INDIAN INSTITUTE OF TECHNOLOGY INDORE

SIMROL, KHANDWA ROAD, INDORE 453552

www.iiti.ac.in

TENDER DOCUMENT
FOR

Electrification work of Hub Building at IIT Indore

Tender No. **IITI/ES/PR/E/HUB/NIT/03/2016-17**

INDEX

INDIAN INSTITUTE OF TECHNOLGY INDORE

NOTICE INVITING TENDER

On behalf of Indian Institute of Technology (IIT) Indore; sealed item rate tenders are invited from the contractors registered with C.P.W.D/ State PWD/ MES/ Railways/ IIT's/ IIM's/ NIT's/ IISER's, Semi Govt. organization agencies satisfying eligibility criteria for

Name of the work: - "ELECTRIFICATION WORK OF HUB BUILDING AT IIT INDORE."

Estimated cost of the work	₹ 29.44 Lakhs (Based on the CPWD–DSR for the Year 2014 & Non-DSR on market rates.) (Rupees Twenty Nine Lakh Forty Four Thousand Only)
Earnest Money	**₹ 60,000/-** (Rupees Sixty Thousand Only)
Time for completion of work	3 Months

1 Tender can be downloaded from IIT Indore website http://www.iiti.ac.in/tender.php from December 27, 2016 to January 5, 2017 upto 05:00 PM.

1.1 The cost of Tender document is ₹1000/- (Rupees One Thousand) and the same is payable at the time of submission of tender document, in the form of demand draft / pay order drawn in favour of "Registrar, Indian Institute of Technology Indore" payable at Indore. (Cost of tender documents is non-refundable)

1.2 NIT, GCC, SCC, Technical specifications along with BOQ of the work to be executed and the set of Tender drawings is available on the institutes website and tenderer will have to submit the tender cost in the form of Demand draft along with duly filled tender documents of the work to be executed and the set of Tender drawings at Project in-charge office, Estate Section, Indian Institute of Technology Indore, Simrol campus Indore 453552 (Madhya Pradesh) on or before 15.00 hrs. of January 6, 2017 between 09.00 hrs and 16.00 hrs. on all working days (except Saturdays, Sundays / Public Holidays).

2 Eligibility conditions for vendor to qualify for participation into the competition bidding. Documentary evidence shall be submitted for:

2.1 Production of the definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar nature of works of during the last 5 years with following conditions.

2.1.1 Magnitude costing of one work not less than ₹ 24.0 Lakhs OR

2.1.2 Magnitude costing of two works not less than ₹ 18.0 Lakhs OR

2.1.3 Magnitude costing of three works not less than ₹ 12.0 Lakhs

2.2 Proof of latest valid contractor license & registration certificate with the Government /semi Government organization, for the amount not less than estimated value of the work.

2.3 Proof of latest submission of Income Tax returns for the last 3 financial years as on 31/03/2016 along with copy of PAN/TIN No.

2.4 Contractor must have a minimum average financial turnover of Rs.10.00 Lakhs (Rupees Ten Lakhs Only) on construction work during last three financial years.

2.5 Contractor must have a minimum solvency of ₹ 12 Lakhs. Solvency Certificate is need by Scheduled form to be produced in original.

2.6 The contractor should not have incurred loss in more than two years during the last five years ending March 2016.

3 Joint venture companies would not be allowed to participate.

4 The tender(s) shall be accompanied by the earnest money **₹ 60,000 /-** in the form of demand draft / pay order of a schedule bank issued in favour “Registrar, Indian Institute of Technology Indore” payable at Indore.

5 The each and every page of tender documents should be sealed & signed by authorized person of the firm/ contractor while submitting the tender.

6 The time allowed for carrying out the work shall be 3 months reckoned from the 10th day after the date of written orders to commencement of the work.

7 Tenders is a three bid system and should be submitted in one sealed envelope, superscripting the name of work and due date. The tenders will be received in the office of the Project -in-charge, Indian Institute of Technology Indore, Khandwa Road, Simrol, Indore 453552 (Madhya Pradesh) only up to 15.00 hrs. of January 6, 2017 and shall be opened on the same day at 15.30 hours in presence of the tenderer's representative who may be present at the stipulated time & venue of tender opening with proof of representing the company.

8 The tenderer(s) shall submit tenders in three sealed covers.

8.1 The first envelope shall contain the tender fee and earnest money deposit in the manner as indicated.

8.1.1 In case, 1st cover tender fee and earnest money is not in proper form, the tenders shall be summarily rejected.

8.2 The second envelope should contain the tender document along with the eligibility documents. Please refer FORMS 'A' To 'F' of section III of tender.

8.3 The third envelope shall contain the financial bid (Price bid/BOQ).

8.3.1 Financial bid will be opened of that vendor, who qualify in technical & eligibility criteria in first bid.

8.3.2 Date of opening of financial bid will be announced later through e-mail to the shortlisted tenderer only.

9 No Pre – bid meeting would be held for this tender, however if there is any queries regarding to this tender, the bidder may e-mail his queries on the given mail id pic@iiti.ac.in for the same upto 11:00 am of January 2, 2017. IIT Indore reserves the right to modify the tender condition, if need be and which will form a part of tender. Information regarding any changes / corrigendum will be uploaded on the website of IIT Indore.

10 Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the ground and sub-soil, the form and nature of the site, the means of access to the site and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tenderer shall be deemed to have full knowledge of the site once the tender is submitted. No extra charges consequent upon any misunderstanding or otherwise shall be allowed. The tenderer

shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access facilities for the workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents.

11 Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant etc will be issued to him and local conditions and other factors having a bearing on the execution of the work.

12 The competent authority on behalf of, Indian Institute of Technology Indore, does not bind itself to accept the lowest or any other tender, and reserves the right to reject any or all of the tenders received without assigning any reasons thereof. Tenders in which any of the prescribed conditions are not fulfilled or any condition including that of the conditional rebate put forth by the tenderer shall be summarily rejected.

13 Canvassing in any form whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.

14 The higher authority of IIT Indore reserves the right of accepting the whole or any part of the tender and the tenderer shall be bound to execute the same at the rates quoted.

15 No engineer of gazetted rank or other gazetted officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of two years after his retirement from Government service, without the previous permission of the Government of India in writing. The contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the Government of India aforesaid before submission of the tender or engagement in the contractors service.

16 The tender for the work shall remain open for acceptance for a period of 30 days from the date of opening of tenders. If any tenderer withdraws his tender before the said

period or makes any modifications in the terms and conditions of the tender which are not acceptable to the IIT Indore or its authorized representative shall, without prejudice to any other right or remedy be liable to forfeiture of the said earnest money absolutely.

Address for Communication:

Project-In-Charge
For and on behalf of Director, Indian Institute of Technology, Indore
IIT, Indore
Simrol Campus
Pin- 453552
e-mail id: pic@iiti.ac.in

General Information & Instruction

Name of work: - "ELECTRIFICATION WORK OF HUB BUILDING AT IIT INDORE"

Estimated cost : ₹ 29.44 Lakhs

EMD: ₹ 60,000/-

Cost of Tender : ₹ 1000 /-
Document

Completion Time : 03 Months from date of Acceptance

If any queries can be accepted : January 2, 2017 (Upto 11:00 am)
On or before

Tender Submission : Upto 3:00 pm of January 6, 2017

Tender opening date: At 3:30 pm of January 6, 2017

Financial Bid Opening Date: To be intimated to technically qualified bidders only.

Contact Details:

Name : Mr. S.S. Pawar (Project In-charge)
Address : Estate Office, PHY-2, POD3, IIT Indore,
Simrol Campus, Indore - 453552
E-mail ID : pic@iiti.ac.in

1. **The Project:** The WORK OF ELECTRIFICATION OF HUB BUILDING AT IIT INDORE CAMPUS, SIMROL, INDORE. The HUB building is G + 1 Floor and area within 2,000 sq. Meters.

2. **Scope of work :** The general character and the scope of work to be carried out under this contract are illustrated in Drawings, Specifications and Schedule of Quantities. The Contractor shall carry out and complete the said work under this contract in every respect in conformity with the contract documents and with the direction of and to the satisfaction of the Owner's site representative. The contractor shall furnish all labour, materials and equipment (except those to be supplied by the owner) as listed under Schedule of Quantities and specified otherwise, transportation and incidental necessary for supply, installation, testing and commissioning of the complete electrical system as described in the Specifications and as shown on the drawings. This also includes any material, equipment, appliances and incidental work not specifically mentioned herein or noted on the Drawings/Documents as being furnished or installed, but which are necessary and customary to be performed under this contract. The electrical system shall comprise of (but not limited to) the following:
    a. All conduit work including junction boxes, outlet boxes and wiring for lighting and power circuit in HUB building.
    b. Switches, plug sockets, cover plates and other wiring accessories.
    c. Cables for Mains and Sub-Mains.
    d. Main LT panels, Metering Panel, Main Distribution / Sub Distribution panels, Final Distribution panels.
    e. Cables on cable trays including installation, cable trays, hangers, supports, cable terminations and all fixing accessories.
    f. Earthing (Grounding) System.
    g. Race way is required for ELV cabling in corridor areas.
    h. Lightning Protection System.
    i. Supply and installation of Lighting Fixtures.
    j. Supply & Installation of Feeder pillars etc.
    k. Supply and installation of conduiting & cabling for Telephone & fire alarm system.
    l. Commissioning of the system as a whole.

m. Submission of all requisite test certificates, as built drawings.
n. Warranty Certificates of all Panels, breaker, MCBs, light, fan, switches/sockets etc.
o. Ferruling must be required in All DB's sub main panel, leveling.
p. Nomenclature must be proper in DB's. Sub main DB's, main panel, etc.
q. SLD must be pasted on main panel with load details, cable size, bus bar rating, CT, PT ratio, MCCB, MCB etc.
r. All test certificates of equipments which include panels & switchgears must be submitted.

3. **Responsibilities of Contractor:** To execute the work as per specification and drawings and direction of project-in-charge of IIT Indore**.**

a. The details of work to be carried out are given in the "Schedule and Bill of Quantities". The Tenderers are advised to study the same carefully before tendering and they shall be deemed to have fully acquainted themselves with the same.

b. The Tenderers, in their own interest, are also advised to inspect and examine the site and its surroundings and satisfy themselves, before submitting their tenders, in respect of the site conditions including but not restricting to the following which may influence or affect the work or cost thereof under the contract.

(i) Site conditions including access to the site, existing and required roads and other means of transport / communication.

(ii) Requirement and availability of land and other facilities for his enabling works facilities, stores and workshops etc.

(iii) Geological, meteorological, topographical and other general features including levels of the site and its surroundings as are pertaining to and needed for the performance of the work.

