lights, LT cable route etc. shall be clearly marked in the layout. Trench dimensions, dimensions of equipments, clearance between equipments/wall etc.
- Electrical earthing layout showing position of earth pits, earth conductor route
- Lightning protection system layout showing position of air terminal, horizontal conductor, down conductor, earth pit location etc.
- Floor layouts indicating position of ELV items CCTV cameras, speakers, Fire alarm devices, telephone outlets, data outlets, etc.
- Riser diagrams of CCTV, Public address, Fire alarm, telephone system, data system, etc.

- Coordination drawing shall be prepared by the contractor. All services above & below false ceiling must be inserted in the latest false ceiling layout. The layout shall clearly indicate all dimensional details of various equipments/services. Sectional details must be prepared where all services coincide at many places.
- A coordination drawing shall be prepared for external services also by inserting electrical, HVAC, water supply, drainage, firefighting, internal roads in the site plan. Sectional details must be prepared to provide dimensional details.

### **3. Disruption of Progress**

3.1. The Contractor shall give 4 weeks, in advance, written notice to the Engineer-in-charge whenever planning or progress of the Works is likely to be delayed or disrupted due to non- issue of any drawing or order by the Engineer-in-charge. The notice shall give details of the drawings or order required explaining why and by when it is required and if any delay or disruption is likely to be suffered on that account.

3.2. If by reason of any failure or inability of the Engineer-in-charge to issue drawings/ order/ clarifications within 4 weeks of such notice by the Contractor and the contractor suffers delay, then the Engineer-in-charge, shall record the facts for any extension of time under respective clause of the agreement. Notwithstanding anything stated above, the Contractor shall not be eligible for any financial compensation arising due to any delay.

3.3. No compensation and/ or interest arising out of that, whatsoever shall be payable to the contractor for any damage by rains, lightening, wind, storm, floods, tornadoes, earthquakes, or any other natural calamities during execution of work and no claim on this account will be entertained for such damages.

### **4. Contractor's General Responsibilities**

#### **(a). Execution of works:**

The Contractor shall, subject to the provisions of the Contract, and with due care and diligence, execute and complete the Works & remedy any defects therein in accordance with the Contract. The Contractor shall provide all labour, including the supervision thereof, materials, Constructional Plant and Machineries and all other things, whether of a temporary or permanent nature, required in and for such execution, completion, maintenance and remedying of any defects, so far as the necessity for providing the same is specified in or is reasonably to be inferred from the Contract.

If the contractor finds any discrepancy in the drawings or between the drawings, bill of quantities and specifications, he shall immediately and in writing refer the same to the Engineer - in- Charge for clarifications who shall decide the matter.

The successful contractor is bound to carry out any items of work necessary for the completion of the job even though such items are not included in the bill of quantities and rates instructions in respect of such additional items and their quantities will be decided as per the provision of the contract and issued in writing by the Engineer-in-charge.

The Contractor must bear in mind that all the work shall be carried out strictly in accordance with the specifications as given in these documents and also in compliance of the requirements of the local public authorities and to the requirements/ satisfaction/ direction of the Engineer-in-charge and no deviation of any account will be permitted.

The contractor shall have to use materials from the makes / manufacturers specified in the list of materials of approved brand and/or manufacture contained in the contract documents and as approved by the Engineer - in- Charge. Wherever different pattern/ Design/ Quality of materials with same specification/ make as specified in the contract, is available in the market, Engineer-in-Charge will approve the pattern/ Design/ Quality of the material/ item which shall be final and binding on the contractor. The contractor shall supply samples of all the materials/ fittings/ fixtures proposed to be

used in the work and obtain approval of the Engineer - in- Charge. These samples shall be retained at site till completion of the work. If subsequently it is found that approved material upon testing does not meet the requirement as specified in the contract the contractor shall get approval of alternate material.

(b). Samples & Approval of Materials

- i. The Engineer-in-charge will not supply any materials required for execution of the Works under this Contract. The Contractor must, therefore, make his own arrangements for timely procurement of various materials including steel and cement.
- ii. Prior to ordering any equipment/ material/ system, the Contractor shall submit to the Engineer-in-charge the catalogues, along with samples from approved list of manufacturers. No material shall be procured without written approval of the Engineer- in-charge.
- iii. Prior approval of each and every material including steel cement, aggregate, bricks etc or any other fittings & fixtures shall be taken by the contractor from the Engineer-in- charge. Samples for all the materials to be used in the work shall be got approved from Engineer-in-charge before their bulk procurement. Samples approved shall be kept in the sample room till the completion of the work.
- iv. All materials used on the Works shall be new and of the approved quality and make available, conforming to the relevant specifications of the contract. Prior approval shall be obtained in writing from the Engineer-in-charge for all materials proposed and when necessary, approved samples duly identified and labeled shall be deposited with the Engineer-in-charge and shall be kept in the sample room at Site. List of approved make indicates make/ manufacturer generally acceptability. Final choice of make/ manufacturer of material & models shall be with the Engineer-in-charge.

(c). Material and Equipment

- i. All material and equipment shall conform to the relevant Indian Standards and bear IS marking where ever applicable.
- ii. Where interfacing is involved, both equipments shall be mutually compatible in all respects.
- iii. Where an item of equipment, other than as specified or detailed on the drawings ,is approved by Engineer-in-charge, requires any re-design of the structure, partitions, foundation, piping, writing or any other part of the mechanical, electrical or architectural layout, all such re-design, and all new drawings and detailing required therefore, shall be prepared by the Contractor at his own expense and approval obtained from the Engineer-in-charge.
- iv. All similar equipment, materials, removable parts of similar equipment etc. shall be inter-changeable with one another.

(d). Approved makes for materials and vendor list

The contractor shall procure materials amongst the vendors as mentioned in the approved make lists enclosed with Volume IV. In case a material is not available from any of the vendors in the enclosed vendor lists, the contractor may intimate and submit details of source from where the contractor wishes to procure the material, along with complete details and the particular material shall be got approved from the Engineer - in- Charge before procurement.

(e). Safety in Construction

The contractor shall employ only such methods of construction, tools and plant as are appropriate for the type of work or as approved by Engineer-in-Charge in writing.

The contractor shall take all precautions and measures to ensure safety of works and workmen and shall be fully responsible for the same. Safety pertaining to construction works such as excavation, HITES/IDS/22/27- Vol. III



centering and shuttering, trenching, blasting, demolition, electric connections, scaffolds, ladders, working platforms, gangway, mixing of bituminous materials, electric and gas welding, use of hoisting and construction machinery shall be governed by the Safety code, relevant safety codes and the direction of Engineer-in-Charge.

(f). Adequacy, stability and safety:

The Contractor shall be fully responsible for the adequacy, stability and safety of all site operations and methods of construction, the contractor shall ensure that all safety norms are followed as per contractual and other statutory requirements.

(g). Temporary works and arrangements:

The Contractor shall furnish to the Engineer-in-charge full particulars i.e. site location and area required including drawings, etc. of all temporary works necessary for the execution of the works and shall give adequate time to the Engineer - in- Charge for his approval. The Contractor shall be solely responsible for the stability and structural safety of all temporary works including obtaining statutory approvals and payment of statutory fees, if any. Should it be necessary to shift the temporary works to some other place during the execution of the works, the Contractor shall do so, at his own cost.

(h). Initial and Final Clearance of site for temporary works:

The Contractor shall be responsible for the clearance of the site of all scrub, debris, rubbish, etc. to be removed off site to a location to be provided by the contractor and approved by the Engineer- in-charge. However, no trees shall be removed without the prior permission of the Engineer-in-charge. The structures, services and works required to be demolished and removed shall also be removed off site to a location as mentioned above. The Contractor shall obtain necessary permissions and approvals from the local authorities for such disposals. The demolition shall include digging, excavating and removal of substructures, foundations and buried works. The cost of all this shall be included in the rates quoted by the Contractor.

The above is applicable for all site offices, labour camps, and godowns etc., which are not required after the work is completed.

(i). Storage, Cleaning and Dewatering

The Contractor shall at all the times during construction keep the Site clean and free from all debris and unwanted materials on a daily basis as per instructions of the Engineer-in-charge.

Storage of materials shall be in an organized manner and in proper compartments as directed by the Engineer - in- Charge. Storage on suspended floors shall not be permitted unless specifically approved in writing by the Engineer-in-charge for specific materials in specific locations and in approved manner. The Engineer-in-charge shall be furnished with load details, if requested, before seeking approval for storage.

Regular cleaning operations shall be undertaken to remove all dust, debris, waste materials etc. A cleaning schedule shall be maintained.

The Contractor shall make his own arrangement for storage of those materials, which can be accommodated at site. Contractor shall be fully responsible for safe custody of the same. Materials shall be considered as “Delivered at Site” only after the physical presence of materials at site are verified by the Engineer-in-charge. Storage of materials/ equipment elsewhere shall not be considered as “Delivered at Site.”

The Contractor shall be responsible to keep entire site free from water due to water coming from any source at any level and shall protect all materials and works from being damaged by the water from any source. Contractor shall make proper arrangements for drainage prior to use of water for curing, testing, cleaning etc.

Any expenditure incurred by the Contractor in fulfillment of his obligations under this sub-clause shall be deemed to have been included in the financial bid and subsequent contract.

**5. Watch & Ward and Lighting**

The Contractor shall throughout the execution and completion of the Works and the remedying of the site and the Works and the remedying of any defects therein have full regard for the safety of all persons entitled to be on the site and keep the site and the Works in an orderly state to avoid any accident or danger and provide safety measures, lights, guards, fencing and barricades where ever necessary or required by the Engineer-in- charge, or by any duly constituted authority, for the execution and for the protection of the Work, and/or for the safety and convenience of the public or others and take all reasonable steps to protect the environment on and off the site and to avoid damage or nuisance to person or property of the public or others resulting from pollution, noise and other causes etc. at his own cost.

#### **6. Care of Works**

From the commencement to the certified completion of the whole of works, the contractor shall be responsible for the care, safety and maintenance of the works executed under the contract thereof and of all temporary works. In case of any damage/ loss or injury shall happen to the works or to any part thereof or to any temporary works from any cause whatsoever save and except the expected risks, the contractor shall at his own cost repair and make good the same, so that on completion the works shall be in good order and condition in conformity to every respect with the requirements of the contract. The contractor shall also be liable for any damage to the works occasioned by him including his subcontractors in the course of any operations carried out by him for the purpose of completing any outstanding work and complying with his obligations under the Contract. In case of failure on the part of the contractor the damage/ loss/ injury shall be made good by the HITES at the risk and cost of the contractor.

#### **7. Force Majeure:**

Any failure or delay in the performance by either party hereto of its obligations under his Contract shall not constitute a breach thereof or give rise to any claims for damages if, and to the extent that it is caused by occurrences beyond the control of the party affected, namely, acts of God, floods, explosions, wars, riots, storms, earthquakes, insurrection, epidemic or other natural disasters. The party so affected shall continue to take all actions reasonably within its power to comply as far as possible with its obligations under this Contract. The affected party shall promptly notify the other party after the occurrence of the relevant event and shall use every reasonable effort to minimize the effects of such event and act in all good faith with due care and diligence.

#### **8. Contractor's Superintendence**

(a). The contractor shall be solely responsible for the means, methods, techniques sequence and procedure of construction. The Contractor shall be responsible to see the completed work complies accurately with the Contract requirements. The Contractor shall provide all necessary superintendence during the execution of the Works as per contractual provisions.

#### **(b). Contractor's Representative for Execution & Coordination of Works**

The Contractor shall ensure his presence at site all times during working hours throughout the course of the Contract or depute a Competent representative who shall be empowered to receive instructions from the Engineer - in- Charge in respect of all matters likely to arise in connection with the execution & coordination of the works at the site. Contractor's Authorized Representative shall take joint measurements and sign the measurement books / bills. Any direction, explanations, instructions or notices given by the Engineer-in-charge to such representative shall be held to be given to the Contractor. In case of absence of said Representative other alternative representative should also be mentioned having same responsibilities.

