

MINISTRY OF HEALTH & FAMILY WELFARE

GOVERNMENT OF INDIA, NEW DELHI

Tender No. MoHFW/ME/NIAHS-DELHI/HLL/ID/2013

**Request for Proposal (RFP)
*for***

**Construction of National Institute of Allied Health Sciences (NIAHS)
at NAJAFGARH, DELHI**

VOLUME – II

Special Conditions of Contract

(SCC)



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SPECIAL CONDITIONS OF CONTRACT (S C C)

1. Scope of Contract

The scope of work comprises of construction of multi-storeyed buildings of New Operation Theater Block, Services Blocks, and MGS Building. It also includes water supply, sanitary & plumbing comprehensive Fire Fighting/Protection System, Internal & External Electrification, HVAC Works, Lifts, CCTV and Security System, Boiler for Hot Water Supply, Solar Panel, PA System ,EPABX/ Communication System, LAN system, water treatment system, Site development works such as Internal road + Path & site levelling, sewer and storm water drainage works etc.

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. It also includes maintenance of these works during defect liability period and subsequently for a period of five years.

2. Drawings

(a) 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 equipments 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 Client.

(b) Issue and custody of drawings & specifications

The contractor on the signing of contract shall be furnished free of cost three copies 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 Client/Engineer-in-charge/Consultant 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 starting of the works and necessarily updated or revised time to time) 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 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.

(c) Bar Bending Schedule

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

(d) Working drawings/ Shop drawings/ Design:

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

Structural and architectural drawings will be provided by the Engineer-in-charge / Consultant. However, to ensure the uninterrupted progress of work and timely completion, the contractor will do further detailing as per site requirement at his own.

Detailing for shop drawings of all services will have to be done by the contractor based on the schematics and other details provided by the Engineer-in-charge /Consultant or local authorities. The work will be executed by the contractor based on the approved 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 equipments, 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 specialised 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 carryout 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.

3. Disruption of Progress

- (a). The Contractor shall give 4 weeks 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 drawing 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.
- (b). If by reason of any failure or inability of the Engineer-in-charge /Consultant to issue drawings/ order/ clarifications within 4 weeks of such notice 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 out of the above.

4. Further Drawings and Instructions

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/Consultant. The Engineer-in-charge /Consultant 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 /Consultant ’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 specification.
- 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 / Consultant, 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 / Consultant, these shall be deemed to be Engineer - in- Charge / Consultant’s instructions within the scope of the contract

5. 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 /Consultant 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 / Consultant .

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 Consultant / 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 / Consultant. Wherever different pattern/ Design/ Quality of materials with same specification/ make as specified in the contract, is available in the market, Consultant/ 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 / Consultant. 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). 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.

(c). Temporary works and arrangements:

The Contractor shall furnish to the Engineer-in-charge /Consultant 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.

(d). 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 tress 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 borne by the Contractor.

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

(e). 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 /Consultant for specific materials in specific locations and in approved manner. The Engineer-in-charge / Consultant 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.

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 /Consultant. Storage of materials / equipment else where shall not be considered as "Delivered at Site."

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 fulfilment of his obligations under this sub-clause shall be deemed to have been included in the financial bid and subsequent contract.

6. Watching & 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 /Consultant, 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.

7. 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 as defined in sub-clauses of Clause 12, 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 clause 33 hereof. In case of failure on the part of the contractor the damage/ loss/ injury shall be made good by the client at the risk and cost of the contractor.

8. 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.

9. **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 Senior 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 Representative shall have the power to take joint measurement and sign the measurement books / bills. Any direction, explanations, instructions or notices given by the Consultant/ 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 powers.

The contractor should submit curriculum vitae (CV) of the following key personnel proposed to be deployed at site for supervision and execution of work.

- Director/Project Coordinator
- Project Managers
- Construction Engineers
- Project Engineers
- Billing Engineers
- Quality Control Engineers
- Planning Engineers

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 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 qualification and experience as per requirement of the contract) to Engineer-in-Charge/ Consultant for their approval.

A list of all technical and key personal staffs must be submitted to the Engineer-in-Charge / Consultant with their area of work / responsibility with verified signature and the link persons to receive the instruction at site (in case the main person was not found at site) during the inspection by representative of Client and/or Consultant and/or 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 /Consultant.

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

(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/Client/Consultant to the site and other working places.

10. 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 Client / Engineer-in-charge/ Consultant 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 byelaws 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/Consultant 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/ Consultant

The contractor shall bring to the attention of the Engineer-in-charge/Consultant 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 client/consultant on production of authorised receipts.

11. 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/Consultant 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/ Consultant and / or Client 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 Consultant shall 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.

12. 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 Condition 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 / Consultant's instructions and shall be subjected from time to time to such tests as the Engineer-in-charge / Consultant 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/ out side India may be inspected by the Engineer-in-charge/Consultant/ any representative as nominated by the client. 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 /Consultant '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 /Consultant 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/ Consultant may carry out Third Party Quality Assurance /Audit by an independent agency/ individual/firm/institute at any time. 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.

(b). Samples

- i) All samples of materials and /or items of works in adequate numbers, sizes, shades & pattern as per specifications shall be supplied by the contractor without any extra charge. Contractor shall submit Samples to the Engineer-in-charge/Consultant 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 instead to the satisfaction of the Engineer-in-charge /Consultant. 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 /Consultant 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/Consultant.
- ii) Submittal Procedures
 - (a). 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.
 - (b). 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.

- (c). At the time of each submission, contractor shall give the Engineer-in-charge/ Consultant 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
- iii) Review and Approval: 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.
- iv) 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/Consultant 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/ Consultant on previous submittals.
- v) Above referred review and approval 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/Consultant's 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 / Consultant relieve Contractor from responsibility for complying with the requirements of contract.
- vi) Only when the samples are approved in writing by the Consultant, the contractor shall proceed with the procurement and installation of the particular material / equipment. The approved samples shall be signed by the Consultant 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.
- vii) 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.
- viii) The Consultant 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 best qualities from various manufacturers and such other aspects causing delay on the approval of the materials / equipment's etc. shall be to the account of the contractor. In this respect the decision of the Engineer-in-charge shall be the final.
- ix) 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 /Consultant and compared with the approved sample and his specific obtained before using the same in the work.

(a). 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/Consultant 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 which it was intended to fulfil.

(b). 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/Consultant including staff required for testing. The test shall be carried out jointly in the presence of Engineer-in-charge/ Consultant or his representative and the contractor or his representative.

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 /Consultant. All such records shall be maintained jointly by the contractor and Engineer-in-charge/ Consultant these shall remain under the custody of the Engineer-in-charge / Consultant.

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/Consultant. 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.

13. Absence of Specifications

If the nomenclature of any item do 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 /Consultant who will clarify the issue within a reasonable time.

14. 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 fulfilment of the contract.

15. Access for Inspection

Persons nominated by Engineer-in-charge /Consultant 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 / Consultant and their representatives every facility necessary for checking measurements, inspection and examination and test of the materials and workmanship.

16. 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/Consultant and the contractor shall give due notice to the Engineer-in-charge/Consultant whenever any such work or foundation is or ready or about to be ready for examination and the Engineer-in-charge/Consultant 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 /Consultant may direct from time to time and shall reinstate and make good such part or parts to the satisfaction of the Engineer-in-charge /Consultant at his own cost.

17. Assignment

The contractor shall not, without the prior consent of the Engineer-in-charge / Consultant 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/Consultant, 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 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/Consultant shall be final.

18. 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 /Consultant which he has executed during the preceding month, to which the contractor may consider himself entitled supported with analysis of rates being claimed.

19. (a) Inspection & Testing during manufacture

The Client / Engineer-in-charge / Consultant 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 Client / Engineer-in-charge / Consultant 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 shall be mutually agreed by the Engineer-in-charge / Consultant 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) Certificate of Testing

As and when fabrication materials shall pass the tests referred in this clause, the Engineer-in-charge /Consultant shall furnish to the contractor a certificate in writing to that effect.

(e) Rejection

If as a result of such inspection, examination or test of the works (other than a Test on Completion the Engineer-in-charge /Consultant 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 ensures that the material complies with the Contract. Thereafter, if required by the Engineer-in-charge/Consultant, the tests shall be repeated under the same terms and conditions till satisfactory results are made available.

(f) 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/Consultant directs, no material shall be brought to the site which is not required for execution of the work.

(g) 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/Consultant. Rectified components shall be subject to re-testing till desired results are obtained.

(h) Inspection Reports

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

20. Virtual Completion Certificate

When the whole of the Work is substantially 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 alongwith an under taking to rectify any defects that may be found during inspection. The Engineer - in- Charge / consultant shall jointly inspect the work with the contractor within 30 days of receipt of such notice.
- (b). The Engineer-in-charge / Consultant shall inspect the works are 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/Consultant will cause undue difficulties in satisfactory use/ occupation of the works.