(iv) All other information pertaining to and needed for the work including information as to the risks, contingencies and other circumstances which may influence or affect the work or the cost thereof under this contract.

c. The Employer will not be responsible and will not reimburse any expenses which may be incurred or losses to person or property suffered by any Tenderer in connection with visits to and examination of the site and in the preparation of his tender for submission.

d. Tenderers should note that information, if any, as regards to the site and local conditions, as contained in these tender documents has been given merely to assist Tenderers and is not deemed to be complete.

e. Tenderers should note and bear in mind that the Employer shall bear no responsibility for the lack of acquaintance of the site and other conditions or any information relating thereto, on their part. The consequences of the lack of any knowledge, as aforesaid, on the part of Tenderers shall be at their risk and cost and no charges or claims whatsoever consequent upon the lack of any information, knowledge or understanding shall be entertained or payable by the Employer either during tender stage or during the construction period.

f. The Quoted rates in the Tender document (BOQ) shall include

(i) All charges for clearing of site before commencement as well as after completion, electric consumption, meters including fencing, hoarding, plant and equipment, storage sheds, watching and lighting by night, as well as day, including Sundays and holidays, temporary electric supply, protection of the public and safety of adjacent roads, streets, cellars, vaults, ovens, pavements, walls, houses, buildings, and all other erections, matters or things and the Contractor shall take down and remove any or all such centering, ., as required or when ordered to do so, and fully reinstate and make good all matters and things disturbed or damaged during the execution of work and to the satisfaction of the Engineer-in-Charge. The rates quoted shall be deemed to be for the finished work to be measured at site. The rates shall also be firm and shall not be subject to exchange variations, labour conditions, fluctuations in octroi, local taxes, railway freights or any conditions whatsoever.

(ii) All materials, fixing materials, accessories, operations, appliances, tools, plant, equipment, transport, labour and incidentals required in preparation

for in the full and entire execution and completion of the work called for in the item and as per Indian Standard Specifications and drawings.

(iii) Waste on materials and labour.

(iv) Loading, transportation, unloading, handling/ double handling, hoisting to all levels, setting, fitting and fixing in position, protecting, disposal of debris and all other labours necessary to fully complete the job in accordance with the Contract Documents, good practice and recognized principles. This also includes materials, appliances, equipment and accessories not specifically mentioned herein or noted in the drawings/ documents as being furnished or installed but which are necessary and customary to make complete installation in efficient working order.

(v) The Contract Price/ rates shall be deemed to include excise duty, sales tax, octroi/ entry tax, ESI and PF obligations which shall be paid extra as applicable and all other taxes, duties and levies, tax on Works Contract, etc.

(vi) No electricity connection shall be provided by the owner and the contractor shall make his own arrangements for the electricity. The Contractor shall provide at his own cost all necessary connections, fitting etc., for the execution of work. No claims for failure of electricity due to its intermittent /inadequate supply due to breakdown or other causes shall be admissible.

(vii) No water shall be issued to the contractor and the contractor shall make his own arrangement for water supply at the site.

(viii) Service tax, If applicable, would be reimbursed by IIT Indore on the production and submission of definite proof of having paid the service tax specifically for this contract.

g. The successful Tenderer shall be liable to pay the turnover tax or such other taxes on the work under the contract as and when levied by the State/Central Government Authorities and the Employer shall not entertain any such claims, whatsoever in this respect.

h. The Contractor shall not be entitled to any compensation for any loss suffered by him on account of delays, in commencing or executing the work, whatever the cause of delays may be, including delays arising out of modifications to the work entrusted to him or in any sub-contract connected therewith or delays in

awarding contracts for other trades of the project or in commencement of completion of such works or in procuring Government controlled or other building materials or in obtaining water and power connections for construction purposes or for any claim in respect thereof. The Employer does not accept liability for any sum towards loss of overheads and profits of the contractor besides the tender amount, subject to such variations as are provided for herein.

i. The Contractor shall include the following information and documents:

(i) A detailed construction program showing the Tenderer's proposed sequence of operation together with the estimated time for all major activities such as basements, masonry work, finishing work, preparation of shop drawings, construction/manufacture, delivery, erection and commissioning of equipment, etc., in phased requirements, if any. The Contractor shall adhere to the Schedule generally given in the tender. The Engineer-in-Charge may at his discretion modify the program after review from time to time.

(ii) Full details of any special methodology or technique the Tenderer proposes to use for the construction or for any other purpose.

(iii) The Tenderer's proposals for supervising his work, including the CV's of the various grades of technical & supervisory personnel/other staff proposed to be deployed during the construction period.

(iv) Schedules of labour requirements showing category wise breakup of the labour force, for construction period.

(v) Proposal for major construction facilities to be erected on the site including workshops, offices, storage areas and testing laboratories.

(vi) List of proposed sub-contractors/associates, if any, along with their credentials in respect to the trades of works together with their full addresses.

(vii) The Tenderer shall attach to his tender a copy duly authenticated by a Notary, of the documents containing the constitution of company, or firm by which the Tender is submitted so as to indicate by what persons and in what manner a contract may be entered by the consortium, company or firm and what persons would be directly responsible for the due performance of the Contract and can give valid receipt on behalf of the consortium, company or firm.

(viii) List of the equipment to be erected/ installed at the site for timely

completion of the works.

(ix) All addenda/ corrigenda, if issued by the institute, duly signed and stamped by the Tenderer as a token of consideration of the effects of such addenda in the tender documents.

j. For certain items if alternatives have been provided for in the Bill of Quantities, the institute reserves the right to use either of the alternative items fully or partly solely at their discretion. This is irrespective of the institute's right to vary the quantity of the various items substantially. No claim in this respect shall be entertained.

k. Submission of the late bid document will be rejected.

l. Comparison of the financial bid is based on lowest price (L1) and work will be awarded accordingly.

m. Period of the validity of Bid is 90 days.

n. In case of withdrawal of bid, the earnest money will be retained.

SECTION – I

General Conditions of Contract

GENERAL CONDITIONS OF CONTRACT

Definitions:

1. The **contract** means the documents forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of the Director, Indian Institute of Technology Indore and the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.

2. In the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them :-

    i. Similar nature of work shall mean projects comprising of modern Institutional / Hospital / University / Educational / Industrial building of minimum G+1 in nature along with all electrical specialized services.

    ii. The expression **works** or **work** shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.

    iii. The **Site** shall mean the land/ or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.

    iv. The **Contractor** shall mean the individual, firm or company, whether incorporated or not, undertaking the works shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.

v. The **Director**, Indian Institute of Technology Indore means his successors also.

vi. The **Project In –charge or** his Subordinate Engineer is engineer in charge who shall supervise and be in-charge of work and who shall act on behalf of the Director, IITI for execution of contract.

vii. **IITI** means Indian Institute of Technology Indore.

viii. **Accepting Authority** shall mean the authority mentioned in Schedule 'F'.

ix. **Excepted Risk** are risks due to riots (other than those on account of contractor's employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, military or usurped power, any acts of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by IIT Indore of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to IIT -Pane's faulty design of works.

x. **Market Rate** shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the site where the work is to be executed at site. It covers all necessary taxes, duties, fright charges as per WCT and contractors overheads and profits.

xi. **Schedule(s)** referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Rates of the CPWD Delhi schedule of rates mentioned in Schedule `F' hereunder, with the amendments thereto issued up to the date of receipt of the tender.

xii. **Department** means Estate Section of Indian Institute of Technology Indore. (IIT Indore)

xiii. **Specifications** means the specifications contained in tender documents, CPWD specifications 2013 Vol I & II with up to date correction slips, Indian standard specification as applicable in the area where the work is to be executed & relevant IEC & IEEE standards wherever applicable.

xiv. **Tendered Value** means the value of the entire work as stipulated in the letter of award.

xv. **Consultant** means Consultant appointed by the Indian Institute of Technology Indore.

xvi. **Date of commencement of work:** The date of commencement of work shall be the first day of handling over the site or within 10 days of work award whichever is later.

xvii. The work shall be completed in **03 months** from the date of start.

3. **SCOPE AND PERFORMANCE**
   Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa

4. Headings and Marginal notes to these General Conditions of Contract (CPWD) shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.

5. The contractor shall be furnished one certified copy of the contract documents free of cost except for standard specifications. Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.

6. **WORK CAN BE CARRIED OUT:** The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of quantities shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.

7. **SUFFICENCY OF TENDER**: The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.

8. **DISCREPANCIES AND ADJUSTMENT OF ERRORS**: The several documents forming the contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special clauses in preference to general clauses.

   A. In the Case of discrepancy between the schedule of quantities the specifications and / or the drawings following order of the preferences shall be observed:-
      i. Description of schedule of quantities.
      ii. Particular specifications and special clauses, in any.
      iii. Drawings,
      iv. Departmental specifications,
      v. C.P.W.D. Specifications.
      vi. Indian Standard Specification of the B.I.S.

   B. If there are varying or conflicting provision made in any one document forming part of the contract, the accepting authority shall be the deciding authority with regard to the intension of the document and his decision shall be final and binding on the contract.

   C. Any error in description, quantity or rate in schedule of quantities or any permission thereof shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to drawings and specification or from any of his obligation under the contract.

Tenders have been invited on the basis of Standard Forms and General Conditions of Contract for works in Central Public Works Department (CPWD) However in the context of IIT Indore, the following terms may be read as:-

Sr. no.	Name of concerned authority as per GCC	To be read as
1	For & on behalf of President of India	Board of Governors, IIT Indore
2	Engineering -in-charge	Project- in charge , IIT Indore
3	Director general	Director, IIT Indore
4	Department	IIT Indore
5	Central Public works Department	IIT Indore
6	Chief engineer CPWD	Project –In charge , IIT Indore

CLAUSES OF CONTRACT

CLAUSE – I

Performance Guarantee

1. The contractor shall submit an irrevocable Performance Guarantee of 5% (Five percent) of the tendered amount in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Schedule 'F' from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in-Charge up to a maximum period as specified in schedule 'F' on written request of the contractor stating the reason for delays in procuring the Performance Guarantee, to the satisfaction of the Engineer-in-Charge. This guarantee shall be in the form of Deposit at call receipt of any Schedule Bank/Banker's Cheque of any Schedule Bank/Demand Draft of any Scheduled Bank/Pay Order of any Scheduled Bank or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the form annexed hereto. In case a fixed deposit receipt of any Bank is furnished by the contractor to the IIT Indore as part of the performance guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the IIT Indore to make good the deficit.

2. The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 60 days beyond that. In case the time for completion of work gets extended, the contractor shall get the validity of Performance Guarantee extended to cover such extended time for completion of work. After recording of the completion certificate for the work by the competent authority, the Performance Guarantee shall be returned to the contractor, without any interest.

3. The Engineer-in-Charge shall not make a claim under the Performance Guarantee except for amounts to which the Director IIT Indore is entitled under the contract (not withstanding and / or without prejudice to any other provisions in the contract agreement) in the event of:-

   (a) Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance Guarantee.

   (b) Failure by the contractor to pay Director IIT Indore any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions of the agreement, within 30 days of the serving of notice to this effect by Engineer-in-Charge.

4. In the event of the contract being determined or rescinded under provision of any of the Clause / Condition of the agreement, the Performance Guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Director IIT Indore.

CLAUSE – I A

Recovery of Security Deposit :-

The person/persons whose tender(s) may be accepted (hereinafter called the contractor) shall permit IIT Indore at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 5% of the gross amount of each running bill till the sum along with the already deposited sum as earnest money, will amount to security deposit of 5% of the tendered value of the work. Such deductions will be made and held by IIT Indore by way of Security Deposit unless he/ they has/have deposited the amount of Security at the rate mentioned above in the form of Government Securities or fixed deposit receipts. In case of

fixed deposit receipt of any Bank is furnished by the contractor to the IIT Indore as part of the security deposit and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the Director IIT Indore to make good the deficit.