**The contractor should submit curriculum vitae (CV) of the key personnel proposed to be deployed at site as per Schedule "F" of GCC for supervision and execution of work.**

**The contractor under normal circumstances would not be allowed to replace the key personnel during the execution of the contract.** However, for any reasons, due to unavoidable circumstances  
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if it becomes necessary in the interest of the project to replace any one / all the above key personnel the contractor must submit the CV of the new personnel (having qualifications and experience as per requirement of the contract) to Engineer-in-Charge for their approval.

A list of all technical and key personal staffs must be submitted to the Engineer- in-Charge with their area of work/ responsibility with verified signature and the link persons to receive the instructions at site (in case the main person was not found at site) during the inspection by representative of Engineer- in-charge. Any staff of contractor found incapable/unsuitable to execute the assigned work shall be replaced by the Contractor if desired by the Engineer-in-Charge.

(c). Contractor's Employees

The Contractor shall employ competent Engineering staff/ technical assistants/ technicians who are qualified, skilled and experienced in their respective trades, to ensure proper supervision, quality & output of the work they are required to supervise. No child labour shall be employed on the work. All the skilled semi-skilled and unskilled labour shall work under the sole guidance of the contractor/his representative.

(d). Removal of Contractor's Employees

The Contractor shall on the direction of the Engineer-in-Charge immediately remove from the work any person employed thereon by him who may, in the opinion of the Engineer-in-Charge has misconducted himself and such person shall not be again employed on the works without the permission of the Engineer-in- charge.

(e). Unauthorized Persons

No unauthorized persons shall be allowed on the site. The contractor shall provide complete security arrangement for the campus during construction to avoid trespassing. The Contractor shall ensure all such persons are kept out and shall take steps to prevent trespassing. However the contractor will make sure to provide free access at any time for Engineer-in-charge to the site and other working places.

**9. Compliance with Statutes, Regulations, Etc.**

The contractor shall conform to the provisions of all statutes, ordinance, laws, acts of the legislature relating to the works, and to the regulations and by-laws of any local or other duly constituted authority and of any water, electric supply and other companies and/or authorities with whose systems the structure is proposed to be connected. The Contractor shall keep the HITES indemnified against all fines or penalties or liability of every kind for breach of any such statutory ordinance, law act of the legislation, regulations, and bylaws as aforesaid.

The contractor shall before making any variations from the drawings or specifications that may be necessitated by such regulations, give to the Engineer- in-charge written notice, specifying the variation proposed to be made and the reasons for making it and apply for instructions thereon. The contractor will not execute any work without written permission from the Engineer-in- charge

The contractor shall bring to the attention of the Engineer-in-charge any specific requirement of the local authorities or any notice required for execution by virtue of such acts, regulations or bye-laws of such authority, or public office. All fees that may be chargeable in respect of these works shall be reimbursed by the HITES on production of authorised receipts.

**10. Setting out**

The contractor shall be responsible for the true and proper setting-out of the Works in relation to original points, lines and levels or reference issued by Engineer-in-charge in drawing or in writing and for the correctness, subject as above mentioned, of the position, levels, dimensions and alignment of all parts of works and for the provision of all necessary instruments, appliances and labour in connection therewith. If, at any time during the progress of the works, and during defects liability period, any error shall appear or arise in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required to do by the Engineer-in-charge and/ or his authorised

representative shall at his own cost, rectify such error to the satisfaction of the Engineer-in-charge. The checking of any setting out or of any line or level by the Engineer-in-charge not in any way relieve the Contractor of his responsibility for the correctness thereof. The Contractor shall carefully protect and preserve the benchmarks; sight-rails, pegs and other things used in setting-out the Works. Any rectification works required should be done by the Contractor at his own cost.

#### **11. Quality of Materials, Workmanship and Test**

(a). All the materials used in the work shall be subjected to the mandatory tests as prescribed in the specifications detailed in Schedule F of the General Conditions of Contract and other specifications referred to in the contract and workmanship shall be the best of the respective kinds described in the Contract and in accordance with the Engineer-in-charge's instructions and shall be subjected from time to time to such tests as the Engineer-in-charge may direct at the place of manufacture or fabrication or on the Site or at an approved testing laboratory. The source of supply and/ or manufacturing within/ outside India may be inspected by the Engineer-in-charge or any representative as nominated by the HITES. The expenditure on this account is deemed to be included in the rate quoted.

The contractor shall upon the instruction of the Engineer-in-charge's representative furnish him with documentation to prove that the materials & goods comply with the requirements of contract and for requirement stated above. The Engineer-in-charge may issue instruction in regard to removal of material from site or any work, if these are not in accordance with the contract. The contractor shall provide such assistance, instruments, machinery, labour and materials as are required for examining, measuring, sampling, testing of material or part of work.

The Engineer-in-charge may carry out **Third Party Quality Assurance /Audit by an independent agency/ individual/firm/institute** at any time appointed by Client / HITES. The agency will be permitted and offered all support related to site inspection by the contractor. Observations/ discrepancies noticed by third party quality assurance/audit shall be attended by the contractor at his own cost and compliance report to be submitted to the Engineer-in-charge. No compensation and /or any interest arising out of that shall be payable due to any delay during the technical audit till receipt of satisfactory report from the audit agency which shall be a pre-requisite for release of final bill payments.

In addition to the above, technical inspection team of HITES/CLIENT shall conduct site inspection during the progress of work. The observations/modifications/repairs instructed by HITES/CLIENT shall be done by the contractor at his own cost. The contractor is also bound to do the tests as per the direction of HITES/CLIENT at his own cost.

#### **(b). Samples**

i) All samples of materials and/or items of works in adequate numbers, sizes, shades & pattern as per specifications shall be supplied free of charge by the contractor without any extra charge. All other expenditure required to be incurred like conveyance for taking the samples for testing at the laboratory, packing, etc, shall be borne by the contractor. If the test results do not conform to the specifications and standards laid down, the materials shall be rejected, the contractor shall remove such materials from site. The laboratory for testing of samples shall be decided by the Engineer – in charge, whose decision shall be final and binding. A register shall be maintained for the materials brought to site, tested and test results shall be recorded and verified by Engineer-in-charge.

ii) Contractor shall submit Samples to the Engineer-in-charge for approval. If certain items proposed to be used are of such nature that samples cannot be presented or prepared at the site, detailed literature/ test certificate of the same shall be provided to the satisfaction of the Engineer-in-charge. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalogue numbers and the use for which intended and otherwise as the Engineer-in-charge may require to review the submittals for the limited purposes required by paragraph (d) below. The numbers of each sample to be submitted will be as specified in the Specifications, or as shall be

specified by the Engineer-in-charge. Material approved by Engineer-in-charge shall be recorded by the contractor in a register and the same shall be certified / verified by Engineer-in-charge

iii) Submittal Procedures

1. Before submitting each Sample, Contractor shall have determined and verified all materials with respect to intended use, fabrication, shipping, handling, storage, assembling and installation pertaining to the performance of the Work and All information relative to Contractor's sole responsibilities in respect of means, methods, techniques, sequences and procedures of construction and safety precautions and programmes incident thereto.
2. Each submittal will bear a specific written indication that Contractor has satisfied Contractor's obligation under the Contract Documents with respect to Contractor's review and approval of that submittal.
3. At the time of each submission, contractor shall give the Engineer-in-charge specific written notice of such variations, if any; that the sample submitted may have from the requirements of the contract document. Such notice shall be separate from the submittal and in addition shall cause a specific notation to be made on each sample submitted for review and approval of each such variation

iv) Review and Approval:

1. Sample shall be reviewed and approved only to determine if the items covered by the submittals will, after installation or incorporation in the work, conform to the information given in the contract documents and be compatible with the design concept of the completed project functioning as a whole as indicated by the contract documents, drawings.
2. Review and approval will not extend to means, methods, techniques, sequences or procedures of construction. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. Contractor shall make corrections required by Engineer-in-charge and shall submit as required new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for and by the Engineer-in-charge on previous submittals.
3. Above referred review and approval of Samples shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Document unless Contractor has in writing called the Engineer-in-charge attention to each such variation at the time of submission as specified above and received written approval of each such variation by specific written notation thereof incorporated in or accompanying the Sample approval; nor will any approval by Engineer-in-charge relieve Contractor from responsibility for complying with the requirements of contract.
4. Only when the samples are approved in writing by the Engineer-in-charge, the contractor shall proceed with the procurement and installation of the particular material/ equipment. The approved samples shall be signed by the Engineer-in-charge for identification and shall be kept on record at site office until the completion and acceptance of the work and shall be available at the site for inspection / comparison at any time. The contractor shall keep with him a duplicate of such samples to enable him to process the matter.
5. For items of works where the samples are to be made at the site, the same procedure shall be followed. All such samples shall be prepared at a place where it can be left undisturbed until the completion of the project.
6. The Engineer-in-charge shall communicate his comments/ approval to the Contractor to the samples at his earliest convenience. Any delay that might occur in approving of the samples for reasons of its not meeting with the specifications or other discrepancies, inadequacy in furnishing samples of appropriate quality from various manufacturers and such other aspects causing delay on the approval of the materials/ equipment's etc., shall be ascribable to the account of the contractor. In this respect the decision of the Engineer-in-charge shall be the final.

v) On delivery of the supplies of materials/ equipments for permanent works at the site, the contractor shall specifically arrange to get the supply inspected by the Engineer-in-charge and compared with the approved sample and his specific approval obtained before using the same in the work.

vi) Cost of Tests

The cost of making any test shall be borne by the Contractor as intended by or provided for the Contract or as found necessary by the Engineer-in-charge for ascertaining whether the quality of materials intended to be used by the Contractor in the Works is acceptable, whether any finished or partially finished work is appropriate for the purposes for which it was intended to fulfill.

vii) Testing facilities

The Contractor shall, at his own cost, provide testing facilities as per CPWD specifications and IS Codes at site as stipulated in the General conditions of the contract (GCC) or as directed by the Engineer-in-charge including staff required for testing. The tests shall be carried out jointly in the presence of Engineer-in-charge or his representative and the contractor or his representative.

The contractor shall also provide suitable weighing and measuring arrangement and testing instruments and machines for testing of materials and cubes at site as per details given in GCC.

The contractor shall carryout all the mandatory tests and shall maintain records of testing & checks of material, in formats, checklists etc. to be given by Engineer-in-charge. All such records shall be maintained jointly by the contractor and Engineer-in-charge these shall remain under the custody of the Engineer-in-charge.

The laboratory shall be connected to the main potable water, electricity and other Services.

Some of the mandatory tests for each item of work and /or materials shall be carried out in approved outside laboratory as directed by the Engineer-in-charge. The Contractor shall bear the entire cost of testing charges for samples of items of work and /or materials and also the other expenditure towards making samples, packaging, and transport etc.

The materials brought at site of work shall not be used in the work before getting satisfactory test result as per relevant mandatory tests, detailed in the relevant CPWD specifications and BIS codes or as per directions of EIC.

## **12. Absence of Specifications**

If the nomenclature of any item does not contain particulars of materials and works which are necessary for its proper execution, all such materials shall be supplied and item shall be executed by the Contractor without extra charge over the quoted rates and If the Contractor requires any information, he shall request in writing well in advance to commencement of the particular work to the Engineer-in-charge who will clarify the issue within a reasonable time.

## **13. Obtaining Information's related to Execution of work**

No claim by the Contractor for additional payment will be entertained which in consequent upon failure on his part to obtain correct information as to any matter affecting the execution of the works, nor will any misunderstandings or the obtaining of incorrect information or the failure to obtain information relieve him from any risks or from the entire responsibility for the fulfillment of the contract.

## **14. Access for Inspection**

Persons nominated by Engineer-in-charge shall at all reasonable times have free access to work and/ or to the workshops, factories or other places where materials are lying or from which they are being obtained and the Contractor shall extend necessary service to Engineer-in-charge and their representatives every facility necessary for checking measurements, inspection and examination and test of the materials and workmanship.

**15. Examination of Work before covering up**

(a) No part of the works shall be covered up or put out of view without the written approval of the Engineer-in-charge and the contractor shall give due notice to the Engineer-in-charge whenever any such work or foundation is or ready or about to be ready for examination and the Engineer-in-charge shall, examine and measure any work before it is covered up or put out of view and to examine foundations before further work is placed thereon.

**(b) Uncovering and making openings**

The contractor shall uncover any part or parts of the works or make openings in or through the same as the Engineer-in-charge may direct from time to time and shall reinstate and make good such part or parts to the satisfaction of the Engineer-in-charge at his own cost.