21. Provisional Acceptance and Certificate of final completion**(a) Provisional Acceptance**

The work shall be deemed to have been provisionally accepted after fulfilment of all the following by the Contractor.

- i) Submitting As-Built Drawings, Catalogues, Brochures, and Data Sheets, manuals in the form as directed by Engineer in Charge ii). Obtaining Certificate of Completion from the Engineer-in- Charge /Consultant.
- ii) 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/Consultant.

(b) 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/Consultant stating that the Works have been completed to his satisfaction and remedying / rectifying of defects have been satisfactorily completed.

The Engineer-in-charge/Consultant shall give the Certificate for Final Completion as per the following whichever is later:

- Twenty-eight days after the expiration of the Defects Liability Period

OR

- If different Defect Liability Periods shall become applicable to different sections or parts of the Works, the expiration of the last such period

OR

- As soon thereafter as any works ordered during such period have been completed to the satisfaction of the Client.

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. 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 Client / Engineer-in- charge/ Consultant are due to materials or workmanship not in accordance with the contract, shall be rectified as per the directions in writing of the Client / Engineer-in- charge/ Consultant 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 Client / Engineer-in-charge /Consultant/ 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 Client / Engineer-in-charge/Consultant/ may recover the amount from the dues of the contractor with any other government/department.

(b). Execution of work of repair etc.

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/Consultant from materials or workmanship not having in accordance with the contract, shall upon the direction in writing of the Engineer-in-charge's / Consultant'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 Contractor at his own expense if the necessity thereof shall, in the opinion of the Engineer-in-charge/Consultant, 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 Client/ Engineer-in-charge/ Consultant.

23. Works by Other Agencies

The Client/ Engineer-in-charge/Consultant 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 /Consultant 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 Client/ Engineer-in-charge /Consultant 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.

24. Dues not paid by the Contractor

The contractor shall pay all dues or fees to Statutory authorities and Electric and Water supply authorities & Lift licensing authority etc. within due period and indemnify the Client and the Engineer-in-charge /Consultant 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 Client 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 Client or any other means available to the Client such as bank guarantee.

25. 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/ Consultant/Client 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/ Consultant/ 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/Consultant 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/Consultant, or may shall be deducted by the Engineer-in- charge/ Consultant from any monies due or which may become due to Contractor.

26. Boreholes & Exploratory Excavation

If, at any time during the execution of the Works, the Engineer-in-charge /Consultant 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.

27. 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.

28. 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 /Consultant, 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.

29. Operations and Maintenance Manual

The Contractor shall provide and submit to the Engineer-in-charge /Consultant with two 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.
- SECTION D: Planned maintenance instruction 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 /Consultant , 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 /Consultant . The cost of providing such records including proper submission thereof is deemed to be included in the Contract Sum quoted by the Contractor.

30. Reports by Contractor

- (a.) 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 /Consultant and his signature obtained.
 - (b.) The Contractor shall file daily category-wise labour report to the Engineer-in-charge / Consultant. The report shall indicate scheduled requirement against actual strength.
 - (c.) 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 /Consultant & shall be reviewed in Weekly Co-ordination Meetings.
 - (d.) The Contractor shall submit Monthly Progress Report in triplicate in format approved by Engineer-in-charge /Consultant. Failure to submit reports may result in holding up or delay in Payment of bills.
 - (e.) **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 / Consultant during the constructions stages and after completion and 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 /Consultant.
 - (f.) The Contractor shall submit CPM – Pert Chart and activity wise bar charts for the complete work within 30 days of award of work for approval by the Engineer - in- Charge /Consultant. On the basis of approved bar charts contractor shall submit Progress Charts by the 10th day of every month.
- 31.** 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.

32. Technical Examination

The Client/ Engineer-In-Charge/ Consultant shall have the right to cause Audit and Technical Examination of the works and the final bills of the contractor including all supporting vouchers,

abstracts, etc. to be made as per payments of the 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 Client/ Engineer-in-charge/Consultant 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. The work comes under the purview of CVC and as such all orders and instructions are applicable to this work.

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 Client 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 Client 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 completion.

33. 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 licence 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, warning signs and watch post, when and where necessary or directed by the Engineer-in-charge / Consultant or by any duly constituted authority for the protect for the 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 / Consultant 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 / Consultant 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 authorised representative of the contractor. For this purpose the contractor should authorise one of his employees on the site instruction book itself. Site instruction book shall have machine numbered pages and shall be carefully maintained and remain under custody of Engineer-in-charge / Consultant/Client the contractor can also avail of the site instructions book for urgent communication with Engineer-in-charge/ Consultant. Any instruction which Engineer-in-charge / Consultant may like to issue to the Contractor may be recorded by the Engineer-in-charge / Consultant in site instruction book.

(h.) Signage

The Contractor shall provide at his own cost, a sign board at directed location having overall size 2 meters by 4 meters indicating name of the project, and a three-D view of the project, as approved by Engineer-In-Charge/Consultant. The signboard will be illuminated during night.

- (i.) **Cutting of Trees** Permission for cutting of trees if required will be obtained by Client from the concerned authority
- (j.) The contractor shall have adequate generators of required capacity as per site requirement as stand by 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
- (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 Bar Chart/ Network. 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 /Consultant.

34. Co-ordination Meetings

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

35. Site Management:

The contractor shall make, till completion of the project:

- a) Proper pumping arrangement for removing water from the basement or elsewhere at site.
- b) Proper arrangement of security, safety, transportation, manpower, lighting arrangement for execution of works at night.
- c) Arrangement of tower crane, batching plant and others machinery, tools and tackles required for timely execution of work.
- d) 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 / Consultant. External face of barricading to display name of Client, Consultant & Engineer-in-charge. No sign board of contractor is allowed unless permitted by the Engineer-in-charge in writing.
- e) Arrangement for diversion of underground services with the approval of Engineer-in-charge.

36. Statutory Requirements/ Approvals

The Contractor shall be responsible for obtaining approval from local electrical inspector, Lifts authority & water & Sewer line connection, tree cuttings, permission for bore well and for temporary structures etc. from local Authorities. All the statutory expenditure incurred towards payment to the local bodies for getting local Electric inspector, sewer line and water supply connection for Client/ Engineer-in-charge /Consultant will be reimbursed on the production of proof of payment. Contractor will be extended all assistance in this connection by the Engineer-in-charge /Consultant/ client.

The Contractor shall obtain all necessary approvals from Municipal and other local bodies including Municipal bodies, Water supply agencies concerned, Electric Supply and inspectorate. Agencies concerned, Police and Security Agencies, Chief Controller of Explosives, Fire Department, Civil Aviation Department, concerned in accordance to prevailing rules, Building Bye-Laws etc., as the case may be with related to Construction/ Completion. All expenditure on this account 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 Client on submission of valid payment receipts from these statutory authorities.

The approvals shall include the **following in addition to any other approval which may be required for the project.**

- Construction Permit if required
- NOC from Chief Fire Officer
- NOC from Lift Inspector where lifts are provided
- Occupancy certificate

The Engineer-in-charge/Consultant /Client 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/Consultant /Client in any manner.

- (a) Contractor's Working Area

Suitable working space will be provided by the Engineer-in-charge/Consultant /Client 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.

(b) Contractor's Temporary Structures

The Contractor may, at his own expense and subject to the approval of the Engineer-in-charge / Consultant /Client and statutory authorities, construct temporary structures for its site office, stores; Workshop etc. 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/Consultant /Client and the Contractor shall satisfy the Engineer-in-charge/Consultant as to their structural safety. Temporary structures, found unsafe or inefficient shall be removed and replaced in a satisfactory manner.

(c) 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. No workers/ staff shall be allowed to stay within the Site except with the specific approval of the Engineer-in-charge/Consultant /Client. Proper ID Cards shall be got approved /authorized by the contractor from the Engineer-in-charge/ Consultant / Client to authorise the Contractor's staff and workers to enter the Site.

(d) Procurement of Various Materials

The Engineer-in-charge/Consultant / Client 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. 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 /Consultant. Samples for all the materials to be used in the work shall be got approved from Engineer-in-charge/Consultant before their bulk procurement. Samples approved shall be kept in the sample room till the completion of the work. However in case of delay in procurement of various materials by the contractor resulting into likely delay in completion of work, the Engineer-in-charge /Consultant /Client may procure the required materials directly and the cost of the same will be recovered from the contractor.

(e) 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.

(f) Site office

The contractor at his own cost shall provide a reasonably furnished site office of area 150 Sqm (approx.)having, a sample room, A.C meeting room, staff rooms along with toilets & pantry with file storage facility, computers (4 Nos.),Broad band (2 Nos.) and printers (2 Nos.) with their consumables, a telephone for the Engineer-in-charge and his site staff. Electricity & drinking water will be provided by the contractor free of cost.