All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising there from, or from any sums which may be due to or may become due to the contractor by IIT Indore on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in cash or fixed deposit receipt tendered by the State Bank of India or by Scheduled Banks or Government Securities (if deposited for more than 12 months) endorsed in favour of the Director IIT Indore, any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof. The security deposit shall be collected from the running bills of the contractor at the rates mentioned above and the Earnest money deposited at the time of tenders will be treated as part of the Security Deposit.

The security deposit as deducted above can be released against bank guarantee issued by a Scheduled Bank, on its accumulations to a minimum of ₹ 5 Lakh subject to the condition that amount of such bank guarantee, except last one, shall not be less than ₹ 5 lakh.

CLAUSE -2

Compensation for Delay:-

If the contractor fails to maintain the required progress in terms of clause 5 or to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to the IIT Indore on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated below as the authority specified in schedule 'F' (whose decision in writing shall be final and binding) may decide on the amount of tendered value of the work for every completed day/month (as applicable)

that the progress remains below that specified in Clause 5 or that the work remains incomplete.

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

(i)	Compensation for Delay of work	@1.5% per month of delay computed on per day basis.

Provided always that the total amount of compensation for delay to be paid under this Condition shall not exceed 10% of the Tendered Value of work or of the Tendered Value of the item or group of items of work for which a separate period of completion is originally given.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the IIT Indore. In case, the contractor does not achieve a particular milestone mentioned in schedule F, or the re-scheduled milestone(s) in terms of Clause 5.4, the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of Extension of Time. With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

CLAUSE– 2A

Incentive for Early Completion:-Not Applicable

CLAUSE– 3

When Contract can be Determined: **Powers of Engineers in Charge**

Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and/ or any other provisions of

this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

a. If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or improper workmanship manner shall omit to comply with the requirement or such notice for a period of seven days thereafter.

b. If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.

c. If the Contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge.

d. If the contractor persistently neglects to carry out his obligations under the contract and / or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.

e. If the contractor shall offer or give or agree to give to any person in IIT Indore service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for IIT Indore.

f. If the contractor shall obtain a contract with IIT Indore as a result of wrong tendering or other non-bonafide methods of competitive tendering.

g. If the contractor being an individual or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his

estate made against him or shall take any proceeding for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or compositions or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.

h. If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle to make the court to make winding up order.

i. If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.

j. If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer-in-Charge.

k. If the work is not started by the contractor within 1/8th of the stipulated time.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the Director IIT Indore shall have powers:

i. To determine the contract as aforesaid (of which termination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the IIT Indore.

ii. After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-

executed out of his hands and to give it to another contractor to complete the work at the risk and cost of the original contractor. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

CLAUSE–3A Closure of contract on non – commencement of work

In case, the work cannot be started due to reasons not within the control of the contractor in accordance with clause 5.2 within 1/8th of the stipulated time for completion of work, either party may close the contract. In such eventuality, the Earnest Money Deposit and the Performance Guarantee of the contractor shall be refunded, but no payment on account of interest, loss of profit or damages etc. shall be payable at all.

CLAUSE– 4

Contractor liable to pay compensation even if action not taken under clause 3:-

In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause–3 thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires

after giving a notice in writing to the contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work/or any part thereof, paying or allowing for the same in account at the contract rates or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expense of any such sale shall be final and conclusive against the contractor.

CLAUSE– 5

Time and Extension for Delay :-

The time allowed for execution of the Works as specified in the Schedule `F' or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in Schedule 'F' or from the date of handing over of the site whichever is later. If the contractor commits default in commencing the execution of the work as aforesaid, IIT Indore shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the Earnest Money & Performance Guarantee absolutely.

5.1 As soon as possible after the contract is concluded, the contractor shall submit a Time and Progress Chart for each mile stone and get it approved by the IIT Indore. The chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and

may be amended as necessary by agreement between the Engineer-in-Charge and the contractor within the limitations of time imposed in the contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (except for special jobs for which a separate program has been agreed upon) complete the work as per mile stones given in Schedule 'F'.

5.2 If the work(s) be delayed by :-

i) Force majeure, or
ii) abnormally bad weather, or
iii) serious loss or damage by fire, or abnormal floods
iv) Civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or.
v) Delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the Contract, or
vi) Any other cause which, in the absolute discretion of Engineer-in-Charge is beyond the Contractor's control.

Then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.

5.2.1 Request for rescheduling of Mile stones and extension of time, to be eligible for consideration, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay on the prescribed form. The contractor may also, if practicable, indicate in such a request the period for which extension is desired.

5.2.2 In any such case the Engineer-in-Charge may give a fair and reasonable extension of time and rescheduled the mile stones for completion of work. Such extension shall be communicated to the Contractor by the Engineer-in-Charge in writing, within 3 months of the date of receipt of such request. Non application by the contractor for

extension of time shall not be a bar for giving a fair and reasonable extension by the Engineer-in-Charge and this shall be binding on the contractor.

CLAUSE– 6A

Computerized Measurement Book:-

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract.

All measurements of all items having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per format of the IIT Indore so that a complete record is obtained of all the items of works performed under the contract.

All such measurements and levels recorded by the contractor or his authorized representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorized representative as per interval or program fixed in consultation with Engineer-in-Charge or his representative. After the necessary corrections made by the Engineer-in-Charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the Engineer-in-Charge for the dated signatures by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance.

Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked/ test checked from the Engineer-in-Charge and / or his authorized representative. The contractor will, thereafter, incorporate such changes as may be done during these checks / test checks in his draft computerized measurements, and submit to the IIT Indore a computerized measurement book, duly bound, and with its pages machine numbered. The Engineer-in-Charge and / or his authorized representative would thereafter checks this MB, and record the necessary certificates for their checks / test checks.

The final, fair, computerized measurement book given by the contractor, duly bound, with its pages machine numbered, should be 100% correct, and no cutting or over-

writing in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly machine numbered and bound, after getting the earlier MB cancelled by the IIT Indore. Thereafter, the MB shall be taken in the IIT Indore Office records, and allotted a number as per the Register of Computerized MB's. This should be done before the corresponding bill is submitted to the IIT Indore Office for payment. The contractor shall submit two spare copies of such computerized MB's for the purpose of reference and record by the various officers of the IIT Indore.

The contractor shall also submit to the IIT Indore separately his computerized Abstract of Cost and the bill based on these measurements, duly bound, and its pages machine numbered along with two spare copies of the bill. Thereafter, this bill will be processed by the IIT Indore Office and allotted a number as per the computerized record in the same way as done for the measurement book meant for measurements.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements / levels by the Engineer-in-Charge or his representative.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available then a mutually agreed method shall be followed.

The contractor shall give, not less than seven days' notice to the Engineer-in-Charge or his authorized representative in charge of the work, before covering up or otherwise placing beyond the reach of checking and/or test checking the measurement of any work in order that the same may be checked and/or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and/or test checking measurement and shall not cover up and place beyond reach of measurement any work without consent in

writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and/or test checking measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing, the same shall be uncovered at the contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

It is also a term of this contract that checking and/or test checking the measurements of any item of work in the measurement book and/ or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE– 8

Completion Certificate and Completion Plans :-

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice, the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or(b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/ their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and

sanitary arrangements as aforesaid and cleaning of dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding surplus materials and rubbish etc. and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

CLAUSE- 8A

Contractor to Keep Site Clean

Where the work is done without waiting for the actual completion of all the other items of work in contract. In case the contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor either departmentally or through any other agency. Before taking such action, the Engineer-in-Charge shall give **10** days' notice in writing to the contractor.

CLAUSE- 8B

Completion Plans (as built drawing) to be Submitted by the Contractor :-

The contractor shall submit completion plan as required vide General Specifications for Electrical works (Part-I Internal) 2012 and (Part-II External) 2012 as applicable within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent to 2.5% of the value of the work subject to a ceiling of ₹15,000 (Rupees Fifteen Thousand Only) as may be fixed by the Engineer-in-Charge concerned and in this respect the decision of the Engineer-in-Charge shall be final and binding on the contractor.

CLAUSE- 9

Payment of Final Bill :-

The final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-

Charge whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Engineer-in-Charge, will, as far as possible be made within the period specified herein under, the period being reckoned from the date of receipt of the bill by the Engineer-in-Charge or his authorized Asst. Engineer/Representative, complete with account of materials issued by the IIT Indore and dismantled materials.

i).If the Tendered value of work is up to ₹ 15 lakhs:3 months

ii).If the Tendered value of work exceeds ₹15 lakhs:6 months

CLAUSE- 9A

Payment of Contractor's Bills to Banks :- Deleted

CLAUSE- 10

Materials to be provided by the Contractor

The contractor shall at his own cost provide all materials required for the works. The contractor shall, at his own expenses and without delay, supply to Engineer-in-charge samples of materials to be used on the work and shall get these approved in advance, All such materials to be provided by the contractor shall be in conformity with the specifications laid down or referred to the contract. The contractor shall, if requested by the Engineering-in-charge furnish proof, to the satisfaction of the Engineering-in-charge that the materials so comply.

CLAUSE- 10 A

Secured Advance on Non-Perishable Materials: - -DELETED

CLAUSE-10B

Mobilization Advances:--DELETED

Plant Machinery & Shuttering Material Advance :--DELETED

Interest and Recovery:--DELETED

CLAUSE10-C

Payment on Account of Increase in Prices / Wages due to Statutory Order(s) :-

-DELETED

CLAUSE– 10CA

Payment due to Variation in Prices of Materials after receipt of tender:-

-DELETED

CLAUSE– 10 CC

Payment due to Increase / Decrease in Prices / Wages after Receipt of Tender for Works

-DELETED

CLAUSE- 10D

Dismantled material IIT -Indore Property:-

The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc as IIT Pane's property and such materials shall be disposed off to the best advantage of IIT Indore according to the instructions in writing issued by the Engineer-in-Charge.

CLAUSE– 11

Work to be Executed in Accordance with Specifications, Drawings, Orders etc.:-

The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in the standard specifications of Central Public Works Department specified in Schedule `C' or in any Bureau of Indian Standard or any other, published Standard or Code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract.

The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified. The contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

CLAUSE- 12 :

Deviations/Variations Extent and Pricing:-

CLAUSE- 13

Foreclosure of Contract due to Abandonment or Reduction in Scope of Work :-

If at any time after acceptance of the tender, IIT Indore shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-Charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment or compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

CLAUSE- 15

Action in case Work not done as per Specifications:-

All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-in-Charge, his authorized subordinates In charge of the work and all the superior officers, officer of the Quality Assurance Unit of the IIT Indore or any organization engaged by the IIT Indore for Quality Assurance and Chief Technical Examiner's Office of The Central Vigilance Commission of India, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible

agent duly accredited in writing, present for that purpose. Orders given to the contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-Charge or his authorized subordinates In charge of the work or to the in charge of Quality Assurance or his subordinate officers or the officers of the organization engaged by the IIT Indore for Quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality interior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within twelve months (six months in case of the work costing ₹10 Lac and below except road work) of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under Clause 2 of the contract (for non-completion of the work in time) for this default.