**16. Assignment**

The contractor shall not, without the prior consent of the Engineer-in-charge assign the Contract or any part thereof, or any benefit or interest therein or there under, otherwise than by:

- A change in favour of the Contractor's bankers of any money due or to become due under the Contract, or
- Assignment to the Contractor's insurers (in case where the insurers have discharged the Contractor's loss or liability) of the Contractor's right to obtain relief against any other party liable.

**The Contractor shall not sub-contract the whole of the Works. Also, the Contractor shall not subcontract any part of the works without the prior consent of the Engineer-in-charge, except where otherwise provided under the Contract.** Any such consent shall not relieve the Contractor from any liability or obligation under the Contract and he shall be fully responsible for the quality of the work executed and acts, omission and commission, defaults and neglects of any Subcontractor, his agents, servants or workmen as if these were the acts, defaults or neglects of the Contractor, his agents, servants or workmen. Such Permission may be granted only for the specialized work etc and the decision of Engineer-in-charge shall be final.

**17. Claims**

The contractor shall submit to the Engineer-in-charge monthly statement giving full details of claims for any additional payments for extra or additional / substituted work ordered by the Engineer-in-charge which he has executed during the preceding month, to which the contractor may consider himself entitled supported with analysis of rates being claimed failing which the contractor shall be deemed to have waived his right. The Engineer-in-charge may authorize consideration of such claims on merits on production of sought out documents/ vouchers etc.

**18. Secured Advance**

I. Secured advance on materials, which are admissible as per **Clause 10 (B) (i)** of the General Conditions of Contract and brought to site for use in the work, shall be paid only after the Engineer in charge has personally verified that the material brought at site of work for use in the work conforms to the specifications/sample approved by him.

II. Secured advance shall be recovered according to consumption of material in the work. Contractor shall have to sign an Indenture Bond (on a non-judicial stamp paper of appropriate value) as per proforma provided in GCC before release of the advance.

III. The materials shall virtually stand Hypothecated to HITES but contractor shall be fully responsible for watch & ward/ security of materials for which Secured Advance has been paid by HITES.

IV. Any infringement and / or breach of the above specifications and conditions etc, shall render the contractor liable to action under various clauses of the contract and such action as

stipulated in the conditions therein.

19. (a) Inspection & Testing during manufacture

The Engineer-in-charge shall be entitled to inspect, examine and test during manufacture the materials and workmanship and check the progress of manufacture of all fabrication materials to be supplied under the contract on the contractor's premises during working hours, and if part of the said materials is being manufactured on other premises, the contractor shall obtain for the Engineer-in-charge permission to inspect the same at such premises. This inspection, examination or testing shall not relieve the contractor from any obligation under the contract.

(b) Dates for Inspection & Testing

The dates of Inspection & Testing, after receipt of written request by the Contractor, shall be mutually agreed by the Engineer-in-charge and the contractor.

(c) Facilities for Testing at Manufacturer's Works

Where the contract provides for tests on the premises of the contractor or of any sub-contractor the contractor shall provide such assistance, labour, materials, electricity, fuel, stores, apparatus and instruments as may be required and as may be reasonably demanded to carry out such tests.

(d) Rejection

If as a result of such inspection, examination or test of the works (other than a Test on Completion) the Engineer-in-charge shall decide that such material is defective or not in accordance with the contract he shall notify the contractor accordingly stating in writing his observations and reasons thereof. The contractor shall with due diligence make good the defect and ensure that the material complies with the Contract. Thereafter, if required by the Engineer-in-charge, the tests shall be repeated under the same terms and conditions till satisfactory results are made available.

(e) Delivery of Materials and Equipment

The contractor shall be responsible for all materials and equipment brought at site for the purposes of the contract. Unless the Engineer-in-charge directs, no material shall be brought to the site which is not required for execution of the work.

(f) Inspection & Testing and Re-inspection

All deficiencies revealed by testing and inspection shall be rectified by the contractor at his own expense and to the satisfaction and approval of the Engineer-in-charge. Rectified components shall be subject to re-testing till desired results are obtained.

(g) Inspection Reports

The contractor shall provide the Engineer - in- Charge with five copies of reports of all inspection and tests.

**20. Physical and Virtual Completion of Work**

When the whole of the Work is physically and virtually complete and has satisfactorily passed required tests that may be prescribed under the Contract:-

a) The contractor shall give a written notice to this effect within 10 days of completion along with an undertaking to rectify any defects that may be found during inspection. The Engineer - in- Charge shall jointly inspect the work with the contractor within 30 days of receipt of such notice.

b) The Engineer-in-charge shall inspect the works completed to see if they are in such a condition so as to be put to its proper or other intended final use and / or occupied without any short comings and no major or minor items of works are remaining which in the opinion of the Engineer-in-charge will cause undue difficulties in satisfactory use/ occupation of the works.



**21. Provisional Acceptance and Certificate of completion****3.1. Provisional Acceptance and Issue of Certificate of Physical Completion of work**

The work shall be deemed to have been physically completed and provisionally accepted after fulfillment of all the following by the Contractor.

- i) Physical completion of all works and obtaining all required approvals from the statutory authorities as required for occupation and use of the works and handing over such certificates to the Engineer-in-charge
- ii) Submitting As-Built Drawings, Catalogues, Brochures, and Data Sheets, manuals in the form as directed by Engineer in Charge
- iii) Issue of Certificate of Physical Completion by the Engineer-in-charge as specified in clause 8 of GCC.

**3.2. Certificate of Final Completion**

The contract shall not be considered as completed until a Certificate of Final Completion has been issued by the Engineer-in-charge stating that the Works have been completed to his satisfaction and / rectifying of defects have been satisfactorily completed.

The composite work shall be treated as complete when all the components of the work are complete. The Certificate for Final Completion of the Composite work shall be recorded by the Engineer-in-charge after obtaining/ recording of completion certificate of all the components.

The Engineer-in-charge shall give the Certificate for Final Completion ON FULFILMENT OF FOLLOWING:

- Contractor has rectified all defects noticed by the Engineer –in –charge and as specified in the Provisional completion certificate.
- Contractor shall have removed from the premises on which the work is executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works
- Cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is executed or of which he may have had possession for the purpose of the execution.

Provided always that the issue of the Certificate of Final Completion shall be a condition precedent to payment or return to the Contractor the security deposit and/ or Performance security in accordance with the conditions set out in the contract.

22. The contractor shall give performance test of the entire work as per standards specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the tests.

23. The contractor shall maintain in perfect condition all works executed till the completion of the entire work allotted to him. Where phased handing over of completed portion of the work is required by the Engineer – in – charge, the provisions mentioned for completion of entire work will apply to each phase.

**24. Defect after completion****(a). General**

Any defect, shrinkage, settlement or other faults that may appear within the “Defects Liability Period” which in the opinion of the Engineer-in-charge are due to materials or workmanship not in accordance with the contract, shall be rectified as per the directions in writing of the Engineer-in-charge to the Authorized representative of the contractor within such reasonable time as shall be specified therein by the contractor, at his own cost. In case of default, the Engineer-in-charge may employ any person’s to amend and make good such defects, shrinkage, settlements or other faults and

all expenses consequent thereon or incidental thereto shall be borne by the contractor. Such damages, losses and expenses shall be recoverable from the bills due or may be deducted from any money due to or that may become due to the contractor. If no amount is available to the credit of contractor, the Engineer-in-charge may recover the amount from the dues of the contractor from any other contract made by the Contractor with the Engineer-in-charge with any government/ department.

**(b).**

Any defects, shrinkage, settlement or other faults which may appear or be noticed within the defect liability period, and arising in the opinion of the Engineer-in-charge from materials or workmanship not having in accordance with the contract, shall upon the direction in writing of the Engineer-in-charge's representative and within such reasonable time as shall be specified therein and without any delay, be amended and made good or replaced by the contractor at his own cost.

**(c). Cost of Execution of Work of Repair, Etc.**

All such works shall be carried out by the Execution of work of repair etc. Contractor at his own expense if the necessity thereof shall, in the opinion of the Engineer-in-charge, be due to the use of materials or workmanship not in accordance with the Contract, or due to neglect or failure on the part of the Contractor to comply with any obligation, expressed or implied, on the Contractor's part under the Contract

**(d). Contractor's personnel to be at site**

During the defects liability period the contractor shall depute at least one of his authorized representative at site along with required tradesmen to attend the defects to the satisfaction of Engineer-in-charge.

**25. Works by Other Agencies**

The Engineer-in-charge reserves the right to use premises and any portion of the site for the execution of any work not included in this contract which it may desire to have carried out by other persons simultaneously, and the contractor shall allow the reasonable facilities for the execution of such work, but shall not be required to provide any plant or material for the execution of such work except by special arrangement with the other agency. Such work shall be carried out in a manner so as not to impede the progress of the works included in the contract, the contractor shall not be responsible for any damage or delay which may happen to or occasioned by such work.

The contractor shall co-operate with other agencies working in the same project, and coordinate his plans and time schedules so that there will be no interference. The Contractor shall forward to the Engineer-in-charge all correspondences and drawings exchanged. Failure to check plans for conditions will render the Contractor responsible for bearing the cost of any subsequent changes found necessary or damages done.

The Engineer-in-charge shall not entertain any claim on account of the Contractor affording necessary facilities to execute the work simultaneously with other agencies executing the works for the same project. Delay in execution attributable due to other agency works engaged by Client / HITES shall have to be intimated by the contractor immediately on occurrence and only extension of time shall be considered by the Engineer-in-charge based on the merits of the request and no additional compensation and /or interest shall be payable.

**26. Dues not paid by the Contractor**

The contractor shall pay all dues or fees to Statutory authorities and Electric and Water supply authorities etc. within due period and indemnify the HITES and the Engineer-in-charge from any claims or compensations or penalties or damages arising out of non- payment of any such dues or fees. However, in case some dues or fees are not paid by contractor and or claims for compensations or penalties etc. are raised by the Statutory authorities, the HITES may deposit the required amount or any or all of the above and recover or deduct the same from any money payable to the contractor by the HITES or any other means available to the HITES such as bank guarantee.

**27. Urgent Repairs**

If, by reason of any accident, or failure, or other event occurring to or in connection with the works, or any part thereof, either during the execution of the works, or during period of Defects Liability any remedial or other work or repair, shall, in the opinion of the Engineer-in-charge be urgently necessary for the safety of the Works and the Contractor is unable or unwilling to do such work or repair despite notice, the Engineer-in-charge may employ and pay other persons to carry out such work or repair as the case may be and may consider necessary. If the work or repair so done by the other agency is the work which, in the opinion of the Engineer-in-charge the Contractor was liable to do at his own expense under the Contract, all expenses incurred by Other agency in so doing shall be recoverable from the Contractor by the Engineer-in-charge, or shall be deducted by the Engineer-in-charge from any monies due or which may become due to Contractor.

**28. Boreholes & Exploratory Excavation**

If, at any time during the execution of the Works, the Engineer-in-charge shall require the Contractor to make boreholes or to carry out exploratory excavation, such requirement shall be ordered in writing and shall be deemed to be an additional ordered under the provisions unless a provisional sum in respect of such anticipated work shall have been included in the schedule of items.

**29. Fossils, Etc.**

All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the site of the works shall be the property of the Government.

**30. Plant Temporary Works & Materials**

(a.) Plant etc. Exclusive use for the Works

All Constructional Plant, Temporary Works and materials provided by the Contractor shall, when brought on to the Site, be deemed to be exclusively intended for the execution of the Works and the Contractor shall not remove the same or any part thereof except for the purpose of moving it from one part of the Site to another, without the consent, in writing of the Engineer-in-charge, which shall not be unreasonably withheld.

(b.) Removal of Plant etc.

Upon completion of the Works, the Contractor shall remove from the Site all the said Constructional Plant and Temporary Works remaining thereon and any unused materials provided by the Contractor, within 10 days of obtaining the completion certificate/ Virtual completion of the work.