(g) Temporary Fencing

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

37. Compliance of Statutory Obligations for obtaining completion Certificates:

The Contractor shall comply all the statutory obligations and obtain all required clearances to implement the project without any financial repercussions to Engineer-in-charge /Consultant /client and ensure all follow up actions with the local authorities in this respect for smooth completion of the project. All statutory charges to get any NOC, clearances from local authorities shall be reimbursed by the Engineer-in-charge /Consultant / client after submission of the bills/documentary evidences by the contractor. The contractor shall assist the client/Engineer-in-charge /Consultant to obtain all NOC, completion & Occupancy certificates from respective local bodies and other statutory authorities as under:

- i) Pollution control Board,
- ii) Environment clearances,
- iii) NOC from fire department,
- iv) Lift licence,
- v) Chief Electrical Inspector CEA,
- vi) Local Municipal authority/South Delhi Municipal Corporation etc.
- vii) Airport Authority,
- viii) Forest Department for Tree cutting etc.,
- ix) Explosive department,
- x) Delhi Jal Board / Local Municipal authority for water and sewer connection,
- xi) And any other statutory requirement for execution of work and to occupy the buildings and run the services in all respects.

Contractor shall organise all inspections of concerned authorities & obtain the NOC's within the time for completion.

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.

ADDITIONAL CONDITIONS OF CONTRACT AND SPECIFICATIONS

(A) RELATING TO CIVIL, ELECTRICAL, PLUMBING & FIRE FIGHTING WORKS, HVAC WORKS, LIFTS AND GRIHA RATING SYSTEM

1.0 General

- 1.1 The following Additional Conditions and specification shall be read in conjunction with General Conditions of Contract and Specific Conditions of Contract. If there are any provisions in these Additional Conditions of Contract & specifications which are at variance with the provisions in the above mentioned documents, the provisions in these Additional Conditions of Contract & specifications shall take precedence.
- 1.2 Rates: - 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, overheads charges, all taxes, statutory charges / levies applicable from time to time and others as specified 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.

2.0 Scope of Contract

- 2.1 The scope of work covers the supply, erection, testing and commissioning of the Civil, Plumbing, Fire Fighting & Electrical Systems, HVAC -Air- conditioning, Lifts & Landscaping works which also includes design & preparation of structural and all other detailed shop drawings, testing and commissioning of components and accessories.
 - Civil works, plumbing & Fire Fighting works, Fire Alarm System.
 - Electrical works, HVAC works & Lifts.
 - GRIHA Rating System.
- 2.2 The work shall be carried out in conformity with the relevant drawings and the requirement of architectural, electrical, structural, and other specialised service drawings approved by Engineer-in-charge/Consultant.
- 2.3 The Contractor shall make provision of hangers, sleeves, structural openings and other requirements during construction to avoid holding up progress of the construction schedule. The Contractor should ensure that the structure is designed for additional loads or cut outs. Subsequent Cutting holes in the RCC structural members /slab shall not be allowed.
- 2.4 The contract items comprises of furnishing of all materials, equipment, labour & transportation etc. necessary to render the installation/ item fully operational as per the intent of specification and drawings, including any necessary adjustment or corrections. Further the installation /item shall be in conformity with local laws and manufacturer instructions applicable.

3 Contract Drawings

- 3.1 The drawings issued with the Bid are diagrammatic only and indicate the extent and general arrangement of the installation. Drawings shall not be scaled.
- 3.2 The Contractor shall follow the Bid drawings for preparation of his detailed sanitary, plumbing & fire fighting & Shop drawings and for subsequent installation work and also cross check the drawings of other services to avoid subsequent complications in

inter services. Any discrepancies observed should be immediately brought into the notice of Engineer-in-charge/Consultant and clarifications obtained. No changes from approved plans shall be made without prior approval of the Engineer-in-charge.

4 Shop Drawings

- 4.1 The Contractor shall furnish for approval of the Engineer-in-charge/Consultant three sets of detailed sanitary, plumbing, fire fighting (external & internal), Pump room & Shop drawings of all equipment 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 to be made in accordance with latest fire safety norms and building codes.
- 4.2 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.
- 4.3 For any amendments proposed by Engineer-in-charge /Consultant 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.
- 4.4 No material or equipment may be brought at Site until the Contractor has the approved Shop drawings for that particular material or equipment.
- 4.5 After approval of the drawings by the Engineer-in-charge/Consultant, the Contractor shall further furnish six sets of Shop drawings for the exclusive use of and retention by the Engineer-in-charge/Consultant /Client.
- 4.6 Approval of drawings by the Engineer-in-charge/Consultant 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'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/Consultant or not.
- 4.7 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, 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.
- 4.8 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.

5 Samples and Catalogues

5.1 Prior to ordering any equipment/ material/ system, the Contractor shall submit to the Engineer-in-charge/Consultant the catalogues, along with samples from approved list of manufacturers. No material shall be procured without written approval of the Engineer-in-charge / Consultant.

5.2 Approval of Materials

All materials used on the Works shall be new and of the best quality and make available, conforming to the relevant specifications of the contract. Prior approval shall be obtained in writing from the Engineer-in-charge/Consultant for all materials proposed and when necessary, approved samples duly identified and labelled shall be deposited with the Engineer-in-charge/Consultant 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 /Consultant.

6 Material and Equipment

6.1 All material and equipment shall conform to the relevant Indian Standards and bear IS marking where ever applicable.

6.2 Where interfacing is involved, both equipments shall be mutually compatible in all respects.

6.3 Where an item of equipment, other than as specified or detailed on the drawings, is approved by Engineer-in-charge/ Consultant, 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 by the Engineer.

6.4 All similar equipment, materials, removable parts of similar equipment etc. shall be inter-changeable with one another.

6.5 Approved makes for materials and vendor list

The contractor shall procure materials as scarified in the vendor lists enclosed, the particular material shall be got approved from the Engineer - in- Charge before procurement.

7 Conformity with Statutory Acts, Rules and Standards

7.1 The installation shall be in conformity with the Bye-laws Regulations and Standards of the local authorities applicable to the installations. But if the specifications and drawings call for a higher standard of materials and/or workmanship than those required by any of the above regulations and those required by any of the above regulations and standards, then the specifications and drawings shall take precedence over the said Regulations and Standards.

7.2 However, if the drawings or specifications required something, which violates the Byelaws and Regulations, then the Bye-laws and Regulations shall govern the requirement of such installation/drawings.

7.3 Indian Standards: The System / Components shall conform to relevant Indian standards wherever they exist and to the National Building Code Amended up to date.

- 7.4 Nothing in these Specifications shall be construed to relieve the contractor of his responsibility for the design, Manufacture and installation of equipment with all its accessories in accordance with applicable statutory regulations and safety codes in force.

8 Manufacturer's Instructions

Where manufacturers have furnished specific instructions relating to the materials and equipment used, covering points not specifically mentioned in these documents, manufacture's instructions shall be followed with the approval of Engineer-in-charge.

9 Training and Operating Instructions

- 9.1 If required by the Engineer-in-charge / Consultant, the Contractor shall at his cost, train members of the maintenance staff either at his or the subcontractor's workshop or at such other place or places as may be considered suitable by the Engineer-in-charge / Consultant.
- 9.2 Upon completion of all work and all tests, the Contractor shall furnish the necessary skilled labour and helpers for operating the entire installation for a period of fifteen (15) working days. During this period, the Contractor shall instruct and train the Engineer-in-charge /Consultant/ client representative in operation, adjustments and maintenance of the equipment installed.
- 9.3 The Contractor shall submit to the Engineer-in-charge /Consultant draft comprehensive operating instructions and maintenance schedule for all systems and equipment included in this Contract. This shall be supplemented, not substituted, by manufacturer's operating and maintenance manuals. Upon approval of the draft, the Contractor shall submit to the Engineer-in-charge/Consultant four (4) complete bound sets of operating and maintenance schedules along with manufacturers printed literature.

10 Inspection and Testing

- 10.1 The Engineer-in-charge / Consultant reserve the right to request inspection and testing at manufacturer's Works at all reasonable times during manufacture of items for this Contract.
- 10.2 The Engineer-in-charge / Consultant or his authorised representative shall have full power to inspect the materials and workmanship at the Contractor's Works or at any place from which the materials or equipment is obtained. Approval by the Engineer-in-charge /Consultant of any material or equipment shall in no way relieve the Contractor of his responsibility for meeting the requirements of the specifications. All incident expenditure like travelling, boarding and lodging etc shall be born by the contractor.
- 10.3 Routine and typical tests for the various items of equipment shall be performed at the Contractor's Workshop in the presence of Engineer-in-charge/Consultant or his authorised representative, results recorded and test certificates issued.
- 10.4 After installation has been virtually completed, the Contractor shall carry out under the direction and in the presence of the representative of the Engineer-in-charge such tests and inspections as have been specified, or as considered necessary to determine whether or not the requirements of the item, drawings and specifications have been fulfilled. In case the work does not meet the full intent of the drawings and specifications and further tests after making require changes and as considered necessary shall be done again, the Contractor shall carry them out and bear the expenses thereof. If test fail to demonstrate the satisfactory nature of the installation or

any part thereof, then no claims for the extra cost of modifications, replacement or retesting will be considered. The decision of the Engineer shall be regarded as final as to what constitutes a satisfactory test.