In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the authority specified in Schedule 'C' may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/ or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

CLAUSE- 17

Contractor to Supply Tools & Plants etc. :-

The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), machinery, tools & plants as specified in Schedule' C' In addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specification or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his so doing the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

The contractor need to submit all test and calibration certificates of testing instruments before engaging it at the site.

CLAUSE 20:

Minimum Wages Act to be complied with:

The Contractor shall comply with all the provisions of the Minimum Wages Act, 1948, and Contract Labour (Regulation & Abolition) Act, 1970, amended from time to time and rules framed there under and other labour laws affecting contract labour that may be brought into force from time to time.

CLAUSE 21 :

Work not to be sublet. Action in case of insolvency -

The Contract shall not be assigned or sublet without the written approval of the Engineer-in-Charge. And if the contractor shall assign or sublet his contract, or

attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or persons in the employ of IIT Indore in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the Director IIT Indore shall have power to adopt the courses specified in Clause 3 hereof in the interest of IIT Indore and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.

CLAUSE 28 :

Action where no Specifications are specified -

In case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standard Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per Manufacturer's Specifications, In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

CLAUSE 34:

Employment of Technical Staff and Employees

Contractors Superintendence, Supervision, Technical Staff & Employees

(i) The contractor shall provide all necessary superintendence during execution of the work and all along thereafter as may be necessary for proper fulfilling of the obligations under the contract.

The contractor shall immediately after receiving letter of acceptance of the tender and before commencement of the work, intimate in writing to the Engineer-in-Charge, the name(s), qualifications, experience, age, address(s) and other particulars along with certificates, of the principal technical representative to be in charge of the work and other technical representative(s) who will be supervising the work. Minimum requirement of such technical representative(s) and their qualifications and experience shall not be lower than specified in Special Condition of contract. The

Engineer-in-Charge shall within 3 days of receipt of such communication intimate in writing his approval or otherwise of such a representative(s) to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the contractor shall appoint another such representative(s) according to the provisions of this clause. Decision of the tender accepting authority shall be final and binding on the contractor in this respect. Such a principal technical representative and other technical representative(s) shall be appointed by the contractor soon after receipt of the approval from Engineer-in-Charge and shall be available at site before start of work.

All the provisions applicable to the principal technical representative under the Clause will also be applicable to other technical representative(s). The principal technical representative and other technical representative(s) shall be present at the site of work for supervision at all times when any construction activity is in progress and also present himself/themselves, as required, to the Engineer-in-Charge and/or his designated representative to take instructions. Instructions given to the principal technical representative or other technical representative(s) shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and other technical representative(s) shall be actually available at site fully during all stages of execution of work, during recording/checking/test checking of measurements of works and whenever so required by the Engineer-in-Charge and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative(s) in the site order book and shall affix his/their signature in token of noting down the instructions and in token of acceptance of measurements, checked measurements/test checked measurements. The representative(s) shall not look after any other work. Substitutes, duly approved by Engineer-in-Charge of the work in similar manner as aforesaid shall be provided in event of absence of any of the representative(s) by more than two days.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative(s) is/are effectively appointed or is/are effectively attending or fulfilling the provision of this Clause, a recovery (non-refundable) shall be effected from the contractor as specified in Schedule `C' and the decision of the Engineer-in-Charge as recorded in the site order book shall be final and binding on the contractor. Further if the contractor fails to appoint suitable technical Principal technical representatives and/or other technical

representative(s) and if such appointed persons are not effectively present or are absent by more than two days without duly approved substitute or do not discharge their responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is/are appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) along with every on account bill/ final bill and shall produce evidence if at any time so required by the Engineer-in-Charge.

ii) The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work.

The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work.

The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconduct himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer-in-Charge and the persons so removed shall be replaced as soon as possible by competent substitutes.

SECTION – II

Special Conditions of Contract

SPECIAL CONDITIONS OF CONTRACT

S. No.	GCC Clause No.	Clause Name	Details & Descriptions
1.	-	-	**DUTIES & POWERS** i) DIRECTOR: The Director or its officer on his behalf have full right to make any changes in the work as per requirement as it is an urgent work. ii) SITE ENGINEERS: Duties of the Site Engineer(s) are to watch and supervise the works and workmanship employed in connection with the works, and to test and examine any materials to be used. He shall have no authority to relieve the contractor of any of his duties or obligations under the contract or, except as expressly provided here under, to order any work involving delay or any extra payment by the Institute, nor to make any variation in the works. The Engineer in charge from time to time in writing, delegate to the Site Engineer (s) any of the powers and authorities vested in them. Any written instruction or written approval given by the Site Engineer (s) to the contractor within the terms of such delegation (but not otherwise) shall bind the contractor and the institute as though it had been given by the Engineer-in Charge/Architect provided always as follows: a) Failure of the Site Engineer(s) to disapprove any work or materials shall not prejudice the power of the Engineer In-charge to subsequently disapprove such work or materials and to order the pulling down, removal or breaking up or redoing the job thereof. b) If the contractor is dissatisfied by reason of any decision of the Site Engineer(s), he shall be entitled to refer the matter to the Engineering-in charge, who shall there upon confirm reverse or vary such decision.
2.	CLAUSE -21	**WORK NOT TO BE SUBLET.ACTION IN CASE ON INSOLVENCY**	**ASSIGNMENT & SUBLETTING** The contractor shall not assign the contract or any part thereof or any benefit or interest therein or there under without the written consent of the Engineer In-charge. The whole of the works included in the contract shall

			be executed by the contractor except where otherwise provided in the contract. The contractor shall not sublet any part of the works without the written consent of the Engineer In-charge and such consent, if given, shall not relieve the contractor from any liability or obligation under the contract, and he shall be responsible for the acts, defaults and neglects of subcontractor, his agents, servants or workmen, as if they were the acts, defaults or neglects of the contractor provided always that the provision of labour contracts on a piece work basis shall not be deemed to be a subletting under this clause.
3.	10 CC	**PAYMENT DUE TO INCREASE OR DECREASE IN PRICES /WAGES AFTER RECIEPT OF TENDER FOR WORKS**	Clause 10 (c) (c) of the General Conditions of Contract for CPWD Works- 2010 with up to date corrections slip Incorporating corrections up-to DGWICONI2OB shall not be applicable.
4.	11	**WORK TO BE EXECUTED IN ACCORDANCE WITH SPECIFICATIONS, DRAWINGS, ORDERS etc.**	**INTENT OF SPECIFICATIONS** It is not the intent of Technical Specifications to completely specify all aspects of design and construction features of equipment and all details of work to be carried out Nevertheless the intent of the Technical Specification is to ensure that the equipment and the work shall fully comply with and conform to the relevant Bureau of Indian Standard Specification Codes of Practice, Indian Electricity Act, Indian Electricity Rules and other Statutory Regulations as may be applicable and to the best available standards of engineering, design and workmanship. The equipment and Work shall perform in manner acceptable to Owners who shall interpret meaning of the applicable Specifications/Codes and shall have the right to reject equipment or work, which, in their assessment, is not complete to meet the ‘‘Standard/Code.
5.	-		**CONTRACT DOCUMENT** **a.**The several documents, forming the contract, are to be taken as mutually explanatory of one another and in case of ambiguities or discrepancies the same shall be explained and adjusted by the Engineer-in-charge who shall there upon issue to the contractor its interpretation directing in what manner the work is to be carried out. In case the contractor feels aggrieved by the interpretation of the Institute then the matter shall be referred to the Director IIT Indore and his decision shall be final, conclusive and binding on both parties to the contract.

			b.The drawing etc. shall remain in the custody of the Institute. Two complete sets of specification and Bill of Quantities shall be furnished by the Engineer-in charge to the contractor in such time, which must not delay the progress of the construction, and the Institute shall furnish copies of any additional document, which in their opinion may be necessary for the execution of any part of the work. One complete set shall be kept on the work site and the Engineer-in-charge and his representatives shall be, at all reasonable times, have access to the same. The contractor shall study the documents thoroughly before the commencement of work. In case of any discrepancy, the contractor shall seek clarification before proceeding with the works. Figured dimensions are in all cases to be accepted in preference to the scaled sizes. Large-scale details shall take preference over small scale ones. The contractor shall give adequate notice in writing to the Engineer-in charge of any further or specification that may be required for the execution of the works or otherwise under the contract. The Engineer-in-charge shall have full powers and authority to supply to the contractor from time to time during the progress of the work such instructions as shall be necessary for proper execution and the contractor shall carry out and be bound by the same. **c.**The successful tenderer shall be required to enter into an agreement with the Institute, The Bill of Quantities & rates filled by the successful tenderer there in, the General Conditions of Contract for CPWD Works with up to date corrections slip incorporating corrections up to, CPWD specifications for Civil & Electrical Works, the Special conditions, additional specifications, negotiation letter and the award letter etc. shall form part of the agreement to be signed by the successful tenderer. The cost of stamp paper and stamp duty, required for the agreement, shall be borne by the contractor. **d.**Commercial tax on works Contract as per prevailing notification of M.P. Government shall be recovered from the contractor s bills.
6.	-	-	**CONTRACT AGREEMENT** contract agreement, inclusive of its enclosures, shall remain in the custody of the Officer Authorized by Director, IIT Indore and be made available by him as and when required. Contractor shall however be supplied, an attested copy thereof, free of cost.

7.	-		**WATER AND ELECTRICITY** a. **Water** Contractor has to make his own arrangements for water. He may bore Tube well and pump water at his own cost. No charges for using underground water shall be levied, the contractor has to ensure that water conforms to IS 456 and makes necessary arrangement for treating water if required to make it suitable for construction. b. **Electricity** The contractor Will have to make his own arrangement for electricity, either by taking Temporary Electric connection from the local authority or by using DG sets.
8.	17	**CONTRACTOR TO SUPPLY TOOLS & PLANTS**	**EQUIPMENT, COMPONENTS AND MATERIALS** **a. Quality** All material and equipment used in work shall be new and of best available quality conforming to the relevant Indian Standard Specifications. Owners reserve the right to reject any item, which in their assessment is second hand .All material which will be installed should be as per ISI Specification and wherever applicable, it should have test /calibration certificate. **b. Samples** All material and equipment used on work shall be got approved by Engineer-in Charge prior to use on work Samples / Literature of items , as directed, shall be got approved from Engineer-in Charge prior to use on work. **c. List of Recommended makes** List of Recommended make in respect of important terms is enclosed which shall form part of this contract. Makes other than those Recommended in the list may be used only after taking approval in writing from Engineer –in Charge of work. Engineer –in Charge will have discretionary authority for such changes. **d. Manufacture's Instruction** Where manufacturers have furnished specific Instructions, relating to the materials used in this Job, covering points not specifically mentioned in these documents, manufacturer's Instructions shall be brought to the notice of the Engineer-In-charge for further Instructions in the matter. **e. Interchange Ability** All similar parts and / or equipment shall be interchangeable with one another. **f. Material Testing**