**31. Reports by Contractor**

(a.) The Contractor shall submit **detailed programme schedule in MS Project or any in any other software as decided by E-I-C**, indicating the duration of each item of the work, for the complete work within 25 days of award of work or as per Clause 5 of the GCC, whichever is earlier, for approval by the Engineer - in- Charge. On the basis of approved programme schedule contractor shall submit Progress Charts by the 5th day of every month. Soft copy of schedule shall be supplied whenever demanded by the Engineer-in-charge. It shall be noted that the payment for the work will be released based on the target date set in the schedule.

**(b.) In case progress as scheduled in the construction programme is not achieved on the target date for stage payment due to occurrence of deviation in items or delay in execution, the programme schedule may be revised in advance as instructed by Engineer in charge and as per clause 5 of GCC. The revision in programme schedule shall be intimated to Client/HITES prior to the target date otherwise the payment will be released along with the next stage of payment only.**

(c.) The Contractor shall submit Monthly Progress Report in triplicate in format approved by Engineer- in-charge. Failure to submit reports may result in holding up or delay in Payment of bills.

(d.) **Monthly Progress Photographs:-** The Contractor shall arrange at his own cost to maintain a progress record of the works by taking postcard size colour photographs (preferably digitized photographs) 6 Nos. or more per month per block as directed by the Engineer-in-charge during the construction stages and after completion shall supply three sets at no extra cost. The Contractor will be required to submit monthly reports on the progress of his work as per the format approved by the Engineer-in-charge.

(e.) The Contractor shall prepare Weekly Reports of planned and actual progress of work and subsequent week's scheduled work. These will also include material procurement status. These reports shall be submitted to the Engineer-in-charge & shall be reviewed in Weekly Co-ordination Meetings.

(f.) The Contractor shall file daily category-wise labour report to the Engineer-in- charge. The report shall indicate scheduled requirement against actual strength.

(g.) The contractor shall maintain daily weather record. Daily maximum and minimum temperature and corresponding, humidity shall be recorded and charted. Rainy days shall be recorded when the rain lasting more than one hour hampers the work. Any other inclemency in weather shall be recorded. The records shall be regularly shown to the Engineer-in-charge and his signature obtained.

32. Every care has been made to include all the aspects/ terms and condition in these documents. However, during execution, if any issue arises, which has not been included in these documents then standard norms / rules & regulations/ terms & conditions as prevalent in CPWD shall be followed which shall be binding on both the parties.

### **33. Audit and Technical Examination**

The HITES/ Engineer-In-Charge/Client shall have the right to cause Audit and Technical Examination of the works and the running account bills and final bills of the contractor including all supporting vouchers, abstracts, records / reports maintained at site etc. to be made as per payments of the RA bill / final bill and if as a result of such Audit and Technical Examination the sum is found to have been overpaid in respect of any work done by the contractor under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over payment and it shall be lawful for the Engineer-in-charge to recover the same from the Security Deposit or Performance Security of the contractor or from any dues payable to the contractor. If it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid without any interest on the amount /due payable.

In the case of any audit examination and recovery consequent on the same the contractor shall be given an opportunity to explain his case and the decision of the Engineer-in-charge shall be final. Payment on this account will be recovered from the contractor.

In the case of Technical Audit, consequent upon which there is a recovery from the contractor, recovery shall be made with orders of the Engineer-in-charge whose decision shall be final. All action under this clause shall be initiated and intimated to the contractor within the period of twelve months from the date of final completion.

### **34. Operations and Maintenance Manual**

The Contractor shall provide and submit to the Engineer-in-charge with three copies of the Operation and Maintenance Instruction Manuals, as may be applicable, for the works in a durable plastic case. The arrangement of these manuals shall be as follows:

SECTION A:	Index
SECTION B:	Full set of Indexed Photographs showing all salient features of the Project.
SECTION C:	Description and details of materials, items and fittings and fixtures used for the project along with Catalogues & Addresses of the Suppliers including operation & maintenance Manuals etc.
SECTION D:	Planned maintenance instructions and dates for order replacements.
SECTION E:	List of recommended Spare parts of consumables.
SECTION F:	List of "As-Built" Drawings (related to Working/ Shop drawings)

Until the Record Drawings, prints, transparencies and manuals referred to above have been received and approved by the Engineer-in-charge, Contract shall not be considered as complete and payment of monies will be withheld until such drawings, etc. have been submitted to and approved by the Engineer-in-charge. The cost of providing such records including proper submission thereof is deemed to be included in the Contract Sum quoted by the Contractor.

### **35. Miscellaneous**

#### (a.) Safety Regulations

Contractor shall be fully responsible for the safety of his Employees/ Visitors / Contract Labour/ Sub-Contractors Labour. The Contractor shall provide first-aid box readily available at site. The Contractor shall provide all safety measures as per labour safety rules applicable.

#### (b.) Labour Laws

The Contractor shall strictly adhere to all labour laws prevailing in the region. The contractor shall make timely payment of wages of his labour and the wages paid to the labour shall be equal to or more than the minimum wage prevailing at the time of payment. The Contractor shall comply with all applicable labour legislation, maintain labour records including payment made to the workers and obtain license for engaging workers for the work as required under the labour laws.

#### (c.) By-Laws of Statutory Authorities

The Contractor and his labour shall not violate municipal /sanitation /health or any other byelaws.

#### (d.) Tax Deduction at Source

All Taxes and surcharge as applicable on date shall be deducted from the amount due to the Contractor towards the value of the work done. TDS certificate thereof shall be issued to the Contractor.

#### (e.) General Lighting and Securities

The Contractor shall, throughout the execution, completion and remedying of the defects, provide and maintain at his own cost all lights, guards, fencing, barricading (up to 3 ms. Height approx.), warning signs and watch post, when and where necessary or directed by the Engineer-in-charge or by any duly constituted authority for the protection, safety and convenience of the workers/ public / or others.

#### (f.) Delay in starting the work

No compensation shall be allowed for any delay caused in the starting of the work on account of acquisition of land, encroachment or in the case of clearance of works, on account of any delay in

according sanction to estimates in issue of drawings, decisions etc. However, the extension of time shall be granted as per relevant conditions of Contract.

(g.) Site instruction book

For the purpose of quick communication between Engineer-in-charge and the Contractor or his representative, site instruction book shall be maintained at site as described below:

Any communication, relating the works may be conveyed through instructions in the site instruction book. Such a communication from Engineer-in-charge to the Contractor shall be deemed to have been adequately served in terms of the contract once the entries are made and signed by the authorized representative of the contractor. For this purpose the contractor should authorize one of his employees on the site itself. Site instruction book shall have machine numbered pages and shall be carefully maintained and remain under custody of Engineer-in-charge. The contractor can also avail of the site instructions book for urgent communication with Engineer-in-charge. Any instruction which Engineer-in-charge may like to issue to the Contractor may be recorded by the Engineer-in-charge in site instruction book.

(h.) Signage

The Contractor shall provide at his own cost, different sign boards at directed location having size as instructed by HITES as per guidelines of HITES/CLIENT indicating name of the project, and a three-D view of the project as well as the name of the Contractor and the HITES with addresses, cost of the Project, date of start & completion, as approved by Engineer-In-Charge. The signboards should be illuminated during night.

(i.) Cutting of Trees: -Permission for cutting of trees, if required, will be obtained by the Contractor from the concerned authority. HITES will provide necessary support in the matter.

(j.) The contractor shall have adequate generators of required capacity as per site requirement as standby arrangement.

(k.) The temporary connection for electric line and water line from local authorities shall be taken by the contractor who will bear the expenditures in this account.

(l.) No idling charges or compensation shall be paid for idling of the contractor's labour, staff or P&M etc. on any ground or due to any reason whatsoever.

(m.) The Contractor shall mobilize and employ sufficient resources for completion of all the works within the stipulated time period as per agreement and as indicated in the approved construction schedule. No additional payment will be made to the contractor for any multiple shift work or other incentive methods contemplated by him in his work schedule even though the time schedule is approved by Engineer-in-charge.

### **36. Co-ordination Meetings**

The Contractor shall be required to attend co-ordination meetings with the Engineer-in-charge/HITES and the other Contractors during the period of Contract as intimated by the Engineer-in-charge/ HITES. All costs incidental to such interaction shall be to the Contractor's account and no claim will be entertained by the Engineer-in-charge/ HITES on this account.

### **37. Site Management:**

#### **37.1 Contractor's Working Area**

Suitable working space will be provided by the Engineer-in-charge/HITES to the Contractor as per site conditions and availability. The Contractor may have to carry out some cutting/ filling work for making this area workable. The cost of all such Works shall be deemed to have been included in the contract price quoted for the Works and no payment shall be made on this account.

Before commencement of the work, the Contractor shall obtain approval of the Engineer-in-charge the location of cement godown, steel stacking and fabrication yard, site office and shall from time to time take instructions from the Engineer – in-charge regarding collection and stacking of materials at

the site.

No excavated earth or building material shall be stacked on areas where other buildings, roads, services or compound wall or any other structure are to be constructed.

### 37.2 Contractor's Temporary Structures

The Contractor may, at his own expense and subject to the approval of the Engineer-in-charge/HITES and statutory authorities, as required, construct temporary structures for its site office, stores; Workshop in the working area allocated to him as above and remove the same on completion of Works. The Contractor shall furnish such details of his Temporary Works as may be called for by the Engineer-in-charge/HITES and the Contractor shall satisfy the Engineer-in-charge as to their structural safety. Temporary structures, found unsafe or inefficient shall be removed and replaced in a satisfactory manner.

### 37.3 Contractor's Labour Camp

The Contractor shall make arrangements at his own expense for labour camp/ accommodation for labour and staff to be employed for execution of the work and their conveyance to Site. Labour camp shall not be allowed to construct within the proposed site. No workers/ staff shall be allowed to stay within the Site except with the specific approval of the Engineer-in-charge/ HITES. Proper ID Cards shall be got approved/authorized by the contractor from the Engineer-in-charge/ HITES to authorise the Contractor's staff and workers to enter the Site.

### 37.4 Water Supply & Power Supply

The Contractor shall make his own arrangement for water supply at Site for drinking as well as construction purposes & Power Supply at his own cost. Non-availability of power supply and /or water from whatever source shall not entail any additional claims or extension of Contract period in this account.

### 37.5 Infrastructure for Project Coordination & Site office

The contractor shall, within 30 days of issue of letter of acceptance, at his own cost, provide a reasonably furnished air conditioned site office of area 60 Sqm (approx.) having, a sample room, A.C meeting room, staff rooms along with toilets & pantry with file storage facility, brand new computer (1 No.) with Auto Cad, Broad band (1 No.) and printer (A3-1 No.) with their consumables, a telephone, licensed version MS Project software. Electricity & drinking water shall also be provided by the contractor free of cost for such period.

### 37.6 Temporary Barricading

The Contractor shall at his own expense, erect and maintain in good condition temporary barricades all around the working area as per directions of the Engineer-in- charge.

### 37.7 The contractor shall make, till completion of the project arrangements for/of:

- i. Proper pumping for removing water from the basement or elsewhere at site.
- ii. Proper security, safety, transportation, manpower, lighting arrangement for execution of works at night.
- iii. Tower crane, batching plant and others machinery, tools and tackles required for timely execution of work.
- iv. Proper barricading around site so that surrounding area is made free from disturbances. The specifications of barricading shall be got approved by Engineer- in-charge. A signage board shall be placed in the External face of barricading also as instructed by Engineer in charge.
- v. Diversion of underground services with the approval of Engineer-in- charge.

## 37.8 Restriction in work areas.

(a). The contractor must see the site of the work, its approaches carefully before tendering, No claim of any sort shall be entertained on account of any site conditions. If any approach from main road is required or existing approach is to be improved and maintained, for cartage and materials by the contractor, the same shall be done by the contractor his own cost.

(b). Some restrictions may be imposed by the HITES's authorities or its security staff etc., on the working and/or movement of labour, materials etc. The contractor shall follow all such restrictions / instructions and nothing shall be payable on this account.

(c). In case the contractor is not permitted to erect the huts for labour at the site of work, the contractor will have to make his own arrangement to provide such accommodation elsewhere and nothing extra shall be paid on this account.

(d). The contractor shall obtain approval of the HITES to erect the hutments for labour etc. at the site of work; denial of approval shall not affect the construction activities.