10.5 The above general requirements as to testing shall be read in conjunction with any particular requirements specified elsewhere

10.6 The Contractor shall provide all necessary instruments such as Theodolite, Dumpy level, steel tapes, weighing machine, plumb bobs, spirit levels, hammers, micro-meters, thermometers, hydraulic cube testing machine, smoke test machine and labour for conducting tests. All such equipments shall be tested for calibration by an approved laboratory. The Contractor shall make adequate records of the test procedures, readings and results to be maintained by the Engineer-in-charge/Consultant who shall issue test certificates signed by the person authorised by him.

11 Test Certificates

The contractor shall submit test certificates for all the materials / systems issued by government recognized inspection / office / manufacturer certifying the Equipment / Materials / installation and its function are in agreement with the requirements of relevant specification and accepted standards.

12 Performance Guarantee

It is clearly understood that the specifications, drawings, schedule of quantities for fire fighting system are for bidder's guidance only. The bidder shall carry out necessary calculation and provide alternative equipment required to achieve the specified level of fire fighting required for human safety. Complete sets of Architectural Drawings shall be available at site in the Engineer-in-charge / Consultant office and reference may be made to these drawings as required for calculations or for other details. The contractor shall also guarantee that performance of various equipments, individually, shall not be less than, the specified ratings.

13 Quiet Operation and Vibration

All equipments shall operate under all conditions of designed load without any sound or vibration, which is considered objectionable by the Engineer-in-charge. Such conditions shall be corrected by the Contractor at his own expense. Decision of the Engineer-in-charge / Consultant shall be final in this regard.

14 Accessibility

The Contractor shall locate all equipment, which require servicing, operation or regular maintenance in a fully accessible positions. The exact location and size of access panels, required for each valve or other devices requiring attendance, shall be finalised and communicated to Engineer - in- Charge well in time, to facilitate working by other agencies, failing this, the Contractor shall make all the necessary repairs and changes at his own expense.

15 Handing over & Taking over process

For handing over & taking over process in addition to clauses specified elsewhere, following services / works shall to be complied by the main contractor:

- a. Submission of Guarantees in stamp paper, of appropriate value, (format approved by Engineer-in-charge/Consultant) for all water proofing treatment executed in the works for a period of ten years. If any defects noticed within 10 years from completion of defect liability period the main contractor shall be sole responsible for the defects and

same shall be rectified by the main contractor as per information from client within a period of 10 days from the notice.

- b. Rectification of all defects shall be carried out by the main contractor before Handing over/Taking over process.
- c. As built drawings : - **4 (four)** sets for Architectural, Structural, Plumbing, Electrical, HVAC system, Specialised services and other required drawings as approved by Engineer-in-charge / Consultant shall be submitted by the main contractor before handing over & taking over process.
- d. All services/equipments to be run and check before handing over & taking over process as per requirements of Engineer-in-charge/Consultant.
- e. Contractor has to arrange water, electricity, fuel , consumables and manpower at their own cost for the purpose of testing of services and equipments. No amount shall be payable on this account.
- f. Main contractor shall submit catalogues, brochures, operation manual, manufacturer test certificate, Guaranty/Warranty papers, licence etc for all equipments/materials before handing over & taking over process.

(B) RELATING TO CIVIL WORKS

- (i) All concrete work will be strictly done by automatic computerized batching plant of suitable capacity installed at site or RMC as per approval of Engineer-in-Charge / HLL. No concrete work will be permitted without automatic batching plant unless specifically approved in writing by Engineer-in-Charge / HLL. Transportation of the mix concrete shall be through transit mixers and concrete pumped through suitable concrete pumps and pipes arrangement and vibrated by vibration machines, materials lifts shall also be provided at site as and where required.
- (ii) **Mix Design of Concrete:-** The contractor shall carry out the mix design for the relevant item of concrete from a reputed institution / laboratories as approved by Engineer-in-charge / Consultant at his own expenses within 15 days from notification of award. Samples of materials (i.e. Cement, Coarse & fine aggregates) shall be jointly sealed jointly by Engineer-in-charge /Consultant and contractor before sending the same for Mix design. The design mix may be with or without admixtures as per specifications /requirements at site.
- (iii) Reinforcement Steel conforming to BIS specifications (latest edition) shall be procured directly from main manufacturers or their authorised dealers as per the approved list provided in the agreement. The manufacturer has to give a certificate that the material supplied is not a re-rolled product. Relevant vouchers & test certificates will be produced by the contractor. Re-rolled sections will not be allowed. Reinforcement steel, structural steel shall be stored and stacked in such manner so as to facilitate easy identification, removal etc. The contractor shall take proper care to prevent direct contact between the steel and the ground/ water for which he shall provide necessary arrangement at his own cost including ensuring proper drainage of area to prevent water logging as per directions of the Engineer-in- charge/Consultant. Steel shall also be protected, by applying a coat of neat cement slurry over the bars for which no extra payment shall be made. Test certificates for each consignment of steel shall be furnished and further tests shall be got carried out from the authorized laboratory as per the

directions of Engineer-in-charge /Consultant, before incorporating the materials in the work.

- (iv) Marine plywood only or steel plates of minimum thickness as approved by Engineer-in-charge / Consultant shall be used for formwork. All shuttering material to be used at site will be new / just like new as approved by Engineer-in-charge/Consultant The shuttering plates shall be cleaned and oiled after every repetition and shall be used only after obtaining approval of Engineer's representative at site. The number of repetitions allowed for plywood and steel shuttering shall be at the discretion of Engineer-in- charge / Consultant depending upon the condition of shuttering surface after each use and the decision of Engineer-in-charge/ Consultant in this regard shall be final and binding on the contractor. No claim whatsoever on this account shall be admissible.
- (v) Anti-termite treatment & waterproofing treatment:-
 - a. The treatment against water-proofing of basement, roofs, water retaining areas and termite infestation shall be of type and specifications as given in the schedule of quantities and remain fully effective for a period of not less than 10 (Ten) years to be reckoned from the date of expiring of the Defect Liability period, prescribed in the contract. At any time during the said guarantee period if the Client Engineer-in-charge / Consultant or his representative finds any defects in the said treatment or any evidence of re-infestation, dampness, leakage in any part of buildings or structure and notifies the contractor of the same, the contractor shall be liable to rectify the defect or give re-treatment and shall commence the work or such rectification or re-treatment within seven days from the date of issue of such letter to him. If the contractor fails to commence such work within the stipulated period, the Client Engineer-in-charge /Consultant or his representative may get the same done by another agency at the Contractor's cost and risk and the decision of the Client/ Engineer-in-charge / Consultant for the cost payable by the contractor shall be final and binding upon him. Re-treatment if required shall be attended to and carried out by the Contractor within seven days of the notice from the client or his representative.
 - b. Water proofing and anti-termite treatment shall be got done through approved specialized agencies only with prior approval of the Engineer-in-charge / Consultant or his representative. During the execution of work, if any damage shall occur to the treatment already done, either due to rain or any other circumstances, the same shall be rectified and made good to the entire satisfaction of the client or his representative by the contractor at his costs and risks.
 - c. The contractor shall submit a guarantee bond for the water proofing and anti-termite work executed under the contract in a format specified in the GCC. Further a security deposit amounting to 10% of the cost of these items as executed shall be retained for a period of 10 years with effect from actual date of actual completion of the work. 50% of the security deposit shall be released on successful completion of 5 years period and the balance shall be released on completion of 10 years.
- (vi) Records of Consumption of Cement & Steel –
 - a. For the purpose of keeping a record of cement and steel received at site and consumed in works, the contractor shall maintain a properly bound register in

the form approved by the Engineer-in-charge / Consultant, showing columns like quantity received and used in work and balance in hand etc. The contractor's representative shall sign this register daily.

- b. The register of cement & steel shall be kept at site in the safe custody of Engineer-in-charge / Consultant during progress of the work. This provision will not, however, absolve the contractor from the quality of the final product.

C) RELATING TO ELECTRICAL WORKS & INSTALLATIONS

1.0 General

- i. The electrical installation shall be in total conformity with the control wiring drawings prepared by the Contractor and approved by the Engineer-in-charge & shall be connected and tested in the presence of an authorised representative of the Contractor and of the Engineer - in- Charge.
- ii. The responsibility for the sufficiency, adequacy and conformity to the Contract requirements of the electrical installation work lies solely with the Contractor.