			The Engineer-in-charge shall have full powers to require any material used in work to be tested by an independent agency in order to prove its soundness and adequacy. Testing Charges shall be borne by the contractor in all respect of samples qualifying the test. **g. Inspection at manufacturer's works** Prior to shipment of equipment, the Engineer-In charge reserves the right to inspect the equipment at Manufacture's Works. Contractor shall provide and secure every reasonable access and facility at Manufacturer's Works for this Inspection for the Owner/ Architect/ Authorized representative. **h. Guarantee /Warrantee** The entire work executed under this contract shall be guaranteed against manufacturing defects and/or bad workmanship for a period of one year after the date of contractual completion. Any defect arising out of reasons attributable to manufacturing defect and/or bad workmanship, in the assessment of owner shall be rectified/replaced to the satisfaction of owner free of cost to owner during the guarantee period.
9.			All material required for the work shall be arranged by the contractor on his own cost. No material shall be supplied by the Institute except where specifically mentioned in Schedule 'C'.
10.			All entries by the tenderer should be made in one ink and single handwriting only. Tenders should be filled in legible handwriting and should not contain erasures, Corrections and overwriting as far as possible. However if it becomes necessary, each correction etc. should be properly attested under dated signature.
11.	-		**LICENSE & WORKMANSHIP** The contractor has to maintain valid electrical license throughout period of work. The supervisor and workman deployed should have relevant valid electrical license. Good workmanship is an essential prerequisite to be complied for this work. Entire work shall be carried out in the most workmen like manner by skilled workers under competent supervision. Contractor had to submit the copy of electrical license.
13.	-		**TEMPORARY STRUCTURE** Labour hutment shall be allowed in the campus at predefined location. The contractor shall before start of work submit drawing for the labour hutments; store for construction materials etc. with the key plan showing approved location to the Engineer –in- Charge for approval. The contractor shall have to make proper

			sewage disposal arrangement No sewage water shall be allowed to flow in the natural water courses passing through the campus
14.	**12**	**DEVIATION/VARIATION EXTEND & PRICING**	**VALUATION OF VARIATIONS** All deviations, variations referred to in Clauses of the General Conditions of Contract and any additions to the Contract Value which are required to be determined in accordance with this Clause shall be valued at the rates and prices calculated as follows: a. If the rates for the additional, altered or substituted work are specified in the Contract, the Contractor shall carry out the work at the same rates. b. If the rates for the additional, altered, or substituted work are not specified in the Contract, then such rates shall be derived from the rates specified in a Contract for a similar kind of work. c. If the rates for the additional, altered, or substituted work cannot be derived from similar kind of work, then the same shall be computed on the basis of the Analysis of Rates as provided in the latest SCHEDULE OF RATES published by the local public works department or the latest CPWD ANALYSIS OF RATES at the discussion of Engineer-in-charge. d. If the rates for the additional, altered or substituted work cannot be determined in the manner specified in the paragraphs (a), (b) or (c) above, then the rates for such work shall be worked out on the basis of actual consumption of materials, labour and equipment used as detailed below: i. Cost of materials delivered at site at prevalent market rates to be decided by Engineer in Charge ii. Direct cost of labour and equipment at market rates prevailing at the time of provision thereof iii. Contractor's Overhead and profit calculated at ten per cent of the cost of materials and labour [(I) and (ii)] which shall include direct and indirect establishment, sundries and contingencies, overheads, T&P, water and the Contractor's profit iv. Trade tax on Works and Service Tax on labour, as and if, applicable. The Final rate payable to the Contractor shall be the sum of costs vides paragraphs (i), (ii) (ii) and (iv). In the event of disagreement the Engineer-in-charge shall fix such rates as are in his pin on appropriate and shall notify the Contractor accordingly. Until such time as rates are agreed or fixed, the Engineer-in-

			charge shall determine provisional rates to enable on account payments to be included in certificates issued in accordance with Clause mentioned.
15.	-	-	1. The contractor shall take prior approval for engaging specialized agencies for specified works .The decision of Engineer-in-charge for particular work of being specialized job shall be final and binding in GCC. 2. The Engineer-in-charge shall have full rights to terminate the specialized agency so selected if the performance is not found satisfactory at the time of execution. 3. The decision of Engineer-in-charge in respect of engagement of specialized agency shall be final and binding to the contractor.
16.	-	-	Contractor shall maintain on site the necessary instruments and relevant accessories in perfect working condition to enable the Engineer-in charge or his representative to check the work at all times.
17.	-	-	The contractor(s) shall give to the Municipality, police and other authorities all necessary notices etc. that may be required by law and obtain all requisite licenses for temporary obstructions, enclosures etc. and pay all fee, taxes and charges which may be levied on account of these operations in executing the contract. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain lights either for illumination or for cautioning the public at night.
18.	-	-	Contractor(s) shall provide temporary bench marks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of the work. All such reference points shall be in relation to the levels and locations, given in the Architectural and other related services drawings.
19.	-	-	After completion of work, the Contractor(s) shall submit at his own cost four prints of “as built’ drawings to the Engineer-in-Charge within 4 weeks of completion of the work.
20.	-	-	The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-in-Charge and shall as far as possible arrange his work and shall place and dispose of the materials being used or removed, so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform

			it in proper sequence to the complete satisfaction of others.
21.	-	-	**SAFETY HEALTH AND ENVIRONMENT** (i) The Contractor(s) shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night, speed limit boards, red flags, red lights and providing barriers hording written in English and Hindi. He shall be responsible for all damages and accidents caused to existing/new work due to negligence on his part. No hindrances shall be caused to traffic during the execution of the work. In case of any accident of labours / contractual staff's the entire responsibility will rest on the part of the contractor and any compensation under such circumstances if becomes payable the same shall be entirely born by the contractor and department shall have no role on this account. (ii) The contractor is required to follow the CPWD Safety code as prescribed in the General condition of the contract 2010 with correction up to November 2011. (iii) Hazardous and / or toxic materials such as solvent coating or thinners shall be stored in appropriate containers. (iv) Contractor shall ensure that during the performance of the work, all hazard to the health of personnel, have been identified, assessed and eliminated. (v) Appropriates personal protective equipments such as helmets, gloves, goggles, aprons, safety belts etc. shall be provided to the workers employed at the work site as per the requirement and exposure to the hazardous materials or locations. (vi) The contractor has to follow the model rules the protections of the Health and sanitary arrangement for the workers as provided in the General Condition of the contract 2010 with correction up to November 2011. (vii) The contractor shall provide first aid facilities, drinking water facilities, washing facility, Latrines and urinals, shelter during rest, crèches, canteens, anti-malarial precautions, preventive action for communicable diseases, proper drainage, sewerage, etc. in compliance of model rules for the protection of Health and

			Sanitary arrangement for the workers.
22.	-	-	The contractor will take reasonable precaution to prevent his workmen and employees from removing and damaging any flora (plant/ vegetation) from the project area.
23.	**5**	Time & Extension For delay	The Contractor shall prepare an integrated program chart for the execution of work, showing clearly all activities from the start of work to completion. The contractor shall submit weekly progress report of the work in computerized form.
24.	-	-	If the work is carried out in more than one shift or during night, no claim on this account shall be entertained. The contractor has to take permission from the police authorities etc. if required for work during night hours. No claim / hindrance on this account shall be considered if work is not allowed during night time.
25.	-	-	The scope of work shall consist of cost of all materials, labour including supervision, installation, calibration, adjustments as required for commissioning of the all works as per scope. The term complete installation shall mean, not only, major item of the plant and the equipments covered by these specifications, but also, incidental sundry components necessary for complete execution and satisfactory performance of installation with all labour charges, whether or not specifically mentioned in the tender documents, which shall be provided by the contractor at no extra cost.
26.	-	-	The contractor shall give a satisfactory performance test of installations individually and as a whole to ensure their proper functioning before the work is finally declared and completed and accepted.
27.	-	-	The contractor shall continue to maintain watch and ward to safeguard the Owner's property in this possession until the same is formally handed over as per directions of the Engineer- in charge. Nothing extra over agreement rates shall be paid on this account.
28.	-	-	The contractor shall be responsible for all statutory provisions and deductions towards ESI, PF, or any other, as the case may be or other levies and taxes shall be borne by the contractor. TDS and contract tax or any other statutory levels/taxes incorporated from time to time shall be deducted progressively from the running account bills as applicable at the time of payment. No claim in this regards shall be entertained.
29.	-	-	No extension of time shall be granted to the contractor on account of rains or inclement weather conditions.
30.	-	-	Indian Electricity rules 1956 are applicable for execution of work.

31.	-	-	The works shall be executed on the basis of the following CPWD specifications: Electrical Works: CPWD General specifications for Electrical works Part I (Internal), Part II (External) up to date If the specification of an item is not contained in the above CPWD specifications or Additional Specification, the relevant BIS code shall be followed unless specified otherwise. Vendor take prior approval from engineer-in charge
32.	-	-	**AWARD CRITERIA** 35.1 The Institute reserves the right to: a) Amend the scope and value of contract to the bidder. b) Reject any or all the bids without assigning any reason. 35.2 Effort on the part of the bidder or his agent to exercise influence or to pressurize the Institute for his bid shall result in rejection of such bid. Canvassing of any kind is pro Habited.
33.	-	-	If the bid of the successful bidder is seriously unbalanced in relation to the estimate of the cost of the work to be performed under the contract, the IIT may require the bidder to produce detailed price analysis for any or all items of the bills of quantities, to demonstrate the internal consistency of these prices with the construction method, and schedule proposed.
34.	-	-	**DRAWINGS** The contractor shall examine all architectural, structural, plumbing, HVAC and other services drawings and check the GFC drawings/ tender drawings before starting the work and report to the Owner's site representative any discrepancies and obtain clarification. Any changes found essential to coordinate installation of his work with other services' GFC Drawings are provided by consultant at the time of execution the work.
35.	-		**ACCESSIBILITY** The Contractor shall verify the sufficiency of the size of the shaft openings, clearances in wall cavities and suspended ceilings for proper installation of his conduits cables, cable trays, panels etc. His failure to communicate insufficiency of any of the above shall constitute his acceptance of sufficiency of the same. The Contractor shall locate all equipment which must

			be serviced, operated or maintained in fully accessible positions. The exact location and size of all access panels, required for each concealed control damper, valve or other devices requiring attendance, shall be finalized and communicated in sufficient time, to be provided in the normal course of work. Failing this, the Contractor shall make all the necessary repairs and changes at his own expense. Access panel shall be standardized for each piece of equipment / device / accessory and shall be clearly nomenclature / marked.
36.	-	-	**COMPLETION CERTIFICATE** The completion of the electrical installation a certificate shall be furnished by the Contractor counter signed by the licensed supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local, state/central govt./ municipal / fire authorities concerned, if required.
37.	-		**COMPLETION DRAWINGS** On completion of the work and before issuance of certificate of virtual completion the contractor shall submit to the Owner's site representative four sets of layout drawings in progressive manner for individual systems drawn at approved scale indicating the complete wiring system as installed. Drawings shall be prepared on AUTO-CAD (latest version). Along with the hardcopies, the contractor shall submit copies of all drawings on CD and one set of all drawings on RTF shall also be submitted. These drawings must provide: a. All power distribution panel layout. b. Single line power distribution diagram including control wiring. c. Cable Trays with number and size of cables installed. d. Run and size of conduits, inspection, junction and pull boxes. e. Raceway & Junction Boxes and DLP f. Number and size of conductors in each conduit with phase identification. g. Location and rating of sockets and switches controlling the lighting and power outlets. h. Location and details of distribution boards/panels, mains, switches along with phase balancing details. i. A complete wiring diagram as installed and