(e). The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards such as day and night boards, speed limit boards, red lights and providing barriers. He shall be responsible for all damages and accidents caused due to negligence on his part. No hindrance shall be caused to traffic during the execution of the work as the site is located within the premises of a running hospital.

**38. Compliance of Statutory Obligations and obtaining Approvals/ Completion Certificates:**

The Contractor shall obtain all the statutory obligations and obtain all required clearances to implement the project without any financial repercussions to Engineer-in-charge and ensure all follow up actions with the local authorities in this respect for smooth completion of the project. The Contractor shall obtain all necessary approvals from Municipal bodies and other local bodies including, Water supply agencies, Electric Supply and inspectorate agencies, Police and Security Agencies, Chief Controller of Explosives, Fire Department, Civil Aviation Department, in accordance to prevailing rules, Building Bye-Laws etc., as the case may be with related to Construction/ Completion. The responsibility of the Contractor shall include obtaining approval from local electrical inspector, water & Sewer line connection, permission for bore well and for temporary structures etc. from local Authorities.

The contractor shall assist the Engineer-in-charge to obtain all NOC, completion & Occupancy certificates from respective local bodies and other statutory authorities (as applicable) as under:

- i) Pollution control Board,
- ii) NOC from fire department,
- iii) Chief Electrical Inspector CEA,
- iv) State Electricity board
- v) Local Municipal authority.
- vi) Airport Authority,
- vii) Forest Department for Tree cutting etc.,
- viii) Explosive department,
- ix) Local Municipal authority for water and sewer connection,
- x) Any other statutory requirement for execution of work and to occupy the buildings and run the services in all respects.

Contractor shall organize all inspections of concerned authorities & obtain the NOC's within the time for completion. The Engineer-in-charge may, at the written request of the Contractor, assist him in obtaining the approvals from relevant authorities. However any such request by the Contractor shall



not bind the Engineer-in-charge / HITES in any manner.

All expenditure on these accounts will be borne by the contractor. However the fees paid by the contractor to these statutory authorities only for obtaining the required statutory approvals shall be reimbursed by the HITES/Client on submission of valid payment receipts from these statutory authorities.

The contractor is required to submit the relevant drawings like completion Drawings and any other statutory documentary requirements of local bodies in copies as per requirement to obtain the above etc. at their own cost.

### **39. Rates: -**

3.1. The quoted rates shall be for complete items of work i.e. inclusive of material, labour, plant and machinery, tools and tackles, batching plant etc. including water & electricity, overhead charges, all taxes, duties, statutory charges/ levies applicable from time to time and others as specified (excluding GST) etc, incidental works and all other charges for items contingent to the work, such as, packing, forwarding, insurance, freight and delivery at Site, watch and ward of all materials & successful installation, testing & commissioning at site etc.

3.2. The rate of all items of work, shall, unless clearly specified otherwise include cost of all labour, materials and all other inputs required in the execution of the item, excluding GST and any other levies.

3.3. Unless otherwise specified in the schedule of quantities, the rate tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depth of the building and nothing extra shall be payable to him on any account.

3.4. The rates for items of work wherein cement is used are inclusive of cost for curing.

3.5. Royalty at the prevalent rates whenever payable shall have to be borne by the contractor on the boulders, metal, shingle, sand and bajri etc., or any other materials collected by him for the work direct to the revenue authority of the District / State Government concerned and nothing extra shall be payable on this account

### **41. GEOTECHNICAL**

#### 1. Scope of work

1.1 Confirmatory boreholes at foundation depth shall be taken to confirm the actual safe bearing capacity (SBC) for sump and service building.

1.2 The bidders shall consider the same in their quote while preparing the financial bid.

### **42. EXECUTION OF WORK IN EXISTING WORKING HOSPITAL**

**1. Minimizing disruption to hospital operations and patient care:** The work should be scheduled during off-hours, creating designated work zones, and ensuring proper communication with hospital staff.

**2. Maintaining a safe environment:** Appropriate safety measures should be implemented, such as controlling dust and noise levels, and ensuring that fire and evacuation procedures are not compromised.

**3. Coordination with hospital staff and departments:** This includes establishing clear lines of communication, addressing any concerns raised by hospital staff, and ensuring that hospital operations are not disrupted by the construction work.

**43. PAYMENT TERMS**

The terms of payments, in general, shall be governed by the provisions contained in General Conditions of Contract and relevant CPWD Specifications. However, the specific provisions are described as under:-

A. For DG Sets, Transformer, HT LT Panels, UPS, Solar PV Station:- The following percentages of contract rates shall be payable against the stages of work shown herein:

Stage	Stage of Work	Machinery & Equipment
I	After initial inspection (wherever specified) and delivery at site in good condition on pro-rata basis	70%
II	After completion of installation	10%
III	On Testing & Commissioning	10%
IV	Taking over by the HITES/Client	10%

B. For Fire Alarm, Public Address, EPABX System,,CCTV, AV System- The following percentages of contract rates shall be payable against the stages of work shown herein:

Stage	Stage of Work	Equipment
I	After initial inspection (wherever specified) and delivery at site in good condition on pro-rata basis	70%
II	After completion of installation	10%
III	On Testing & Commissioning	10%
IV	Taking over by the HITES/Client	10%

C. Firefighting System, HVAC System, Lift:- The following percentage of Contract rates shall be payable against the stages of work shown herein:-

Stage	Stage of Work	Percentage
I	After initial inspection (wherever specified) and delivery at site in good condition as verified by the Engineer In Charge on pro-rata basis	70%
II	After completion of installation pro-rata on	20%

	pro-rata basis	
III	On Testing, commissioning and completion of successful running in period and taking over by the HITES/Client	10%

**Note: Security deposit @5% shall be deducted from all the bills as per Vol 1 & 2 of tender document which shall be released only after completion of Defect Liability period.**

**CHAPTER B****SPECIAL CONDITIONS – PLUMBING, WATER SUPPLY AND SANITATION****Plumbing, Water supply and Sanitation**

The plumbing, water supply and waste water collection in the project Thrissur Dental College is envisaged under this item.

**Scope of work**

The scope of works consists of Supply, Installation, Testing and Commissioning of the following

- Collection of water from various sources like Bore well, Open well, Pond etc. and storing the same in raw water storage tank. Collection of water from KWA main and storing it in domestic water tank.
- Providing Pump and pumping main for pumping water from UG Sump to Central Overhead tank (OHT).
- Distribution of water from OHT to various user points through pipes, valves and fittings by gravity.
- Providing Non pressure pipes in roads for pipe crossings; to allow water supply and drainage pipes to pass through.
- Provide Thrust blocks and anchor blocks as per site conditions.
- Coordinate with Sewage treatment Plant contractor.
- Cross checking levels shown in the drawings with site levels and providing sewer lines from Building to Sewage treatment plant via manholes and drop manholes as per drawings and conforming to site conditions.
- To coordinate with other services like Fire, Electrical and HVAC including checking of feeder capacity, location of main panel etc.
- The contractor shall prepare shop drawings before start of work. The contractor shall set out the works and shall be responsible for the for the true and perfect setting out of the same like correctness of position, levels, dimension, alignment , location of sleeves, core cutting, core packing etc. The contractor shall confirm the quantities based on the shop drawings before purchase of material.
- Coordination drawings, including all MEP services and civil works, if necessary shall be prepared by the contractor.
- To prepare material submittal of items used for execution and submit hard copy of the same to the consultant for approval before procurement of materials.
- The contractor shall visit the site and do proper study before submitting the tender. He shall clear any technical doubts regarding the above work before submitting the bid. The tender queries shall be send as document to the consultant.

- Testing of plumbing pipes before concealing and recording the same in log book by contractor and countersigned by site engineer.
- Prepare commissioning report with details like test reports of drinking water, documents of rectification done after pressure testing, new items added or deleted for proper functioning of the system, etc.
- Submission of documents like pump efficiency charts, warranty documents of various equipment etc.
- Prepare As Built drawings with all details like sizes, levels and submit signed color prints in A1 sheet – 4 sets. The soft copy of the same shall also be furnished.
- The contractor shall prepare necessary drawings and documents and do liaison works for obtaining water and drainage connection from Public Authority/Department. Any fee payable to the Government shall be borne by the owner.
- The defect liability period shall start from the date of handing over of the system. The defect liability period of all works under this head shall be as per GCC.

## CHAPTER C

### SPECIFIC CONDITIONS – ELECTRICAL & ELV SYSTEM

#### **General**

The Electrical & ELV installations shall be in total conformity with the Single Line Diagrams, Design Basis Report, Schematic Drawings, Floor wise layouts of various services, Technical specifications, Statutory guidelines relevant to various services as mentioned in DBR & technical specifications, Approved List of Manufacturers. All works and materials submitted by the Contractor and approved by the Engineer-in-charge & shall be tested & commissioned in the presence of the Contractor and the Engineer - in- Charge.

The responsibility for the sufficiency, adequacy and conformity to the Contract requirements of the electrical installation work lies solely with the Contractor.

The planning, design, construction and workmanship shall be in accordance with the best engineering practices to ensure satisfactory performance and service life and shall be complete in all respects. Any materials or accessories which may not have been specifically mentioned, but which are necessary for the satisfactory and trouble-free operation and maintenance of the equipment shall be provided without any extra cost. This shall also include spares, consumables, tools & tackles required for commissioning of the equipment.

The Contractor shall obtain statutory approvals for the following from respective authorities:

- a. KSEI's approval - Electrical scheme of the project from KSEB's metering point including Substation / DG set / Solar PV/Earthing / Lightning protection system
- b. PCB's Approval - DG set installation
- c. Fire Rescue Directorate's approval – Fire alarm / Public address cum voice evacuation / Fire fighters telephone system
- d. KSEB - To obtain permanent power supply from their substation including calibration of energy meter and CT and for installation of Solar PV station
- e. Approval from any other statutory body in connection with completion of services work for the project

Note: - All statutory fee payable in this regard will be reimbursed against production of original receipts/documentary evidence.

#### **Completeness of Bid**

All sundry fittings, assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections as required, and all other sundry items which are useful and necessary for proper assembly and efficient working of the various components of the work shall be deemed to have been included in the quoted prices, whether such items are specifically mentioned in the Bid documents or not.

#### **Works to be done by the Contractor**

Unless and otherwise mentioned in the Bid documents, the following works shall be done by the Contractor, and their cost shall be deemed to be included in the respective electrical related items, in case the provision for the same is not included in civil works:-

Foundations for equipment and components where required, including foundation bolts

Cutting and making good all damages caused during installation and restoring the same to their original finish

- a. Sealing of all floor openings including shafts and niches etc. provided for pipes, ducts, cables, bus bars etc from fire safety point of view, after laying of the same.

- b. Painting at site of all exposed metal surfaces of the installation other than pre-painted items like fittings, fans, switchgear/ distribution gear items, cubicle switch board etc. damages during erection, shall however be rectified by the contractor.
- c. Testing and commissioning of complete installation.

Cutting of structural members:

No structural member shall be chased or cut without the written permission of the Engineer-in-Charge.

## **Drawings**

### **Tender drawings**

The tender drawings have been appended to the tender document for guidance of the contractor. The contractor shall plan and design all services and prepare shop drawings. The shop drawings shall cover, but not limited to, the extent and general arrangements of the fixtures, controlling switches, wiring system, distribution boards, panels, sub-panels, rising mains etc.

The Contractor shall submit requisite number of working electrical drawings based on tender drawings including reflected ceiling plan for the Engineer-in-charge's approval. Contractor has to make necessary changes if any as per comments given by Engineer-in-charge before execution. The work shall be executed as indicated in the approved drawings, however any minor changes found essential to co-ordinate the installation of this work with the other trades shall be made in consultation with the Engineer-in-charge.

Any discrepancies noticed shall be reported to the Engineer-in-charge for clarification. In case of failure to do so Contractor shall not be entitled to any cost for omissions or defects in electrical drawings due to any conflict with other services work.

Any information/data shown/not shown in these drawings shall not relieve the contractor of his responsibility to carry out the work as per the specifications. Additional information required by the bidder/tenderer for successfully completing the work shall be obtained by him.

**Position of HT/LT Switch Boards/Transformer & DG Sets**

The recommended position of the Switch boards, Transformer & DG Sets as shown on the layout drawings will be adhered to as far as practicable.