2.0 Regulations and Standards

The installations shall conform in all respects to Indian Standard Code of Practice for Electrical Wiring Installation IS: 732-1989 and as per latest CPWD General Specification for Electrical Works as mentioned in Schedule "F" of General Conditions of Contract. It shall also be in conformity with the current Indian Electricity Rules and regulations in so far as these are applicable to the installations. Wherever these Additional Specific Conditions calls for a higher standard of material and/or workmanship than those required by any of the above regulations, then this Additional Specific Conditions shall take precedence over the said Regulation and Standards. External works & fire detection & alarm system works to be done as per CPWD specification & relevant BIS codes.

3.0 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 Bid rates and prices, whether such items are specifically mentioned in the Bid documents or not.

4.0 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 contract price:

- i. Foundations for equipment and components where required, including foundation bolts
- ii. Cutting and making good all damages caused during installation and restoring the same to their original finish
- iii. Sealing of all floor openings provided for pipes and cables, from fire safety point of view, after laying of the same

- iv. 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.
- v. Testing and commissioning of complete installation

5.0 Completion Certificate by the licensed supervisor

On completion of the installation, a certificate shall be furnished to the Engineer-in-charge, by the Contractor, countersigned by the licensed supervisor under whose direct supervision the installation was carried out. This Certificate shall be in the prescribed form as required by the local authority. On the basis of this certificate, the Contractor shall arrange for inspection of installation by the concerned local authorities.

6.0 Completion Drawings

On completion of the work, the Contractor shall at his own cost submit to the Engineer-in-charge / Consultant 4 (four) sets of layout drawings drawn at the approved scale indicating the installation. 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 4 (four) 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 in a frame with glass, and display in the plant room

7.0 Interrelationship of Services

The Contractor shall keep a check at all stages and supervise at the point of connection the associated civil, HVAC, electrical and plumbing works like underground and overhead tanks, power supply and installation of makeup water connection, drain connection in the fire fighting tanks and vicinity of plant room etc. In case of any discrepancy the same should be brought into the knowledge of Engineer-in-charge / Consultant in writing, all rectifications etc, required in future as a result of failure on the part of the contractor to do so, shall be carried out by the Contractor at his own expenses.

8.0 Check List

The Contractor shall provide to the Engineer-in-charge / Consultant 4 (four) copies of a comprehensive maintenance checklist and shall place a copy of it in the Plant Room. The checklist shall be a list of each piece of equipment in this Contract, and shall provide a space for record of maintenance provided and status of various equipment during the maintenance period. This list shall be updated every month at the time of inspection. The Contractor shall certify on this check list that he has examined each piece of equipment and that; it is operating as intended in the contract.

9.0 Repairs

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

10.0 Control System

During the maintenance period, the Contractor shall monthly check all controls in various areas to ensure that these are functioning satisfactorily. This shall apply to all pressure switches and pressure gauges, contacts, relays, controller switches, high and low pressure cut-outs etc.

11.0 Reference Points

Contractor shall provide permanent bench marks, flag tops and other reference points in consultation with Engineer-in-charge/Consultant for the proper execution of work and these shall be preserved till the completion of the work.

12.0 Licenses and Permits

- i. **Contractor** or the approved specialised agency engaged by them shall hold a valid plumbing, electrical, HVAC, Lifts, license issued by the Competent Authority under whose jurisdiction the work falls.
- ii. The contractor has to take all the approvals of local bodies for all the addition/deletion over the approved building plans which are to be given by the Engineer-in-charge/Consultant. The documents/drawings to be prepared and submitted in the manner desired by them after the same is approved by Engineer-in-charge /**Consultant**. Contractor has to take approvals of entire/Part works if required before start of works. Contractor will be responsible for any work at site carried out without approval of municipal or local bodies.
- iii. Contractor shall keep constant liaison with the competent Municipal or other authority and obtain approvals for all drainage and water supply works carried out by him.
- iv. Contractor shall obtain from the competent Municipal Authority completion certificates with respect to his work as required for occupation of the building.
- v. Any fees in connection with obtaining the approvals on behalf of the Client from the statutory bodies/Corporations/Government departments, etc. shall be paid by the Contractor and the same shall be reimbursed on production of original vouchers. Necessary endorsement / application if required shall be arranged from the Engineer-in-charge/Consultant/Client.
- vi. Before undertaking of works for HVAC, Lifts, Electrical, Anti Termite Treatment, Water proofing, Fire Fighting, Fire alarm system, PA system, EPABX System, Horticulture Works etc., the contractor must take approval of specialised agencies proposed to be engaged by him from Engineer-in-charge/Consultant.

13.0 Cutting of structural members

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

14.0 Operation and Running of entire system

The contractor shall ensure smooth operation & running of entire sanitary, HVAC , Lifts, plumbing and fire fighting system including pumps and RO plant, solar water heating system etc. for a minimum period of one month after satisfactory completion of work as desired by Engineer. Cost of such operation & running of entire system including required material e.g. fuel, consumables, tools & tackles, requisite manpower etc. shall be borne by the contractor & deemed to be included in the contract price , nothing shall be paid on this account.

15.0 Regulations and Standards

The installations shall conform in all respects to Indian Standard Code of Practice for Electrical Wiring Installation IS: 732-1989 and as per latest CPWD General Specification for Electrical Works as mentioned in Schedule "F" of General Conditions of Contract. It shall also be in conformity with the current Indian Electricity Rules and regulations in so far as these are applicable to the installations. Wherever these Additional Specific Conditions calls

for a higher standard of material and/or workmanship than those required by any of the above regulations, then this Additional Specific Conditions shall take precedence over the said Regulation and Standards. External works & fire detection & alarm system works to be done as per CPWD specification & relevant BIS codes.

16.0 Tools for Handling and Erection

All tools and tackles required for handling of equipments and materials at Site of work as well as for their assembly and erection and also necessary test instruments shall be the responsibility of the Contractor.

17.0 Drawings

The drawings indicate the extent and general arrangements of the fixtures, controlling switches, wiring system etc. and are essentially diagrammatic explanation. The drawings indicate the points of termination of conduit runs and broadly suggest the routes to be followed. The Contractor shall submit six sets of working electrical drawings based on tender drawing including reflected ceiling plan coordinating other essential building services for the Engineer-in-charge /Consultant's approval. Contractor has to make necessary changes if any as per comments given by Engineer-in-charge /Consultant 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/Consultant.

The drawings are for guidance of the contractor and exact locations, distance and levels shall be governed by the building. The Contractor shall examine all architectural, structural, plumbing and sanitary & electrical drawings before starting the work any discrepancies noticed shall be reported to the Engineer-in-charge / Consultant 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.

18.0 Conduit/ Trunking Layout

Prior to the laying of the conduits and trunking, the Contractor shall examine/ study drawings and report to Engineer-in-charge/Consultant .If he desires to make any changes from Engineer-in-charge /Consultant proposed conduit layout plan and shall get the same approved from Engineer-in-charge /Consultant .

19.0 Shop Drawings

The Contractor shall prepare and submit to the Engineer-in-charge/Consultant for his approval detail shop drawings for Main & Sub Panels / Distribution Boards, Distribution Boards, special pull boxes, light & fan switch boards, telephone distribution boards, FDA system and lightning protection system and other equipment to be procured/ fabrication by the Contractor before 15 days of placing of the orders with manufacturers/suppliers.

20.0 Manufacturer's Instruction

Manufacturer instructions for approved products shall be followed in consultation with Engineer-in-charge/Consultant.

21.0 Materials & Equipment

All materials and equipment shall be ISI marked and shall be of the make and design approved by the Engineer-in-charge/Consultant . 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 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/Consultant for his approval and shall be kept in the sample box.

22.0 Scale

All drawings shall be prepared to the scale as required for proper explanation and shall indicate the size and location of all equipments and accessories therein. The Contractor shall follow all dimensions of approved architectural drawings for the work or part concerned and check proposed drawings for any interference with the building structure or other equipment or services.

23.0 Brochures and Data

The Contractor shall submit four copies of all brochures / manufacturer's description data, operation manuals with internal complete circuit diagrams and other similar literature while obtaining the approval of product Engineer-in-charge/Consultant.

24.0 Approval of Shop Drawings

The approval of shop drawings, schedule, brochures etc. by Engineer-in-charge / Consultant shall be an approval of general details and arrangements only 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/Consultant 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.

25.0 Samples & Catalogues

Contractor shall submit the samples & catalogue of the material, which are proposed to be used at Site as per the approved makes for obtaining approval of the by Engineer-in-charge/Consultant.