			single line diagrams showing all connections in the complete electrical system. j. Location of all earthing stations, route and size of all earthing conductors manhole. k. Layout and particulars of all cables. l. Instruction, maintenance and operation manuals including maintenance schedule for all equipment. Testing & commissioning reports of all electrical equipment.
38.	-		**OPERATING INSTRUCTION & MAINTENANCE MANUAL** Upon completion and commissioning of part Electrical system the contractor shall submit a draft copy of comprehensive operating instructions, maintenance schedule and log sheets for all systems and equipment included in this contract. This shall be supplementary to manufacturer's operating and maintenance manuals. Upon approval of the draft, the contractor shall submit four (4) complete bound sets of typewritten operating instructions and maintenance manuals; one each for retention by Consultant and Owner's site representative and two for Owners Operating Personnel. These manuals shall also include basis of design, detailed technical data for each piece of equipment as installed, spare parts manual and recommended spares for 4 year period of maintenance of each equipment.
39.	-		**ON SITE TRAINING** Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labour and helpers for operating the entire installation as deemed necessary Chief Engineer in Charge, to enable the Owner's staff to get acquainted with the operation of the system. During this period, the contractor shall train the Owner's personnel in the operation, adjustment and maintenance of all equipment installed.
40.	**13**	**FORCLOUSER OF CONTRACT DUE TO ABANDOMENT OR REDUCTION IN SCOPE OF WORK**	**FORECLOSURE OF CONTRACT** **1.** If at any time after the commencement of work, the Employer shall, for any reason whatsoever, not require the whole or part of the works specified, the Employer shall give notice in writing to the Contractor who shall have no claim to any payment of compensation, whatsoever on account of any profit or advantage which he might have derived from the execution of work in full but which he did not derive in

			consequence of the full amount of work not having been carried out. The Contractor shall be paid at Contract rates full amounts for the works executed at Site and in addition a reasonable amount as certified by the "Employer" for the following which could not be utilized on the work to the full extent because of the foreclosure: **2.**The amount payable in respect of any preliminary items so far as the work or service comprised therein has been carried out and a proper proportion, as certified by the "Employer", of any such items, the work or service comprised, which has been partially carried out or performed. **3.**Cost of materials reasonably ordered for the works which shall have been delivered to the Contractor or which the Contractor is legally liable to accept delivery. **4.** A sum to be certified by the "Employer" being the amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the works in so far as such expenditure shall not have been covered by the payments made to the Contractor. **5.** Provided that against any payments due from the Employer under the clause, the Employer shall be entitled to be credited with any outstanding balances due from the Contractor for any advances in respect of materials and otherwise and any other sum which on the date of foreclosing was recoverable by the Employer from the Contractor under the terms of Contract.

41.	-		**CANCELLATION OF CONTRACT ON DEFAULT OF CONTRACTOR** **1.** If the Contractor shall become bankrupt, or being a corporation, shall go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction), or if the Contractor shall assign the Contract without the consent in writing of the Employer first obtained, or shall have an execution levied on his goods or if in the opinion of the "Employer" the Contractor. 1.1 Has abandoned the Contract, or 1.2 Without reasonable excuse has suspended the progress of the Works for one month after receiving from the "Employer" written notice to proceed, or 1.3 Despite previous warnings by the "Employer", in writing, is not executing the Works in accordance with the Contract, or is persistently or flagrantly neglecting to carry out his obligation under the Contract, or 1.4 Has in defiance of the Employer's instructions to the contrary, sublet any part of the Contract, then the Employer may, after giving fourteen days notice in writing to the Contractor, determine the Contract, and enter upon the Site and Works without releasing the Contractor from any of his obligation or liabilities under the Contract, or affecting the rights and powers conferred on the Employer by the Contract and may either himself complete the Works or may employ any other Contractor, to complete the Works. The Employer may use for such completion so much of the said constructional Plant, temporary Works and materials, which may have been deemed to be exclusively for the execution of the Works under the provisions of the Contract, as the Employer may think proper; and the Employer may at any time sell any of the Construction Plant, Temporary Works and unused materials and apply the proceeds of sale in or towards the satisfaction of any sums due or which may become due to the Employer from the Contractor under the Contract.

			2.The "Employer" shall, as soon as may be practicable, after any such determination, fix and determine ex-party, or by or after reference to the Contractor and shall certify what amount, if any, had at the time of such determination reasonably accrued to the Contractor and the value of any of the said unused or partially used materials, any Constructional Plant and any Temporary works. **3.**If Employer determines the Contract under this clause, he shall not be liable to pay the Contractor any money on account of the Contract until the expiration of the Guarantee period and thereafter until the cost of execution and maintenance, rectification of defects, damages for delay in completion, and all other expenses incurred by the Employer have been ascertained. The Contractor shall then be entitled to receive only such sum or sums, if any, as the "Employer" may certify would have been payable to him upon due completion by him after deducting the said amounts. The Contractor shall be paid accordingly.
42.	-		**ARBITRATION (1998 INDIAN ARBITRATION & COUNCIL ACTS)** **1.**During the pendency of arbitration proceedings, the Contractor shall not stop working. The Contractor shall endeavor to finish the work within the stipulated time. **2.**Any difference, dispute, controversy or claim (Dispute) which may arise between the parties hereto out or in relation to or in connection with this agreement, or the break termination, effect, validity, interpretation or application of this agreement or as to their rights, duties or liabilities hereunder other than a dispute for which provision is specifically made in this agreement, shall be settled by the parties by mutual negotiations and agreement. If, for any reason such dispute cannot be resolved amicably by the parties hereto within 60 calendar days of the Dispute being notified by one party to the other, the same shall be settled by way of arbitration proceedings by arbitrators, one to be nominated by each of the contractor and Employer and the third to be appointed by the two arbitrators so appointed. The arbitration proceedings

			shall be held in accordance with Arbitration and Conciliation Act, 1998, or any subsequent enactment or amendment thereto ("the Arbitration Act"). Each of the Contractor and EMPLOYER shall appoint an arbitrator within (30) days of the receipt by such party of the other party's request to initiate arbitration. The two arbitrators so appointed shall then jointly appoint a third arbitrator within (30) days of the date of appointment of the second arbitrator which third arbitrator shall act as the Chairman of the tribunal. Arbitrators not appointed within the time limit set forth in the preceding sentence shall be appointed in accordance with the Arbitration Act. The decision of the arbitrators shall be final and binding upon the parties. The venue of the arbitration shall be IIT Indore. The language of the arbitration and the award shall be English. **3.**Subject to the preceding clause, the parties agree to submit to the exclusive jurisdiction of the competent courts in Indore with regard to any question or matter arising out of this agreement and other documents that may be executed by the parties in pursuance hereto or arising here from.
43	-	-	Institute reserves the right to curtail or enhance the scope of work either by deletion of certain items entirely or by reducing/ increasing the quantities of certain items as required and reviewed by the Institute from time to time and therefore, the final value of the work shall be worked out and paid to the extent of work actually carried out.
44	-	-	As per requirement, IIT Indore reserves the right to execute any or part of work by its own, and the same amount may be recovered / deducted from the running or final bill of the contractor, as the case may be.
45	-	-	With regards to the financial bids if there is a discrepancy between amount in figure and amount quoted in text, then the lowest of either will be applicable

For and on behalf of Director, IIT Indore

SECTION – III

- **Schedule**
- **Forms & Procedure**

SCHEDULE- 'A'

Attached as Bill of Quantities along with tender document

SCHEDUL -'B'

Schedule of material to be issued to the contractor

S. no	Description of Item	Quantity	Rates in Figure & words at which the material will be charged to the contractor	Place of issue
1	2	3	4	5
---------- Nil ----------				

SCHEDULE- 'C'

Tools and plants to be hired to the contractor

S. no	Description	Hire charges per day	Place of issue
1	2	3	4
---------- IIT Indore will not provide any tools and plants----------			

SCHEDULE- 'D'

Extra schedule for specific requirement /document for the work if any:- NIL

SCHEDULE- 'E' -DELETED

SCHEDULE- 'F'

Reference to General Conditions of Contract.

Name of the work: - Electrification work of HUB Building for Simrol IIT Indore.

I. Estimated cost of work : ₹ 29.44 Lakhs
II. Earnest Money: ₹ 60 Thousand
III. Performance Guarantee: 5% of tendered value to be deposited within 7 days of work award.
IV. Security Deposit: 5% of tendered value. To be deducted from each bills proportionately.
V. Schedule of Rates: based on DSR 2014 And Market Rates.
VI. Time Of Completion: **03 Months** from the date of commencement

GENERAL RULES & DIRECTIONS:-

Officer inviting tender:- Project-in-charge, IIT Indore on behalf of Director, IIT Indore

Accepting authority:- Director, IIT Indore

LETTER OF TRANSMITTAL

From:
(Full Address of the Applicant)

To:
Project -in-charge,
Indian Institute of Technology Indore,
Khandwa Road, Simrol, Indore, M.P. 453552

SUB:- Submission of eligibility document for the "ELECTRIFICATION WORK Of HUB BUILDING AT IIT INDORE CAMPUS, SIMROL

Sir,

Having examined the details given in Notice Inviting Tender published in the newspapers and bid documents for the above work, we hereby submit the eligibility documents and financial bid documents.

1. We hereby certify that all the statements made and information supplied in the enclosed forms A to H are true.

2. We have furnished all information and details necessary for eligibility document and have no further pertinent information to supply.

3. We submit the requisite certified **Solvency Certificate** and authorize IIT Indore to approach the Bank issuing the solvency certificate to confirm the correctness thereof. We also authorize Project -in-charge; IIT Indore to approach individuals, employers, firms and corporation and to visit the works completed by us in the past or are in progress at present, to verify our competence and general reputation.

Enclosures:nos.
Date of submission:Signature of Applicant

Enclosures:
1. Tender Form
2. Forms 'A' to 'I'
3. Envelop 1 – EMD and Tender Fee
4. Envelop 2 – Technical & Eligible Documents
5. Envelop 3 – Financial Bid/Price Bid (BOQ)

TENDER FORM

I/We have read and examined the notice Inviting Tender, Schedule, Specifications applicable, General Rules and Directions, Conditions of Contract, clauses of contract, special conditions, Schedule of Rate & other document and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the Director of Indian Institute of Technology Indore (IIT-Indore) within the time specified in schedule 'F' viz, schedule of quantities and in accordance in all respects with the specifications, and instructions, with such materials as are provided for and in respects in accordance with such conditions so far as applicable.

We agree to keep the tender open for ninety (90) days from the due date of its opening and not to make any modifications in its terms and conditions.

A sum of Rs (figure) **₹ 60,000/-** (in words) Rupees Sixty Thousand Only
has been deposited in the form of demand draft of a scheduled bank/DD issued by a Schedule Bank as earnest money.

If I/we fail to furnish the prescribed performance Guarantee within the prescribed period, I/we agree that the said Director of Indian Institute of Technology Indore (IIT Indore) or his successors in his office shall without prejudice to any other right or remedy , be at liberty to forfeit the said earnest money absolutely, if i/we fail to commence work as specified, I/we agree that Director Of Indian Institute of Technology Indore (IIT –Indore) or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and Performance Guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, up to maximum of the percentage mentioned in the General conditions of contract and those in excess of that limit at the rates to be determined in accordance with the provision General conditions of contract.