The contractor shall procure such equipment/ materials as per list of the approved makes with prior approval of Engineer-in-Charge. For all non-specified items, approval of the HITES shall be obtained prior to procurement of the same. HITES shall in no way be liable for rejection of the any material due to poor quality, poor workmanship, poor material etc.

### **Shop Drawings**

Prior to the laying of the conduits and trunking, the Contractor shall submit the shop drawings for the approval of the Engineer-in-charge. The observations, if any, of Engineer-in-charge shall be incorporated and drawings shall be re-submitted for the approval of the Engineer-in-charge.

The Contractor shall prepare and submit to the Engineer-in-charge for his approval detail shop drawings for all Electrical & ELV services, General Arrangement Drawings, SLD, Floor wise/building wise Single line diagram, Rising mains schematic diagram showing tap off boxes at each floor and connectivity to floor panel, Solar PV station GA drawing and connectivity to the grid, power/ control wiring drawing for Main & Sub Panels/ Distribution Boards, special pull boxes, light & fan switchboards, Earthing system and Lightning protection system and other equipment to be procured/ fabricated by the Contractor.

Contractor shall submit following documents to Engineer in charge for approval: -

- a. Electrical load sheet showing following: -
- Mentioning total connected load/maximum demand/diversity factor etc of the project
  - Mechanical equipment load (HVAC & Fire) –room wise / floor wise
  - Biomedical load - Equipment wise load X ray/CT
  - Electrical load - plumbing services etc. with individual load

- Street light – internal roads & parking areas
  - Any other equipment/item required for the completion of the project
  - Note: - Documents to be submitted from manufacturer to justify the electrical load of each equipment
  - b. Earthing design calculation sheet – Value of soil resistivity/fault level calculations/selection of earth conductor/earth electrode size
  - c. Lightning protection system – Sizing of down conductor/selection of mesh size
- Note: - contractor shall refer risk analysis study of lightning in this area done by govt. accredited agencies and propose appropriate system for the project.
- d. Harmonics study to be conducted on energization of the project and necessary corrections if required to be done by the contractor
  - e. Contractor shall submit shop drawings mentioned below to Engineer in charge for approval.
    - Lighting/ Power/ Cable tray/ CCTV/Telephone/ Data/ Fire alarm/ Public address/ Fire fighters telephone system– Floor wise for the project
    - Single line diagram for each service
    - Schematic diagram mentioning FP / DP Structure, 11kV/433V transformers, USS, DG sets, UPS, Bus ducts, LT panels, Sub panels, PCC/Equipment panels, Rising mains, VDBs as applicable
    - Schematic diagrams of CCTV/ Telephone/ Data/ Fire alarm/ Public address/ Fire fighters Talkback system/AV system
    - Solar PV station layout/ Electrical connectivity from solar power to Grid power
    - Earthing layout
    - Lightning protection system layout
    - Street light layout
    - External electrical & ELV service layout as applicable
    - Foundation details of equipment as applicable
    - Cable trench in substations & electrical rooms/Slab cut outs for cable tray/Cable/Rising main/ELV system/Shafts as applicable
    - External HT / LT cable trench layout as applicable

The contractor shall prepare detailed coordinated electrical shop drawing indicating lighting/lighting fixtures, convenience outlets, DG Sets, Fuel Piping and Exhaust piping drawing, U.S.S, FP / DP structure, LT Panel Boards/ Panels, PCC, DBs, Rising Mains, Cable Schedule with other relevant services and submit for approval of the Engineer-in-Charge before commencing the work.

The shop drawings shall indicate all setting out details and physical dimensions of all components, GA Drawings, wiring and cable details for 11KV Panel Board, LT Panels, USS, D.G. set, PCCs, MCCs, Cable schedule, External Electrical & ELV services drawing, street lighting layout and routes, manhole trap etc.

The fixing details for conduits indicating run and size of wire/cables, outlet/pull/junction boxes etc. with fixing details etc. shall be provided. All works shall be carried out after the approval of these drawings. However, approval of these drawings do not relieve the contractor of his responsibility for providing maintenance free and fool proof system including any missing component/ accessories to meet with the intent of the specifications. Contractor will submit requisite no of prints for preliminary approval and finally requisite sets of prints for distribution.

The Contractor shall submit and get approved the relevant drawings at least 15 days before placing of the orders with manufacturers/suppliers.

Note:-

The approval of shop drawings, schedule, brochures etc. by Engineer-in-charge and shall not relieve the Contractor from responsibility for any deviation from drawings or specifications unless he has in writing informed by Engineer-in-charge of such deviations at the time of submission of the drawings nor shall it relieve the Contractor from any responsibility for errors or omissions of any kind in the shop drawings.

### **Materials & Equipment and Approval**

All the materials and equipment shall be of the approved make and design. Unless otherwise called for any approval by Engineer-in-Charge, only the best quality materials and equipment shall be used.



All materials and equipment shall be ISI marked, as applicable, and shall be of the make and design approved by the Engineer-in-charge. Unless otherwise called for, only the best Grade of materials and equipment shall be used. The Contractor shall be responsible for the safe custody of all materials and equipment till these are taken over by CLIENT/HITES and shall insure them against theft, damage by fire, earth quake etc. A list of items of materials and equipment, together with a sample of each shall be submitted to the Engineer-in-charge for his approval and shall be kept in the sample box.

All materials used on the Works shall be new and of the approved quality, conforming to the relevant specifications. Prior approval shall be obtained in writing from the Engineer-in-charge for all materials proposed and when approved, sample shall be duly identified and labeled, it shall be deposited with the by Engineer-in-charge/ and shall be kept in the sample room at Site

### **Inspection, Testing and Inspection Certificate**

The HITES or duly authorized representative shall have at all reasonable times free access to the Contractor/ Manufacturer's premises or works and shall have the power at all reasonable times to inspect and examine the materials and workmanship of the works during its manufacture or erection, if part of the works is being manufactured or assembled at other premises or works, the Contractor shall obtain permission to inspect as if the works were manufactured or assembled on the Contractor's own premises or works. Inspection may be made at any stage of manufacture, dispatch or at site at the option of the HITES and the equipment if found unsatisfactory due to bad workmanship or quality, material is liable to be rejected.

All equipment being supplied shall conform to Routine and Type Tests in accordance with relevant IS Codes requirements stipulated under respective sections. Routine and Type Tests shall be carried out at manufacturers' works/ factories. Expenditure incurred on conducting such tests shall be to the Contractor's account. Bidder shall submit the routine & type tests reports to Engineer-In-charge.

The contractor shall inform HITES within fifteen (15) days from the date of inspection or as defined, inform in writing to the Contractor of any objection to any drawings and all or any equipment and workmanship which in his opinion is not in accordance with the Contract. The Contractor shall give due consideration to such objections and make the necessary modifications accordingly.

Before dispatch to site, the contractor shall offer the equipment for inspection at premises of the manufacturer, 15 days in advance and inform HITES about the date of inspection. Subsequently, HITES shall depute its Inspection Engineer(s) for carrying out the inspection at premises of the manufacturer on mutually agreed date(s). Contractor shall invariably depute his representative(s) for witnessing the complete inspection procedure jointly with Inspection Engineer(s) of HITES.

The contractor shall arrange all necessary instruments, tools, tackles and testing facilities free of cost for such inspections. Contractor shall arrange for inspection visit(s) and bear all inspection costs including Inland/ abroad travel (Air/Rail/Road), lodging and boarding expenses etc. free of cost for the Inspection Engineer(s) deputed by HITES.

For tests whether at the premises or at the works of the Contractor or of any Sub- Contractor, the Contractor except where otherwise specified shall provide free of charge such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be required by HITES or this authorized representative to carry out effectively such tests of the equipment in accordance with the Specification.

The inspection by HITES and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Contractor in respect of the agreed quality assurance programme forming a part of the Contract.

The HITES will have the right of having at his own expenses any other tests(s) of reasonable nature carried out at Contractor's premises or at site or in any other place in addition of aforesaid type and routine tests to satisfy that the material comply with the specifications.

The HITES reserves the right for getting any field tests not specified in respective sections of the technical specification conducted on the completely assembled equipment at site. The testing equipment for these tests shall be provided by the Contractor.

HITES reserves the right to waive off inspection of any equipment, items etc at its sole discretion.

Notwithstanding approval of tests or equipment by the by Engineer-in-charge, the Contractor shall be required to perform site tests and prove the correctness of ratings and performance of equipment / machinery and materials supplied and installed by the Contractor as per the Contract specifications and conditions. The Engineer-in-charge shall also have the power to order the material or work to be tested by an independent agency at the Contractor's expense in order to prove soundness & adequacy.

### **Testing and Commissioning**

The Contractor shall pay for and arrange without any cost to the Engineer-in-charge, all necessary balancing and testing equipment, instruments, materials, accessories, power, water, fuel and the requisite labour for testing. Any defects in materials and/ or in workmanship detected in the course of testing shall be rectified by the Contractor entirely at his own cost, to the satisfaction of the Engineer-in-charge. The installation shall be retested after rectification of defects and shall be commissioned only after approval by the Engineer-in-charge. All tests shall be carried out in the presence of the Engineer-in- charge or his representative.

### **Factory Acceptance Test**

Following equipment are to be tested at their factory/works before delivery to the site:

- Transformer
- LT/AMF/Other electrical panels
- Bus duct as applicable
- DG set
- UPS (including battery)

FAT format for each equipment shall be submitted to engineer in charge for approval prior to visit. Material without factory acceptance test certificates shall not be permitted to install at site

### **Packaging**

All the equipment shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at Site till the time of erection. While packing all the materials, the limitation from the point of view of availability of Railway wagon/truck/trailer sizes in India should be taken account of the Contractor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor. HITES takes no responsibility of the availability of any special packaging/transporting arrangement.

### **Tests**

#### **Charging**

On completion of erection of the equipment and before charging, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the HITES and the Contractor for correctness and completeness of installation and acceptability for charging, leading to initial pre-commissioning tests at Site. The pre-commissioning tests to be performed as per relevant I.S. given and shall be included in the Contractor's quality assurance programme.

#### **Commissioning Tests**

The available instrumentation and control equipment will be used during such tests and the Contractor will calibrate all such measuring equipment and devices as far as practicable. However, unmeasurable parameters shall be taken into account in a reasonable manner by the contractor for the requirement of these tests. The tests will be conducted at the specified load points and as near the specified cycle condition as practicable. The Contractor will apply proper corrections in calculation, to take into account conditions, which do not correspond to the specified conditions.

All instruments, tools and tackles required for the successful completion of the Commissioning Tests shall be provided by the Contractor, free of cost.

Pre-commissioning test shall be carried out as per relevant IS and/or as specified.

The Contractor shall be responsible for obtaining statutory clearances from the concerned authorities for commissioning of the equipment. However necessary fee shall be reimbursed by HITES on production of requisite documents.

#### **Performance Guarantee Certificates for Equipment**

All equipment shall be guaranteed against unsatisfactory performance and/or break down for a minimum period of 36 months or date of Completion of work as certified by the EIC, whichever is later. The equipment or component or any other part of installation so found defective within the guarantee period shall be replaced / repaired by the Contractor free of cost to the satisfaction of the CLIENT / HITES. The above guarantee and/ or warrantee provided by the manufacturer will be submitted along with all the test certificates from manufacturer to HITES.

#### **Completion Drawings (As Built Drawings)**

On completion of the work and before issue of certificate of virtual completion, the Contractor shall at his own cost submit to the Engineer-in-charge requisite sets of layout drawings drawn at the approved scale indicating the actual installations. These drawings shall clearly indicate the complete plant layouts, and piping layouts, location wiring, exact location of all the concealed piping, valves, controls, wiring and other services. The Contractor shall also submit requisite sets of consolidated control diagrams, technical literature on all automatic controls and complete technical literature on all equipment and materials. The Contractor shall mount a set of all consolidated control diagrams and all piping diagrams/ Single Line diagrams in a frame with glass, and display in the substation.