26.0 Approval of Materials

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

27.0 Inspection, Testing and Inspection Certificate

1. The Engineer-in-charge /Consultant and their authorised representative shall have at all reasonable times access to the Contractor's premises or Works and shall be at liberty to inspect and examine the materials and workmanship during its manufacture or erection even when they are being manufactured or assembled at other premises.
2. The Contractor shall arrange all the materials and labour required for inspection of equipment or for any testing to be carried out at his/ manufacturer's works or at Site. Notice for such inspection/ presence for testing shall be given to the Engineer-in-charge / Consultant by the Contractor at least fifteen (15) days in advance together with the routine test certificates of the equipments/ materials given by the manufacturer.
3. Notwithstanding approval of tests or equipment by the by Engineer-in-charge/ Consultant, 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 / Consultant 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.

28.0 Schedule & Manner of Operation

Time being the essence of this Contract, Contractor shall arrange for all required labour & material in sufficient quantities and at appropriate time, execute as per schedule for execution of work to meet the contract period requirement and so manage the operations that the work shall be completed in time as provided in the contract.

29.0 Performance Guarantee Certificates for Equipment

All equipment shall be guaranteed against unsatisfactory performance and/or break down for a minimum period of 12 (Twelve) months from the date of handing over of complete work to the by Client/ Engineer-in-charge/Consultant. 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 / Engineer-in-charge/Consultant. The above guarantee and/ or warrantee provided by the manufacturer will be submitted along with all the test certificates from manufacturer to Engineer-in-charge/Consultant.

30.0 Conformity with Statutory Acts, Rules and Standards

1. All installations shall be in conformity with the Bye-laws, Regulations and Standards of the local authorities applicable them. But if the specifications and drawings call for a higher standard of material and/or workmanship than those required by any of the above Regulations and Standards, then the specifications and drawings provided in the contract shall take precedence over the said regulations and standards.
2. However, if the drawings or specifications required something which violates the Bye-laws and Regulations, then the Bye-laws and Regulations shall govern the requirement of this installation.
3. Indian Electricity Act and Rules: All electrical works in connection with installations of the system shall be carried out in accordance with the provision of the Indian Electricity Act, 1910 and the Indian Electricity Rules 1956, both amended up to date.
4. CPWD Specification: as at Schedule "F" of GCC.
5. Indian Standards: The system / components shall conform to relevant BIS wherever they exist and to the National Building Code-2005 with latest amendments / addendums.
6. Nothing in these specifications shall be construed to relieve the Contractor of his responsibility for the design, manufacture and installation of the equipment with all its accessories in accordance with applicable Statutory Regulations and safety codes in force.

31.0 Completion Drawings (As Built Drawings)

1. On completion of the work and before issue of certificate of virtual completion, the Contractor shall submit to the Client/Engineer-in-charge/Consultant, completion plan drawn to a scale in the manner decided by him including the under mentioned details alongwith one set of computer CD containing the data.

- a. Run and size of conduits, inspection boxes, junction boxes and pulls boxes
- b. Number of circuits in each conduit
- c. Location and rating of sockets and switches controlling the light and power outlets
- d. Location and details of main & sub distribution boards, distribution boards indicating the circuit number controlled by them
- e. Type of fitting viz. fluorescent, pendants, brackets, bulkhead etc., including their rating & type of lamp, fans and exhaust fans
- f. A complete wiring diagram as installed and schematic drawings showing all connections for the complete electrical system
- g. Location of telephone outlets, junction boxes and sizes of various conduits and number & sizes of wire drawn
- h. Layout of telephone cables
- i. Location of all earthing stations, route and size of all earthing conductors, manholes etc.
- j. Layout and particulars of cables & sub mains.
- k. Schematic drawing for telephone system
- l. Layout of conduits for computer outlet points
- m. Layout and details of lightning protection system.
- n. Insulation tests and earth test results
- o. PA System drawings
- p. Disc Antenna drawings
- q. Equipment drawings
- r. Cable route layout of HT, LT & other cables
- t. External lighting drawing with road layout

32.0 Checking of BOQ Quantities

All quantities indicated in BOQ are tentative which may vary as per site conditions. Contractor has to verify quantities before procuring the materials. No payment shall be payable for quantity brought to site but not used.

33.0 Terms of Payment

- A. For items covered by CPWD Specifications (Part-IV -Sub Station -2007 & Part-VII -DG Sets-2006) as given below:
 - i. 85% after initial inspection and delivery at site in good condition on pro-rata basis.
 - ii. 10% after completion of installation in all respects.
 - iii. Balance 5% will be paid after testing, commissioning and handing over to the client/ HLL for beneficial use.
- B. For other items not covered in the above CPWD Specifications, payment shall be made as per GCC.

34.0 Training of Personnel

The Contractor shall arrange for training of the Client's personnel prior to provisional take over of the project for the following:

- a. Telephone Exchange
- b. All other Equipment like pumps, panels etc.
- c. Adjustment of setting for controls and protective devices
- d. Preventive maintenance

- e. Operation of all electrical panels including their interconnectivity and interlocking scheme
- f. Hot Water Boiler
- g. Any other specialized system as executed under this contract

35.0 Completion Certificate

1. On completion of the installation, a certificate shall be submitted to the Engineer-in-charge /Consultant by the Contractor which shall be countersigned by the agency under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local authority. On the basis of this certificate, the Contractor shall arrange for inspection of installation by the concerned local authorities.
2. The Contractor shall be responsible at his own cost for getting the installation duly approved by the authorities concerned.

36.0 Check List

The Contractor shall provide to the Client/Engineer-in-charge/Consultant , 4(four) copies of a comprehensive maintenance checklist and shall paste a copy of it in the Substations & Plant Room. The checklist shall be a list of each piece of equipment in this Contract, and shall provide a space for each of the next fifty-two weeks to record the maintenance results and status of various equipment each month i.e. at the time of inspection. The Contractor shall certify on this check list that he has examined each piece of equipment and that, in his opinion, it is operating as intended by the manufacturer, and that all necessary tests have been performed.

37.0 Repairs

All equipment that requires repairing shall be immediately serviced and repaired during the defect liability period. All parts and labours shall be furnished free of cost to the client.

38.0 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/Engineer-in-charge/ Consultant. The Contractor should, therefore, employ sufficient staff for watch and ward at his own expenses. Client/Engineer-in-charge/Consultant may, however, allow the Contractor to use the building space for temporary storage of such equipment, if such space is available.

39.0 Testing and Commissioning

The Contractor shall pay for and arrange without any cost to the Engineer-in-charge / Consultant, 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/Consultant. The installation shall be retested after rectification of defects and shall be commissioned only after approval by the Engineer-in-charge /Consultant. All tests shall be carried out in the presence of the Engineer-in-charge /Consultant or his representative.

40.0 Operation and Running of entire system

The contractor shall pay for and arrange for operation & running of entire electrical system

and other equipment for a minimum period of one month after satisfactory completion of work as desired by Engineer-in-charge/ Consultant. Cost of operation & running of entire system including required material e.g. fuel, water ,electricity consumables, tools & tackles, requisite manpower etc. shall be deemed to be included in the contract price and nothing extra shall be paid.

- 41.0** Layout of all services, operating and maintenance instructions. DO's and Don'ts's etc for all the plant rooms, pump room, control panels etc must be equipped with coloured layout of services for the each floor. Operation and maintenance manual of the respective services, Do's and don'ts's for all the plants, machinery & services to be installed with every individual units.

(D) SPECIFIC CONDITIONS OF CONTRACT RELATING TO HVAC SYSTEM**1. Scope of Contract**

The scope and general character of works to be carried out under this section comprises of Supply, Installation, Testing and Commissioning of Heating, Ventilation and Air-conditioning installations as illustrated in drawings, specifications, technical data and Bill of Quantities.

2. 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, Bill of quantities and specifications 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. In case of any discrepancy in the drawings or between the drawings, Bill of quantities and specification, decision of the Engineer-in-charge/Consultant will be final and binding.

3. Supply of Equipment

Equipment shall be strictly as per the list of approved makes/ manufacturers given in the Bid documents. However, final choice of make shall lie with the Engineer-in-charge / Consultant.

- i. The Contractor shall submit manufacturer's test certificates of equipment supplied.
- ii. The Contractor shall submit the original "Excise Paid Certificates", and exit Gate passes form manufacturer's factory/works clearly bearing the batch numbers and date of despatch.

4. Shop / Working Drawings etc.

- 4.1. The Contractor shall prepare and submit to the Engineer-in-charge/Consultant for approval, 2 sets of detailed shop drawings of equipment, equipment characteristics and capacity details of all equipment, accessories and devices etc. as per specifications well in advance or as required by the Engineer-in-charge/Consultant. The structure works should not be affected due to delay on this account. The shop drawings shall be submitted within 15 days of issue of instructions by Engineer - in- Charge. 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.
- 4.2. These drawings shall contain details of construction, size, arrangement, operating clearances, performance characteristics, and capacity of all items of equipment, as also details of all related items of work by other disciplines.
- 4.3. If the Engineer-in-charge/Consultant makes any amendment in the above drawings, the Contractor shall supply two fresh sets of 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 six sets of shop drawings for the exclusive use of and retention by the Engineer-in-charge/Consultant.
- 4.4. 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.