Further, I/We agree that in case of forfeiture of earnest money as aforesaid, I/We shall be debarred for the participation in the re-tendering process of the work.

I/We hereby declare that I/we shall treat the tender documents drawings and other records connected with the work as secret/ confidential documents and shall not communicate information / derived there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the state or IIT Indore.

Dated ……. Signature of Contractor
Postal Address

Seal

Witness:
Address:
Occupation:
Name and Address:

APPENDIX TO TENDER FORM

1	Earnest Money Deposit		60 Thousand Only
2	Possession of Site		Immediately on award of work.
3	Date of Commencement		10 days after the issue of letter of intent or date of handing over of site whichever is later.
4	Time of completion		**03 Months** from the date of Acceptance
5	Terms of Payment		a) 60 % on delivery of material at site in good condition. b) 15% on installation. c) 15% on testing and commissioning. d) 10% after Defect Liability Period
6	Interim Bills/ Payments		**Maximum one bill a month** Minimum bill value-20% of the contract sum 75% of the RA bill shall be released within 15 days of submission after certification by site engineer / Engineer-in-Charge and balance within 15 days thereafter
7	Final Bill/ Payment		Final bill shall be paid within 60 days after submission of all necessary documents and their due verification at site. All interim bills and final bill shall be accompanied by relevant documents as per the attached list.
8	Defect Liability Period		Defect liability period shall be 12 months from the date of handing over of **Electrical works** after commissioning.
9	Escalation and Statutory Variation		Irrespective of any provision, no escalation in rates/prices shall be admissible for this work on any account.
10	Performance Guarantee		Bank Guarantee of 5% of Contract value valid upto completion of DLP Period to be submitted by the Vendor on acceptance.
11	Retention Security Deposit		5% Of Gross Interim payment/final payment
12	Release of Retention Amount		After Defect Liability Period
13	Electricity & Water		To be arranged by contractor at his own cost
14	Taxes & Duties		All Government taxes and duties to be included in the bid price.

List of documents to be submitted along with bills

1. Joint Measurement taken and recorded in MB Book and duly signed by the Contractor and Junior / Asst. Engineer (E) of the IIT Indore.
2. Contractor's All Risk Policy (Applicable during the tenancy of work)
3. Three (3) Sets as built drawings.
4. Warranty and Test certificates of the brought in items, if applicable.

FORM OF ACCEPTANCE

The above tender(as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf Director Of Indian Institute of Technology Indore (IIT - Indore) for sum of Rs…….
(Rupees……
……..

The letters referred to below shall form part of this contract Agreement:-

(a)

(b) For & on behalf of the Director, IIT Indore

Signature……..

Dated……..

FORM 'A'

FINANCIAL INFORMATION

I. **Financial Analysis** – Details to be furnished Duly supported by figures in Balance Sheet / Profit and Loss Account for 5(five) years and certified by the Chartered Accountant, as submitted by the applicant to the Income-Tax Department (Copies to be attached).

Sl. No	Details	(1) 2016-15	(2) 2015-14	(3) 2014-13	(4) 2013-12	(5) 2012-11
i)	Gross annual turnover in construction works.					
ii)	Profit / Loss					
iii)	Financial Position :					
	a) Cash					
	b) Current assets					
	c) Current liabilities					
	d) Working Capital (b-c)					
	e) Current Ratio :					
	Current Assets / Current Liabilities (b/c)					
	f) Acid Test Ratio Quick Assets / Current Liabilities (a/c)					

Financial Years

II. Certificate of Financial Soundness from Bankers of Applicant. (Form – B)

III. Financial arrangements for carrying out the proposed works.
Note: Attach additional sheets, if necessary

(Signature of Applicant)

FORM 'B'

FORM OF BANKERS' CERTIFICATE FROM A SCHEDULED BANK

The is to certify that to the best of our knowledge and information that M/s./ Shri……..……having marginally noted address, a customer of our bank are/ is respectable and can be treated as good for any engagement upto a limit of Rs……..(Rupees……..)

This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

Date:

(Signature)

For the Bank

NOTE (1) Bankers certificates should be on letter head of the Bank, in sealed cover addressed to tendering authority.

(2) In case of partnership firm, certificate should include names of all partners as recorded with the Bank.

FORM 'C'

Details of all Works of Similar nature completed during the Last Seven Years (December 2016)
(Attach completion certificate for each of works)

Sl. No.	Name of work / Project and location	Owner or Sponsoring organization	Cost of work (in crores)	Upto date Cost of the work enhanced @ 7% per annum	Date of commence -ment as per contract	Stipulated date of completion	Actual date of completion	Litigation Arbitration pending / in progress with details (indicating gross amount claimed and awarded by the contractor)	Name and Address Telephone of officer to whom reference may be made.	Remarks
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.

Date:

(Signature of Applicant)

FORM 'D'

Details of All Works / Projects under Execution or Awarded

Sl. No.	Name of work Projects and Location	Owner or sponsoring organisation	Cost of work (In crores)	Date of commencement as per contract	Stipulated date of completion	Up-date % progress of work	%age of remaining work	Value of remaining work	Slow progress if any, and reasons thereof	Name and Address / Telephone No. of the officer to whom reference may be made.	Remarks (indicate whether any show cause notice issued or arbitration initiated)
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.

Certified that the above list of work is complete and no work has been left out and that the information is correct to my knowledge and belief.

Date:

(Signature of Applicant)

FORM 'E'

Performance Report of Works Referred In Form 'C' & 'D'

(Furnish this information for each individual work from the employer for whom the work was executed)

1. Name of work / Project & Location
2. Nature / Description of Work:
3. Agreement No.
4. Estimated Cost
5. Tendered Cost
6. Actual value of work done:
7. Date of start:
8. Date of completion:
   a) Stipulated date of completion
   b) Actual date of completion
9. Amount of compensation levied for delayed Completion if any.
10. Performance report

iv)	Quality of work	Very good/ Good/ Fair/Poor
v)	Financial Soundness	Very good/ Good/ Fair/Poor
vi)	Technical Proficiency	Very good/ Good/ Fair/Poor
iv)	Resourcefulness	Very good/ Good/ Fair/Poor
vii)	General behavior	Very good/ Good/ Fair/Poor

Chief Engineer-in-charge or Equivalent

(Seal of the organisation)

Date:

FORM 'F'

Structure of the Organization

1.	Name and address of the bidder	
2.	Telephone No. / Fax No. / email address	
3.	Legal status of bidder (Attach copies of original document defining the legal status). The applicant is : a) An individual b) A proprietary Firm c) A Firm in partnership d) A limited company or corporation.	
4.	Particulars of registration with various Govt. bodies (Attach attested photocopies) a) Registration Number b) Organisation / Place of registration. c) Date of validity	
5.	Name and title of Directors and officers with designation to be concerned with this work.	
6.	Designation of individuals authorised to act for the organization.	
7.	Was the bidder ever required to suspend construction for a period of more than six months continuously after he commenced the construction? If so, give the name of the project and reasons of suspension of work.	
8.	Has the bidder or any constituent partners (s) in case of partnership firm, ever abandoned the awarded work before its completion? If so, give name of the project and reasons for abandonment.	
9.	As the bidder, or any constituent partner in case of partnership firm, ever been debarred/ black listed for tendering in any organisation at any time? If so, give details.	
10.	Has the bidder, or any constituent partner in case of partnership firm, ever been convicted by the court of law? If so, give details.	
11.	In which field of Electrical Engineering construction the bidder has specialization and interest?	
10.	Any other information considered necessary but not included above.	

(Signature of Applicant)

FORM 'G'

Details of Technical and Administrative Personnel, in the organization and to be employed for the work

Sl. No.	Designation	Total Number	Number available for this work	Name	Qualification	Professional experience and details of works carried out	In what capacity these would be involved in this work	Remarks
1	2	3	4	5	6	7	8	9

Date:

(Signature of Applicant)

FORM – 'H'

Details of Construction Plant & Equipment possessed by the Agency and likely to be used in carrying out the Work

Sl. No.	Name of equipment	Nos.	Nos. likely to be used in the Project	Capacity and type	Age	Condition	Ownership Status			Current location	Remarks
							Presently Owned	Leased	To be purchased		
1	2	3	4	5	6	7	8	9	10	11	12

Date:

(Signature of Applicant)

FORM 'I'

WILLINGNESS LETTER

To,
The project -in-charge,
Indian Institute of Technology, Indore
Simrol Campus,
Khandwa Road, Indore.
453552

SUB: Electrification work of HUB Building for Simrol campus, IIT Indore.

Sir,

Having examined the details given in Notice Inviting Tender published in the newspapers and bid documents for the above work, we hereby submit the following:

1. I / We registered contractor(s) of organization _____ in category _____ Class _____ vide letter No. _____ dated _____.

2. I / We express our willingness to perform the contract of electrical works in association with_____.

3. I / We submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following work :

   (a) Name of work :

   (b) Certificate from :

Enclosures:nos.

Date of submission:Signature of Applicant

SECTION – IV

- **Technical Specification**
- **Make List**

TECHNICAL SPECIFICATION

1. INTRODUCTION :

This technical specification is intended to enable the tenderer to submit a detailed offer for installation, erection, commissioning and testing arranging Owner/Consultant's inspection of installation of the electrical equipment to be installed at new HUB Building as indicated in the scope list and annexure of this document. This specification and annexure are the part of the tender document. These documents are complementary to each other and anything called for in one and not by the other shall be considered as binding, as if called for by one and all.

1.1 POWER SYSTEM & SITE CLIMATIC CONDITIONS :

Sr. No.	Particular	Description
1.0	Electrical Power System :	
1.1	Voltage	415 +10%, -15%
1.2	Neutral Earthing	Solid Earthing
1.3	Phase	TPN
1.4	Frequency	50 Hz
1.5	Short Circuit Capacity	~50KA, 1 Sec.
1.6	Auxiliary Voltage	415V, TPN, 230V SPN, 50 Hz
1.7	Control Voltage	110V DC; 110V AC, 1 Ph.
2.0	Site Climatic conditions for Design	
2.1	Max. ambient air temperature	50°C
2.2	Max. relative humidity	95%
2.3	Seismic zone	III

1.2 ABBREVIATIONS :

The abbreviations of the various parties being involved in the technical specification are defined as follows:

- **IIT INDORE**:CLIENT/ Purchaser
- **CONTRACTOR** :ERECTION AGENCY

1.3 CODES AND STANDARDS :

The following Indian Standard Specifications revised as on date will apply to the equipment and contract.

- Switchgears	IS 3072
- Earthing	IS 3043
- Electrical wiring installation	IS 732
- PVC wires	IS 694
- Domestic Switches	IS 3854
- Three pin plugs and socket outlet	IS 1293
- Switchgears Bus Bars	IS 375
- Distribution boards	IS 2675 & IS 2147 (For Enclosure)
- PVC/XLPE cables	IS 1554
- Ceiling fans	IS 374
- Industrial light fittings	IS 1771
- Fittings for rigid conduits	IS 2667
- tubular filament lamps	IS 2410
- Tungsten filament lamps	IS 415

All the work will comply with the latest applicable standards, regulations and safety codes of the locality where the installation is carried out. Nothing in this contract specification will be construed to relieve the CONTRACTOR of this responsibility.