#### **As built drawings**

Also, the contractor shall submit soft copy of “As Built” drawings (in AutoCAD & PDF format) of the work including write up (trouble shooting, installation, operation and maintenance manual with instructions) incorporating all such changes and modifications during engineering and execution along with warrantee & guarantee certificates from manufacturers. As-Built Drawings for all buildings/ blocks/ facilities constructed shall be provided as following:

- Single Line diagrams showing FP / DP structure, 11kV/433V USS/transformer, DG sets, UPS, all LT Panels, DB, Rising mains etc.
- Routing and locations of conduits, inspection boxes and junction boxes etc.
- Locations and rating of Light, Power and UPS sockets and switches
- Location and details of main & sub distribution boards, distribution boards indicating the circuit number controlled by them
- Type of fitting viz. LED, pendants, brackets, bulkhead etc., including their rating & type of lamp, fans and exhaust fans
- A complete wiring diagram as installed and schematic drawing showing all connections for the complete electrical system
- Location of telephone/data outlets, junction boxes and sizes of various conduits and number & sizes of wire drawn
- Layout of Telephone/ LAN/OFC cables
- Location of all earthing stations, route and size of all earthing conductors, manholes etc.
- Layout and particulars of cables & sub mains.
- Schematic drawing for Telephone, Data & EPABX System
- Layout of conduits & locations of for LAN/ Wifi Points
- Layout and details of Earthing Network & Lightning protection system including Insulation tests and earth test results
- Fire Alarm Control System, PA System drawings and Fire fighters telephone system drawings
- General Arrangement drawings for all Electrical & LV Equipment
- Cable route layout of HT, LT, Control cables & other cables
- External lighting drawing with road layout
- Fuel Pipeline route Layout
- Any other drawings/ details as per requirements and directions of Engineer-in-charge.

**Repairs**

All equipment that requires repairing shall be immediately serviced and repaired during the defect liability period. All spares/parts and labours shall be furnished by the contractor free of cost.

**Training of Personnel**

The Contractor shall arrange for training of the HITES/ CLIENT's personnel prior to provisional takeover of the project including for the following:

- Substation Equipment (Transformers, DG sets, Panel boards)
- UPS
- Telephone Exchange
- CCTV / Fire alarm / Public Address / FF telephone system/ AV system
- Adjustment of setting for controls and protective devices
- Preventive maintenance
- Operation of all electrical panels including the interconnectivity and interlocking scheme
- Any other specialized system as executed under this contract

**Safe Custody and Storage**

Safe custody of all machinery and equipment dismantled, shifted & supplied by the Contractor shall be his own responsibility till the final taking over by the CLIENT/ HITES. The Contractor should, therefore, employ sufficient staff for watch and ward at his own expenses.

CLIENT/ HITES may, however, allow the Contractor to use the building space for temporary storage of such equipment, if such space is available.

**Handling, Storing and Installation**

In accordance with the specific installation instructions as shown on manufacturer's drawings or as directed by the HITES or his representative, the contractor shall unload, store, erect, install, wire, test and place into commercial use all the equipment included in the contract. Equipment shall be installed in a neat, workman like manner so that it is level, plumb, square and properly aligned and oriented.

Contractor shall follow the unloading and transporting procedure at site, as well as storing, testing and commissioning of the various equipment being procured by him separately. Contractor shall unload, transport, store, erect, test and commission the equipment as per instructions of the manufacturer's Engineer(s) and shall extend full co-operation to them.

In case of any doubt/ misunderstanding as to the correct interpretation of manufacturer's drawings or instructions, necessary clarifications shall be obtained from the HITES. Contractor shall be held responsible for any damage to the equipment consequent for not following manufacturer's drawings/instructions correctly.

Where assemblies are supplied in more than one section, Contractor shall make all necessary connections between sections. All components shall be protected against damage during unloading, transportation, storage, installation, testing and commissioning. Any equipment damaged due to negligence or carelessness or otherwise shall be replaced by the Contractor at his own expense.

The Contractor shall submit to the HITES every week, a report detailing all the receipts during the week. However, the Contractor shall be solely responsible for any shortages or damages in transit, handling and/or in storage and erection of the equipment at Site. Any demurrage, wharf age and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor. The Contractor shall be fully responsible for the equipment/material until the same is handed over to the HITES in an operating condition after commissioning. Contractor shall be responsible for the maintenance of the equipment/material while in storage as well as after erection until taken over by HITES, as well as protection of the same against theft, element of nature, corrosion, damages etc.

The Contractor shall be responsible for making suitable indoor storage facilities, to store all equipment, which require indoor storage.

Exposed live parts shall be placed high enough above ground to meet the requirements of electrical and other statutory safety codes.

The minimum phase to earth, phase to phase and section clearance along with other technical parameters for the various voltage levels shall be maintained as per relevant IS codes.

### **Eligibility**

#### **Electrical works**

The proposed contractor shall hold valid class A Electrical Contractor's License (i.e., All LT / MV / HT Electrical Installation upto a connected load of mentioned in the main SLD having 11kV/415 volts transformers and DG sets) from Kerala State Electrical Inspectorate (KSEI) to execute the electrical works mentioned for this project.

The main contractor can appoint a sub-contractor holding above mentioned license.

#### **ELV works**

Contractor shall appoint subcontractor for following works with eligibility as mentioned below:  
Works:-

- CCTV system
- Fire alarm system
- Public address system
- FF telephone system
- Telephone system & EPABX
- Data system
- AV system

Subcontractor shall be authorised by Original Equipment Manufacturer (OEM) for above systems. The OEM shall be selected from Approved List of Manufacturers (ALM).

The sub-contractor to be engaged must have office/ Service Facility in this region (Kerala, Tamilnadu, Telangana and Karnataka) since last 5 years.

The sub-contractor to be engaged for specialized systems shall submit details of similar executed works (value and volume of works) in Kerala, Tamilnadu, Telangana & Karnataka for a minimum period of last 5 years.

CONTRACTOR shall submit work completion certificates from clients (of the sub-contractor to be engaged for specialized works) regarding satisfactory functioning of these systems during the last 5 year.

If required CONTRACTOR shall arrange site visit to the engineer in charge at his cost in projects executed by the proposed OEM.

#### **KSECBC 2017 compliance.**

All materials and works under the scope of electrical services shall adhere to KSECBC 2017 guidelines.

No additional cost or escalation shall be paid for electrical items on whatever accounts it may be.

Necessary materials / provisions shall be considered while quoting the rate for each item under electrical works for complying with KSECBC 2017.

## **CHAPTER D**

### **SPECIFIC CONDITIONS – HVAC SYSTEM**

#### **1. General**

The Specific Conditions of the Contract - HVAC System shall be read in conjunction with the Specific Conditions of the Contract-Scope of Work, and, Specific Condition of the Contract-General. In case of variations / deviations, if any, the Specific Conditions of the Contract- HVAC System shall prevail.

#### **2. Scope of Contract**

The scope of works to be carried out under this section comprises of Supply, Installation, Testing and Commissioning of Heating, Ventilation and Air-conditioning works as illustrated in Technical Specifications, BoQ etc.

#### **3. Stores and Materials**

The contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings and specifications etc. taken together whether the same may or may not be particularly shown or described therein provided that the same can be reasonably inferred there from.

#### **4. Supply of Equipment**

Equipment shall be strictly as per the list of approved makes/ manufacturers given in the Bid documents subject to approval of the Engineer-in-charge. The Contractor shall submit manufacturer's test certificates of equipment supplied.

#### **5. Shop / Working Drawings etc.**

5.1. The Contractor shall prepare and submit to the Engineer-in-charge for approval, three sets of detailed shop drawings/layouts of various rooms/floors, GA drawing of various equipment like Out Door Units /AHUs /FCUs /Panels along with foundation & other relevant details etc., equipment characteristics, capacity details of all equipment, accessories and devices etc. as per specifications shall be submitted well in advance or as required for approval of Engineer-in-charge. The structure works should not be affected due to delay on this account. No claims for extension of time shall be entertained because of any delay in the work due to failure on part of the contractor to produce shop drawings in time.

5.2. If the Engineer-in-charge makes any amendment in the above drawings, the Contractor shall supply requisite sets of fresh drawings with the amendments duly incorporated, along with the drawings on which corrections were made. After final approval has been obtained from the Engineer - in- Charge, the Contractor shall submit further requisite sets of shop drawings for the exclusive use of and retention by the Engineer-in-charge.

5.3. Approval of shop drawings shall not be considered as a guarantee of measurement or of building condition. It will in no way relieve the contractor from his responsibility of furnishing materials or performing work as required by the contract.

#### **6. Completion Drawings (As Built Drawings):-**

Following "AS BUILT" drawings shall be submitted by the Contractor on completion of the work:

a. Installation drawings giving complete details of the entire equipment including Outdoor Units, AHU, FCUs and their foundations.

b. Ducting drawings showing all sizes, damper (Fire/VCD) locations and sizes of all air outlets and intakes, for all floors.

- c. Electrical drawings showing cable sizes, equipment capacities, control components and control wiring.
- d. Schematic control drawings giving detailed sequence of operation and notes to explain the operation of the control circuit.
- e. Piping drawings showing all pipe sizes, valves and fittings etc.
- f. Any other drawings to be supplied as per instructions of the Engineer-in-charge.

## **7. Operation and Service Manuals**

7.1. The Contractor shall submit requisite sets of operation and service manuals in respect of the air-conditioning plant including salient details of plant including internal circuit diagrams. Following minimum details shall be furnished:

- i. Detailed equipment data as approved by the Engineer-in-charge.
- ii. Manufacturer's maintenance and operating instruction.
- iii. Approved test readings.

7.2. The Contractor shall also submit requisite sets of technical literature on all automatic controls and complete technical literature on all equipment and materials.

## **8. Inspection at Work / Contractor's Premises**

8.1. The CLIENT/ HITES or their representatives shall at all reasonable time have free access to the Contractor's premises/works. The Contractor shall give every facility to them and necessary help for inspection and examinations and test of the materials and workmanship.

8.2. These representatives shall have full powers to inspect drawings of any portion of the work or examine the materials and workmanship of the plant at the Contractor's works or at any other place from where the material or equipment is to be obtained. Acceptance of any material or equipment shall in no way, relieve the Contractor of his responsibility for meeting the requirement of the specifications.

## **9. Sub-contracting**

The Contractor may sub-contract part of the works with the written approval of the Engineer-in-charge. Sub-contractors as approved by the Engineer - in- Charge shall be appointed for carrying out the entire work of supplying, installation, testing and commissioning of all the equipment covered under this package. However, the overall responsibility for compliance of the Contract lies with the Contractor. The agency/ sub- contractor so chosen shall be got approved from the Engineer-in-charge.

## **10. Technical Submittals**

The Contractor shall submit Technical Submittals for all materials, equipment and machinery for approval in writing of the Engineer-in-charge before placing orders. The material submittals shall comprise of at least the following:

- i. Manufacturer's technical catalogues and brochures, Certifications etc. giving technical data about performance and other parameters.
- ii. Compliance of Tender specification along with sign & stamp of both contractor and manufacturer.
- iii. Manufacturers drawings / sketches showing construction, dimensional and installation details.
- iv. Rating charts and performance curves clarifying rating of equipment proposed.

## **11. Samples and Prototypes**

The Contractor shall submit samples of items such as grilles/ diffusers, insulation, controls and/ or any other parts or equipment as required by the Engineer-in-charge for prior approval in writing before placing the order. The Contractor shall also construct prototype or samples of work as laid down in the Contract or as instructed by the Engineer-in-charge.

## **12. Testing and Commissioning**

12.1. Tests on equipment as called for in the specifications shall be carried out by the Contractor in accordance with the specifications, the relevant Bureau of Indian Standard Codes (BIS) and International Standards.

12.2. The initial tests shall include but not be limited to the following:

- i. To operate and check the proper functioning of all electrically operated components viz., compressor motor, blowers, air handling units, rotating machine, fans, etc.
- ii. To operate and check the proper functioning of all electrical panels, switch gears, safety and other controls
- iii. To adjust and balance air and gas quantities to provide the designed flow rates by adjusting valves, dampers, diverters etc.
- iv. To check the systems against leaks in different circuits, alignment of motor, etc.
- v. To check the vibration and noise levels of the equipment
- vi. Setting of all control and all such other tests which are essential for smooth functioning of the plant.