5. Completion Drawings:-

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

- a. Plant installation drawings giving complete details of the entire equipment including AHU's and their foundations.
- b. Ducting drawings showing all sizes, damper 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
- f. Any other drawings to be supplied as per instructions of the Engineer-in-charge / Consultant.

6. Operation and Service Manuals

6.1. The Contractor shall submit 3 (three) 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/Consultant
- ii. Manufacturer's maintenance and operating instruction
- iii. Approved test readings

6.2. The Contractor shall also submit 4 (four) 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 Air conditioning plant room all consolidated control diagrams and all piping diagrams.

6.3. 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.

7. Inspection at Work / Contractor's Premises

7.1. The Client/Engineer-in-charge/Consultant 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.

7.2. 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.

7.3. For Imported screw type water chilling machine manufacturer's factory test certificate would be acceptable in lieu of inspection at manufacturer works.

8. Subcontracting

The Contractor may subcontract part of the works with the written approval of the Engineer-in-charge /Consultant. A single sub-contractor as approved by the Engineer - in- Charge / Consultant 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.

9. Material Submittals

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

- i. Manufacturer's technical catalogues and brochures giving technical data about performance and other parameters
- ii. Manufacturers drawings / sketches showing construction, dimensional and installation details
- iii. Rating charts and performance curves clarifying rating of equipment proposed.

10. Samples and Prototypes

The Contractor shall submit samples of items such as grilles/ diffusers, valves, controls and/ or any other parts or equipment as required by the Engineer-in-charge/Consultant 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 /Consultant. Such samples and prototypes after approval shall be retained by the Engineer-in-charge/Consultant and shall serve as the standards to be achieved in final construction.

11. Testing and Commissioning

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

11.2. 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, pumps, blowers, air handling units, rotating machine, fans, boilers, 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, water, steam 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, 'V' Belt adjustments 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.

11.3. 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/Consultant. The installation shall be tested again after removal of defects if any and shall be commissioned only after approval by the Engineer-in-charge/Consultant. All tests shall be carried out in the presence of the Engineer-in-charge/Consultant or his representative.

12. Provisional Taking Over

12.1. After completion of the HVAC system, the same shall be put to a continuous running test for a period of 72 (Seventy Two) 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 /Consultant.

The plant will be provisionally taken over after successful completion of the above test and the defects liability period shall commence after provisional taking over of the system.

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 as follows:

- i. Peak summer / monsoon test during the period from 15th May to 31st July on the dates decided by Engineer - in- Charge /HLL. The installations should be able to maintain the specified inside temperature/conditions within the tolerance limits prescribed in the Contract the duration of the test shall be 72 hours.
- ii. Peak winter test during the period from 1st December to 15th February on the dates decided by Engineer - in- Charge / HLL. The installations should be able to maintain the specified inside temperature within the tolerance limits permitted in the Contract. The duration of the test shall be 72 hours.

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

14. General

14.1. After provisional taking over of the plant, user / owner shall provide staff for operation. Staff will work under the supervision of the Contractor for proper operation of the plant. This responsibility of the Contractor shall continue till completion of test liabilities with respect to the plant or the maintenance period (twelve months), whichever is later.

14.2. The user shall have the right to operate all equipments, if it is in the operating condition if such equipments, have been accepted as complete and satisfactory. Repairs and alterations if required shall be carried out as and when directed by the Client /Engineer-in-charge/Consultant. In special circumstances Client/Engineer-in-charge /Consultant may request Air conditioning of some areas even before the completion of whole of HVAC work. The Contractor shall co-operate fully under such circumstances.

15. Guarantee and Defects Liability Period

The guarantee of HVAC works shall be valid for a period of 12 (Twelve) months from the date of completion of the project as accepted by Client / Engineer-in-charge/ Consultant. In case the contractor is not able to carry out the seasonal tests (summer/ monsoon & winter) within the stipulated period as mentioned above, the same can be carried out even after defects liability period. The Defect Liability period for HVAC shall be deemed to be extended till satisfactory completion of seasonal tests.

16. 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 + /- 5 % 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 Bill of Quantities 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.

17. Measurement of Works

All works shall be measured in accordance with the mode of measurement given in the specific sections of the specifications. In case the method of measurement for any item is not clarified in the specifications, the same shall be measured in accordance with the relevant IS standards and CPWD norms.

18. Maintenance

The Contractor shall provide free maintenance for a period of **twelve months** after testing and commissioning of the installation of HVAC works or from the date of completion accepted by Client / Engineer-in-charge / Consultant whichever is later. The Contractor shall carry out all routine and special maintenance of the plant and attend to any defects that may arise in operation of the plant.

19. Painting

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

20. Safe Custody and Storage

The contractor shall be responsible for safe custody of all machinery and equipment supplied and installed by the till the final taking over by the Client/Engineer-in-charge /Consultant.

21. Terms of Payment

The following norms shall be followed for the payment of HVAC equipment & installation:

- A. 75% of BOQ rate shall be paid on receipt of equipment at Site and after inspection and passing on pro-rata basis
- B. 10% of BOQ rate shall be paid on satisfactory erection and installation of equipment on pro-rata basis
- C. 10% after successful completion of running tests and provisional taking over.
- D. 5% after final performance and satisfactory seasonal test to be conducted in summer or monsoon and removal of all defects pointed out during previous tests.

22. Training of Personnel

The Contractor shall arrange to train the Client / HLL'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.

23. Operation and Running of entire system

The contractor shall pay for and arrange for operation & running of entire HVAC system for a minimum period of one month after satisfactory completion of work as desired by Engineer-in-charge / Consultant. Cost of operation & running of entire system including required material e.g. fuel, consumables, tools & tackles, requisite manpower etc. shall be deemed to be included in the contract price and nothing extra shall be paid on this account. Only water and electricity shall be provided by the client/HLL.

(E) Special Conditions of Contract for “GRIHA Rating System”

1. This Project is to be executed for Certifications as per GRIHA (Green Rating for Integrated Habitat Assessment) National Green Building Rating System. At least 3 (Three) Star rating under the GRIHA Green Building Rating System is to be ensured. Accordingly, the contractor is required to adhere to the various environment friendly and GRIHA compliance aspects of construction as well as documentation with respect to use of Materials, Manpower, Machinery and other relevant mandatory requirements. Nothing extra shall be payable over and above the quoted rates as per the financial bid to comply with such requirements.
2. To achieve the above, the contractor shall specifically, adhere to the following during construction :
 - 2.1. Soil excavation, soil erosion and sedimentation control etc.:- Proper site management strategies shall be followed on the site to ensure proper material staging, soil spill prevention, soil erosion and sedimentation control. The following strategies are listed below:
 - a. Temporary sedimentation basins shall be made on the lowest possible elevation on site during construction to manage all the storm water generated during rains at the site. Photographs of the sedimentation tank shall be submitted to the Engineer-in-charge.
 - b. Spill prevention and control: Spill prevention and control plans to ensure so as to stop the source of the spill and dispose the contaminated material and hazardous wastes. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.
 - c. Proper construction material staging shall be executed on the site.
 - d. Trenches shall be laid along the periphery of the site to carry the storm water from the various locations on the site to the sedimentation basins.
 - e. During the earth excavation, top soil of 0.20m shall be stacked separately on or near by the site at a maximum height of 0.40m.
 - f. Vegetation / mulching of the areas shall be done where the excavated top soil is stacked.
 - g. The soil excavation, particularly during rainy season, shall be done in such a way to minimize site disturbance such as soil pollution due to spillage of construction material and mixing with rainwater.
 - h. The existing vegetation shall be protected by preventing disturbance or damage to specified areas during construction. This will minimize the amount of bare soil exposed to erosive forces. All existing vegetation shall be barricaded on site and marked on a site survey plan.
 - i. Stacked top soil shall be mulched and protected by barricading as stated above and re-laid over pre-designated landscape areas post construction.
 - 2.2. Proper site management strategies shall be followed on the site to ensure labour safety and sanitation. The some of these are listed below:
 - a. Display warning and safety signs all across the site. Also ensure that safety nets and harnesses are provided for construction workers working on higher floors. The walking boards and formwork shall also be stable. Workers shall be provided with safety equipment like safety helmets, jackets, boots and gloves.
 - b. Provide fire extinguishers and barrels of water with bucket tans on the site and sufficient light for workers to work safely at night.