12.3. The Contractor shall pay for and arrange without any cost, all necessary balancing and testing equipment, instruments, materials, accessories, power, water, fuel and the requisite labour for testing. Any defects in materials and/or in workmanship detected in the course of testing shall be rectified by the Contractor entirely at his own cost, to the satisfaction of the Engineer-in-charge. The installation shall be tested again after removal of defects if any and shall be commissioned only after approval by the Engineer-in-charge. All tests shall be carried out in the presence of the Engineer-in-charge or his representative.

12.4. After completion of the HVAC system, the same shall be put to a continuous running test for a period of 48 hours. All adjustments should be made prior to this test so that proper conditions / working are achieved during this testing. The Contractor shall pay for and arrange at his own cost for materials, accessories, power, water, fuel and the requisite labour for this testing the test readings shall be noted in the Testing format approved by the Engineer-in-charge.

## **13. Final Performance and Capacity Test**

In addition to the above testing, final performance and capacity tests shall be carried out on the equipment as per the "Testing Schedules" during the defects liability period

All the arrangements required for making the entire system operational /running, for the performance test as above, including cost of manpower, and fuel (Gas etc.), electricity etc. will be borne by the Contractor.

13.1. The user shall have the right to get the operation of all equipment, if these are in the operating condition if such equipment, have been accepted as complete and satisfactory. Repairs and alterations if required shall be carried out by the Contractor as and when directed by the CLIENT/ HITES. In special circumstances, CLIENT/ HITES may request Air conditioning of some areas even before the completion of whole of HVAC work. The Contractor shall arrange accordingly as per requirements.

## **14. Guarantee and Defects Liability Period**



All equipment shall be guaranteed against unsatisfactory performance and/or break down for a minimum period of 36 months or date of handing over of work to the CLIENT/ HITES, whichever is later. The equipment or component or any other part of installation so found defective within the guarantee period shall be replaced / repaired by the Contractor free of cost to the satisfaction of the CLIENT / HITES. The above guarantee and/ or warranty provided by the manufacturer will be submitted along with all the test certificates from manufacturer to HITES.

**15. Performance Guarantee from Sub-contractor**

The Contractor shall submit a performance guarantee certificate from the agency which executed the HVAC work, counter signed by the Contractor that the system shall maintain the desired parameters within tolerance limit of the specified parameters who shall also guarantee that the capacity of various components as well as the whole system covered under the scope of work, technical schedules and requirements etc., shall not be less than the specified capacities. The guarantee of the specific equipment supplied alone with regard to the performance of the system shall not be acceptable and overall responsibility of the Contractor for performance of HVAC work & its compliance with the Contract terms and conditions remains unchanged.

**16. Maintenance**

The Contractor shall carry out routine and special maintenance of the plant and attend to any defects that may arise in operation of the plant during the Defects Liability Period.

**17. Validation:** - Third party Validation of Classified Areas (such as OTs/ICUs/Labs & other Critical Areas etc.) as instructed by the Engineer in Charge shall be in the scope of contractor & nothing extra will be paid in this regard. This work has to be executed if being instructed by EIC or Client Representative.

It shall include as follows:-

- Documentation for DQ/IQ/OQ with certificates of all brought items
- Duct leakage testing during duct installation as & when required.
- Air flow velocity test
- Air borne particulate test
- Temperature & RH monitoring test
- Area recovery test
- Room pressure balancing & any other test as required.

**18. Painting**

All equipment and ancillary items such as pipes, supports etc., will be painted in an approved manner, using standard paints as approved by HITES/ Engineer-in-charge

**19. Safe Custody and Storage**

The contractor shall be responsible for safe custody of all machinery and equipment supplied and installed till the final taking over by the CLIENT/ HITES.

**20. Training of Personnel**

The Contractor shall arrange to train the HITES/CLIENT's personnel on the following aspects prior to provisional takeover of the plant:

- a) Operation of plant
- b) Gas charging and pumping down of the system

- c) Adjustments of settings for controls and protective devices
- d) Preventive maintenance
- e) Disassembling and assembling of compressor including identification and replacement.

## **CHAPTER E**

### **SPECIAL CONDITIONS – FIRE PROTECTION SYSTEM (FPS)**

#### **1. General**

The Specific Conditions of the Contract - FPS System shall be read in conjunction with the Specific Conditions of the Contract-Scope of Work, and, Specific Condition of the Contract-General. In case of variations / deviations, if any, the Specific Conditions of the Contract- FPS System shall prevail.

#### **2. Scope of Contract**

The scope of works to be carried out under this section comprises of Design, Supply, Installation, Testing and Commissioning of Fire protection works as illustrated in Design Basis Report, Technical Specifications etc.

#### **3. Stores and Materials**

The contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings and specifications etc. taken together whether the same may or may not be particularly shown or described therein provided that the same can be reasonably inferred there from.

#### **4. Supply of Equipment/ Materials**

Equipment/ materials shall be strictly as per the list of approved makes/ manufacturers given in the Bid documents subject to approval of the Engineer-in-charge. The Contractor shall submit manufacturer's test certificates of equipment supplied.

#### **5. Shop / Working Drawings etc.**

5.1. To achieve the desired parameters/requirements as specified in Design Basis Report/Technical Specifications etc., the Contractor shall prepare detailed design of the Fire Protection works along with capacity calculations & submit to Engineer-in-charge for approval.

5.2. Subsequent to approval of the scheme as above, the Contractor shall prepare and submit to the Engineer-in-charge for approval, three sets of detailed shop drawings/layouts of various rooms/floors, Pump Room, External Layout. GA drawing of various equipment like Pumps, Valves, Panelsetc along with foundation & other relevant details etc., equipment characteristics, pump curves and capacity details of all equipment, accessories and devices etc. as per specifications shall be submitted well in advance or as required for approval of Engineer-in-charge. The structure works should not be affected due to delay on this account. No claims for extension of time shall be entertained because of any delay in the work due to failure on part of the contractor to produce shop drawings in time.

5.3. If the Engineer-in-charge makes any amendment in the above drawings, the Contractor shall supply requisite sets of fresh drawings with the amendments duly incorporated, along with the drawings on which corrections were made. After final approval has been obtained from the Engineer - in- Charge, the Contractor shall submit a further requisite sets of shop drawings for the exclusive use of and retention by the Engineer-in-charge.

5.4. Approval of shop drawings shall not be considered as a guarantee of measurement or of building condition. It will in no way relieve the contractor from his responsibility of furnishing materials or performing work as required by the contract.

#### **6. Completion Drawings (As Built Drawings):-**

Following "AS BUILT" drawings shall be submitted by the Contractor on completion of the work:

- g. Pump Room installation drawings giving complete details of the entire equipment including Pumps, Motors, foundation details, Valves etc
- h. Piping drawings showing all sizes, Valve & fittings locations and sizes, sprinkler positioning, Extinguisher positioning, for all floors.
- i. Electrical drawings showing cable sizes, equipment capacities, control components and control wiring.
- j. Schematic drawings.
- k. Fire escape layout
- l. Any other drawings to be supplied as per instructions of the Engineer-in-charge.

## **7. Operation and Service Manuals**

7.1. The Contractor shall submit requisite sets of operation and service manuals including salient details of plant including internal circuit diagrams. Following minimum details shall be furnished:

- iv. Detailed equipment data as approved by the Engineer-in-charge.
- v. Manufacturer's maintenance and operating instruction.
- vi. Approved test readings.

7.2. The Contractor shall also submit requisite sets of technical literature on all automatic controls and complete technical literature on all equipment and materials. The Contractor shall frame under glass, in the pump room all consolidated control diagrams and all piping diagrams.

7.3. Coloured Layouts of all electrical lines in A-1 size properly laminated to be fixed at various locations at the time of handing over of building.

## **8. Inspection at Work / Contractor's Premises**

8.1. The CLIENT/ HITES or their representatives shall at all reasonable time have free access to the Contractor's premises/works. The Contractor shall give every facility to them and necessary help for inspection and examinations and test of the materials and workmanship.

8.2. These representatives shall have full powers to inspect drawings of any portion of the work or examine the materials and workmanship of the plant at the Contractor's works or at any other place from where the material or equipment is to be obtained. Acceptance of any material or equipment shall in no way, relieve the Contractor of his responsibility for meeting the requirement of the specifications.

## **9. Sub-contracting**

The Contractor may sub-contract part of the works with the written approval of the Engineer-in-charge. Sub-contractors as approved by the Engineer - in- Charge shall be appointed for carrying out the entire work of supplying, installation, testing and commissioning of all the equipment covered under this package. However, the overall responsibility for compliance of the Contract lies with the Contractor. The agency/ sub- contractor so chosen shall be got approved from the Engineer-in-charge.

## **10. Technical Submittals**

The Contractor shall submit Technical Submittals for all materials, equipment and machinery for approval in writing of the Engineer-in-charge before placing orders. The material submittals shall comprise of at least the following:

- v. Manufacturer's technical catalogues and brochures pump curves, Certifications

etc. giving technical data about performance and other parameters.

vi. Compliance of Tender specification and DBR along with sign & stamp of both contractor and manufacturer.

vii. Manufacturer's drawings / sketches showing construction, dimensional and installation details.

viii. Rating charts and performance curves clarifying rating of equipment proposed.

### **11. Samples and Prototypes**

The Contractor shall submit samples of items such as valves, sprinklers etc or any other parts or equipment as required by the Engineer-in-charge for prior approval in writing before placing the order. The Contractor shall also construct prototype or samples of work as laid down in the Contract or as instructed by the Engineer-in-charge.

### **12. Testing and Commissioning**

12.1. Tests on equipment as called for in the specifications shall be carried out by the Contractor in accordance with the specifications, the relevant Bureau of Indian Standard Codes (BIS) and International Standards.

12.2. The initial tests shall include but not be limited to the following:

vii. To operate and check the proper functioning of all electrically operated components viz., compressor motor, pumps, blowers, air handling units, rotating machine, fans, boilers, etc.

viii. To operate and check the proper functioning of all electrical panels, switch gears, safety and other controls

ix. Pressure test

x. To check the vibration and noise levels of the equipment.

xi. Setting of all control and all such other tests which are essential for smooth functioning of the plant.

12.3. The Contractor shall pay for and arrange without any cost, all necessary balancing and testing equipment, instruments, materials, accessories, power, water, fuel and the requisite labour for testing. Any defects in materials and/or in workmanship detected in the course of testing shall be rectified by the Contractor entirely at his own cost, to the satisfaction of the Engineer-in-charge. The installation shall be tested again after removal of defects if any and shall be commissioned only after approval by the Engineer-in-charge. All tests shall be carried out in the presence of the Engineer-in-charge or his representative.

### **13. Guarantee and Defects Liability Period**

All equipment shall be guaranteed against unsatisfactory performance and/or break down for a minimum period of 36 months from date of completion of work as certified by HITES, whichever is later. The equipment or component or any other part of installation so found defective within the guarantee period shall be replaced / repaired by the Contractor free of cost to the satisfaction of the CLIENT / HITES. The above guarantee and/ or warranty provided by the manufacturer will be submitted along with all the test certificates from manufacturer to HITES.

### **14. Performance Guarantee from Sub-contractor**

The Contractor shall submit a performance guarantee certificate from the agency which executed the FPS work, counter signed by the Contractor that the system shall maintain the desired

parameters within tolerance limit of the specified parameters who shall also guarantee that the capacity of various components as well as the whole system covered under the scope of work, technical schedules and requirements etc., shall not be less than the specified capacities. The guarantee of the specific equipment supplied alone with regard to the performance of the system shall not be acceptable and overall responsibility of the Contractor for performance of FPS work & its compliance with the Contract terms and conditions remains unchanged.

**15. Maintenance**

The Contractor shall attend to any defects that may arise in operation of the plant during the Defects Liability Period.

**16. Painting**

All equipment and ancillary items such as pipes, supports etc., will be painted in an approved manner, using standard paints as approved by HITES/ Engineer-in-charge

**17. Safe Custody and Storage**

The contractor shall be responsible for safe custody of all machinery and equipment supplied and installed till the final taking over by the CLIENT/ HITES.

**18. Training of Personnel**

The Contractor shall arrange to train the HITES/CLIENT's personnel on the following aspects prior to provisional takeover of the plant:

- f) Operation of plant
- g) Adjustments of settings for controls and protective devices
- h) Preventive maintenance

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