- c. Provide accommodation and amenities for all staff and labours, employed for the purpose of, or in connection with the contract including fencing, water (both for drinking and other uses), electricity, furniture and other such requirements. Such accommodation and amenities shall be provided by the contractor at a location specifically demarcated by the employer, in case such space is made available by the employer. In case the contractor makes his own arrangement, all such facilities shall be provided in such accommodation. On completion of the contract, such accommodation shall be removed and the site shall be cleared.
- d. The contractor shall employ an officer on the site concerned solely with the safety and protection of all staff and labour against accidents. The officer shall be qualified and shall have authority to issue instructions and take protective measures to prevent accidents. Or the contractor may setup a working arrangement with a local practitioner to handle injury in an emergency situation.
- e. The contractor shall establish a fully equipped first aid centre on site to deal with accidental injuries and workers health. The first aid box shall be marked with a red cross on a white background.
- f. The contractor shall not allow an individual to work on site while his ability or alertness is impaired by fatigue, illness or some other cause which might expose him to injury.

2.3. Proper site management strategies shall be adopted on the site to prevent air pollution viz:

- a. Preparation of site :
 - i. Clear vegetation only from the areas where work will start right away
 - ii. Vegetate/mulch areas where vehicles don't ply
 - iii. Apply gravel to the area where mulching/paving is impractical
 - iv. Identify roads on site that would be used for vehicular traffic. Add surface gravel to reduce source of dust emission
 - v. Limit vehicular speed on site to 10 km/hour
- b. Water shall be sprayed to prevent dust pollution on the following:
 - i. Any dusty materials before transferring, loading and unloading
 - ii. Areas where demolition work is being carried out
 - iii. Areas where excavation or earth-moving activities are to be carried out
 - iv. Arrangements for wheel washing should be made near the entry/exit gates to prevent air pollution
- c. The following activities shall be carried out:
 - i. Providing hoardings/barricading of not less than 3m high along the site boundary, next to a road or other public areas
 - ii. Providing dust screens, sheeting or netting along the perimeter of a building
 - iii. Covering full stockpile of dusty material with impervious sheeting
 - iv. Covering dusty load on vehicles by impervious sheeting before they enter or leave the site
 - v. Transferring, handling/storing dry loose materials like bulk cement, dry pulverized fly ash inside a totally enclosed system

2.4. Concrete Curing: - Use of gunny bags, ponding for curing purposes. Adding admixtures to concrete which cause a reduction in the water required for curing. Also construct curing tanks on the site for efficient usage of water.

2.5. Efficient use of available water

2.6. Plan utilities efficiently and optimize on-site circulation efficiency

2.7. Provide adequate level of sanitation and safety facilities for construction workers

2.8. Reduce air and noise pollution due to storage / use of materials and machinery

- 2.9. Preservation and protection of landscape during construction.
- 2.10. Proper conservation of soil and maintenance of adequate fertility of soil to support vegetative growth.
- 2.11. Reduction in waste of construction materials
- 2.12. Proper storage and disposal of wastes. Dedicated place within the site to be earmarked for storing and sorting construction wastes.
- 2.13. Implement recycling programme as far as possible to recycle construction waste materials during construction
- 2.14. Suitable arrangement for preventing dust and debris entering duct work and working areas
- 2.15. Create physical barriers between work and non-work areas.
- 2.16. Protection of materials and equipment against moisture dust etc.
- 2.17. Keeping work area clean and dry as possible
- 2.18. To take safety measures to avoid damage to existing plants and trees
- 2.19. Materials:-
 - 2.19.1. Use of materials which conform to the GRIHA Rating System criteria.
 - 2.19.2. Use of low emitting materials, adhesives and sealants to -
 - a. reduce / avoid use of materials, which are irritating and naturally cause health problems to the construction workmen and occupants.
 - b. achieve specified Volatile Organic Compounds (VOC) limits as per the requirements given in the **Table-1** & **Table - 2** below :

TABLE – 1

LIST OF ADHESIVES AND SEALANTS :			
SN	Types of Applications	Maximum VOC Limit (g/1)	Suggested vendors
1	Laminate Adhesive	30	Dow Corning/ Cani Merchandizing/ Esson Chemical/ Acqua Mix/ Finolex
2	Wood Flooring Adhesive	100	
3	Ceramic Tile Adhesive	65	
4	Rubber Flooring Adhesive	60	
5	Sub Floor Adhesive	50	
6	Structural Glazing Adhesive	100	
7	Architectural Sealant (<i>Non Porus</i>)	250	
8	Indoor Carpet Adhesive	50	

TABLE - 2

LOW EMITTING MATERIALS PAINTS :		
Interior paints (<i>walls, ceiling, wood polish etc</i>) should conform to the following criteria		
SN	Types of Applications	VOC Limit (g/L)
1	Flats	50
2	Non-flat	150
3	Anti rust paints	250
4	Varnish	350
5	Lacquer	550
6	Floor Coatings	100
7	Waterproofing sealers	250

- The contractor shall maintain proper record of all the materials/ equipment procured with respect to their source & specifications with details of their manufacturing and recycled content etc. and submit along with all supporting documents to the Engineer-In-charge.
- Construction Waste Management Plan :**
As already detailed, the broad intent is to avoid materials going to landfills, during construction. It is required to develop a plan to recycle all possible waste generated during construction. Typical items would include land clearing debris, concrete, steel, ductwork, clean dimensional wood, paperboard and plastic used in packing, etc.

The plan should include where these materials will be sent to and the mode of transportation also. Donation of construction waste to other buildings for use is also deemed as having addressed the intent of this credit. The contractor should have a system to document the disposal of construction waste.

5. **Indoor Air Quality (IAQ) Management plan.**

The contractor shall be required to take the specific measures during construction with respect to following main areas of concern:

a. HVAC System Protection :

- When performing construction activities that produce dust, such as drywall sanding, concrete cutting, masonry work, wood sawing or adding insulation, seal off the supply diffusers and return air system openings completely for the duration of the task.
- Shut down and seal off the supply diffusers and return air ducts during any demolition operations
- Till the HVAC system is put into use, seal-off the supply diffusers and return air system openings to prevent the accumulation of dust and debris in the duct system during construction.
- Do not use the mechanical rooms to store construction or waste materials. Keep rooms clean and neat.
- Provide periodic duct inspections during construction; if the ducts become contaminated due to inadequate protection, clean the ducts as per requirements and directions of Engineer-In-Charge

b. Contaminant Source Control:

- Use low VOC products as indicated by the specifications to reduce potential problems
- Restrict traffic volume and avoid idling of motor vehicles as their emissions could be drawn into the building
- Utilize electric or natural gas alternatives for gasoline and diesel run equipment where possible and practical. Use low-sulphur diesel in lieu of regular diesel
- Cycle equipment off when not being used or needed
- Exhaust pollution sources to the outside with portable fan systems
- Prevent exhaust from re-circulating back into the building
- Keep containers of wet products closed as much as possible. Cover or seal containers of waste materials that can release odor or dust.
- Protect stored on-site or installed absorptive building materials, for instance, Cement, Gypsum/ POP etc. from weather and moisture; wrap with plastic and seal tight to prevent moisture absorption.

c. Pathway Interruption:

- Provide dust curtains or temporary enclosures to prevent dust from migrating to other areas including existing, Hospital Complex, where applicable.
- Locate pollutant sources as far away as possible from supply ducts and areas occupied by workers when feasible. Supply and exhaust systems may have to be shut down or isolated during such activity.
- During construction, isolate areas of work to prevent contamination of clean or occupied areas. Pressure differentials may be utilized to prevent contaminated air from entering clean areas.

- Depending on weather, ventilation using 100% outside air will be used to exhaust contaminated air directly to the outside during use of VOC emitting materials.

d. Housekeeping:

- Provide regular cleaning concentrating on HVAC equipment and building space to remove contaminants from the building prior to occupancy.
- All coils, air filters, fans & ducts shall remain clean during installation and, if required, will be cleaned prior to performing the testing, adjusting and balancing of the systems.
- Suppress and minimize dust with wetting agents or sweeping compounds. Utilize efficient and effective dust collecting methods such as a damp cloth, wet mop, or vacuum with particulate filters, or wet scrubber.
- Remove accumulations of water inside the building. Protect porous materials such as insulation and ceiling tile from exposure to moisture.
- Thoroughly clean all interior surfaces prior to replacing filters and running HVAC system for system balancing, commissioning and building flush-out.

e. Scheduling and Construction Activity Sequence:

Schedule high pollution activities that utilize high VOC level products (including paints, sealers, insulation, adhesives, caulking and cleaners) to take place prior to installing highly absorbent materials (such as ceiling tiles, gypsum wall board, fabric furnishings, carpet and insulation, for example).

6. **Photographs :**

During various stages of construction, the photographs shall be taken by contractor and submitted to the Engineer-In-charge, showing details of specific requirements / measures being taken by the contractor towards above for documentary compliance and records.

7. Contractor shall coordinate with suppliers of various materials and equipment to be procured by him for use in works and provide all required details with respect to their manufacturing facilities; raw materials etc as per requirements of GRIHA Certification guidelines. Preference should be given to GRIHA compliant products/ materials.

VENDOR LIST TO BE ANNEXED WITH THIS GCC & SCC VOLUME