The installation work must conform to the latest applicable codes of practices, electricity rules, fire insurance regulations and standards.
The contractor is responsible for observing all regulations, standards and rules which are of importance for the erection and safe operation of the facility. Other codes may apply with the prior approval of CLIENT. The provided equipment shall be equal or better according to the already listed standards.

The Client's General Specification/ instruction, issued from time to time shall also be followed.

2. CONCEALED POINT WIRING/CONDUITING :

The specifications described here refers to concealed conduit wiring required for light/power socket. Under the scope of point wiring, CONTRACTOR has to supply and fix from switchboard to all points, specified approved make of medium/heavy duty PVC conduit of sizes specified in bill of quantities and

accessories like bends, junction boxes, MS pull boxes of specified sizes with top MS covers, check-nuts etc. Complete conduit shall concealed in walls, ceiling etc. by chiseling i.e. ziri cutting with mechanical cutter, installation before slab casting. All accessories and joints shall be fixed by threaded method and in no circumstances pin type accessories to be used. The capacity of conduit shall be as per IS732/1963 revised up to date. The conduits pipes in chase shall be installed by means of GI saddles fixed maximum at 400 mm distance. All conduit in switchboard/power boxes should be properly connected. After installation of conduits, steel wires of appropriate sizes shall be installed to enable pulling of wires after completion of entire conduiting. The conduiting method/specification are applicable for point, fan, exhaust fan, bell point, two way point, group control point, power socket wiring as specified in bill of quantities.

2.1 CONDUITING:

Supply and Fixing of specified diameter (as mentioned in BOQ) medium/heavy duty, HMS, FRLS PVC conduit approved make with accessories like bend, junction box, MS pull boxes with covers, adapters, check-nuts etc.

The CONTRACTOR will install conduits and pipes as specified and as shown in drawings and according to the IS standard. Conduit fittings will be of the same material as conduits.

Each conduit run will be marked with its designation as indicated on the drawings. Identification will be by means of painting so located that each run of conduit is readily identified at each end. Where conduits terminate at flush mounted boxes, cabinets or other enclosures, the designations will also be painted on the inside of the enclosure adjacent to the conduits.

Exposed conduit will be adequately supported by racks, clamps, straps or by other approved means. Conduit supports will be erected square and true to line and grade with an standard spacing.

The fabrication and installation of supports and the clamping or fastening of conduits to supports will be included in the scope of work by the CONTRACTOR. Drilled and tapped holes for screw fastening for conduits on galvanized or painted steel will be touched up with red lead and same finishing paint before making up the connections.

The clamps required for laying of Conduits & Pipes installation shall be in scope CONTRACTOR**.**

Conduit will be entered into terminal boxes at locations as shown on the drawings, or unless otherwise directed by the Engineer. In general, all equipment enclosures, cabinets and housings requiring conduit or cable entry will be provided with terminal boxes designed for terminating and sealing the ends of paper insulated cable with compound or will have conduit terminating above level of emergence from floor concrete, with a wiped joint required between lead sheath and wiping sleeve on terminal box.

Where and if thin wall conduit is specifically permitted, conduit system will be made up in a neat manner, using compression type fittings, which do not require threading of the tubing. Fittings will be made up with full thread engagement between nuts and expansion sleeves and where thin wall conduits enter boxes, woulder of fitting will bear tightly against box, with locknut inside drawn up tightly.

Boxes will be installed so that they are level, plumb and properly aligned and present a pleasing appearance. The CONTRACTOR will perform all drilling, cutting, welding, shimming and bolting required for annexure to supports. Holes in steel will be touched up with Polyamine cured Epoxy paint as primer, welds will be wire brushed or otherwise cleaned, and welds to galvanized steel will be touched up with galvanized weld rod applied in accordance with the manufacturer's instructions.

Other un-galvanized areas will be primed with Polyamine cured Epoxy paint as primer. Where indicated by drawings, boxes will be mounted on masonry wall by means of anchor fasteners to be set by the CONTRACTOR for this purpose or will be mounted on angle, plate or other structural supports fixed to floor, wall, ceiling or equipment foundations. Where it is necessary to remove contents of boxes in order to install housings properly, or where housings are delivered separately from their intended contents, contents will be restored to their housings before the installation is considered complete. Terminal blocks will be mounted in boxes as required. The removable covers for boxes will be gasketted. All fittings on conduit systems having threaded connections will be made tight, with full thread engagement and with a minimum of wrench work in order to avoid wrench cuts. Joints will provide structural rigidity and low electrical resistance to ground across the joints in metallic conduit runs. Metallic conduit runs into metal boxes without threaded hubs will have two (2) locknuts and a bushing for connection unless otherwise shown on the drawings. All open conduit ends will have bell mouths with water-proof/fire-proof sealing, unless other terminations are required. Threaded joints will be made up by turning, if possible, from a point where a bend in the conduit occurs, or by using the offset in the conduit. All threads in steel conduit will be cleaned and well painted with zinc rich paint or approved equal. Wrench marks damaging galvanizing or similar protective coating on steel conduit not to be embedded in concrete will be

smoothened and cleaned, after which they will be touched up as specified by the Engineer. Slip joints other than approved expansion fittings will not be used. All conduit terminations will be located as shown on the drawings, where dimensioned. Accuracy of location will be within 6mm of the drawing dimensions except where greater accuracy may be required to avoid interference, to allow proper spacing and clearance for fitting or to permit proper insertion into terminating device.

A reasonable number of long, radius bends and standard conduit elbows 40 mm and over in normal conduit diameter may be furnished for use in permissible locations in the installation. All other bends in metallic conduits will be field bent. Long radius bends may be used in steel conduit runs to be embedded in concrete and standard radius bends may be used for turning out of thin Steels. Long radius bends and standard elbows under conditions requiring the same, may also be used in fabricating long runs of exposed steel conduit. Bends in embedded steel conduit runs and all bends in exposed runs where two or more conduits run parallel will be field bent to suitable radius to produce a neat appearance. All field-bends required in conduit runs will have uniform long radius sweeps bent on a suitable power bender or with other approved bending tools. The radius of any conduit bend, measured from the center of bend to the nearest external surface of the conduit will be not less than 12 times the nominal diameter of conduit. Where a shorter radius becomes necessary, it may be reduced upon approval of the Engineer.

Bends will be free from cracks, crimps or other damage to the pipe or its coating, and will not have the pipe section unduly flattened. Bends having a minimum inside diameter ten (10) percent less than the true diameter of the conduit or a cross sectional area five (5) percent less than the true cross sectional area will be rejected.

When the CONTRACTOR is required to install conduits embedded in foundation or structural concrete they will be run as directly as possible among the generally indicated route between two points with a minimum length and with a minimum of crossing, bending and cutting but without creating interferences with other installations.

For underground runs, depths required for major runs of conduits and ducts will be determined by uniform pitch shown by drawings towards given elevations of ends of conduits and ducts and hand holes. Where no such elevations are given for individual conduits, either in banks or run singly, the standards regarding depth established for these conduits and ducts for which elevations are shown will be maintained.

Embedded conduit running parallel to a masonry surface will possible, have a cover of at least 50mm. Conduit will be firmly fixed in place by being wired to reinforcing steel

or by other approved means to avoid being disturbed during placement of concrete. Where conduit terminates at or leaves the masonry, it will be carefully and firmly positioned by means of a suitable template. Where conduits change from embedded construction to exposed construction, all conduits in the same layer of the exposed runs will clear structural surfaces by the same amount, regardless of size, and the embedded portions will be installed so that such clearance will be provided without bending the exposed portions.

Where embedded conduits leave masonry, whether for permanent termination or for temporary termination for subsequent continuation, they will have a minimum threaded projection of 50 mm beyond the ultimate finished surface of masonry, unless otherwise indicated on the drawing. The CONTRACTOR will be responsible for determining the position of such finished surfaces, recognizing the fact that finished courses, curbs etc. may be incorporated in the structural designs, and will be placed subsequent to the masonry work in progress or completed at the time conduits to be embedded are placed. This requirement for projection beyond ultimate finished surfaces of masonry will not apply in special cases such as where a bend emerging from the concrete would be incomplete or where the drawings or scope of the work clearly require that the exposed portion of the conduit is to be carried to a particular point.

Conduits extending out of floors, walls, ceilings etc and which are exposed to possible damage will be boxed in or otherwise protected after installation.

In installing asbestos pipe or other fiber conduit, no cracked pieces will be used and sections racked or broken during or after placement will be replaced. As specified above, ends of all conduits will be clean. Sealing compound or asbestos cement will be used on all joints whether or not the conduit is encased in concrete. The sealing compound or fiber cement will be applied in accordance with the manufacturer's recommendations.

The CONTRACTOR will be responsible for bending of conduits/pipes, in which cables have been installed, to main earthing grid. Entire system of conduit after installation will be tested for mechanical and electrical continuity throughout and permanently connected to earth by clamps efficiently fastened to the conduits. Gas or other pipes will not be used as earth medium. The junction boxes to be used should be 62 mm deep for wall.

2.2 WIRING:

The point wiring shall be carried out by supply and laying 1100V graded PVC insulated copper wires of specified sizes (preferably 2x1.5 mm2 copper). These two wires are to be used for phase and neutral. An earth wire of 1100 V insulation grade of 1.5 sq. mm copper shall be used for all points. Complete wiring shall be strictly done as per specifications and drawing details. Point shall be individually wired with phase, neutral (unless specified otherwise) earthwires and all point neutrals shall be looped at switchboards (on connector in switchboard). All earth wires shall be fixed on switchboard box and connected with main earthwire brought along with circuit wire. In no circumstances neutral should be loosely connected by twisted joint. Entire precautions should be taken while drawing wires inside conduit to ensure safe installation. Regular pull boxes of MS are to be provided maximum at 4.5 Mtr. length for ease in maintenance. The maximum number of wires per conduit shall be as per specifications given herein and no attempt shall be made to accommodate more wires. Under the scope of point wiring all the work shall be done as per Delhi Schedule of Rates.

The scope of wiring shall be from distribution board to each switchboard, power socket and complete wiring shall be done with 1100V grade PVC insulated flexible copper wires. Independent wires with colour code shall be used for phase, neutral and earth. Wire sizes shall be used as per bill of quantities and drawings. Mains wiring also includes termination of wires at DB and power outlet including providing ferrules at both ends for identification. Looping of power sockets shall be done as per CPWD norms. Earthing wires shall be dedicated type and is to be used for each power point/switch board/ DB. For a three phase circuit two earth wires of specified sizes are to be used from meter panel to power points. The earth wire is to be terminated at earthing link of panel and power outlet box.

2.3 CABLE LAYING IN UNDERGROUND TRENCH

The cable trench in ground has to be prepared by excavating soft murrum/black soil/hard murrum as per details given in trench drawing with specifically maintaining clear dimensions of trench i.e. (width/depth/length). The rates for excavation shall be quoted after visiting site. After complete excavation of length of trench, the sand bed of 50 to 100 mm thickness has to be created in bottom of trench. Fine river sand has to be used for this purpose and it is to be ensured that this sand does not contain stone/gravel etc. The sand bed has to be even and a pre inspection of this shall be arranged with consultant/Engineer-in-charge. The cables are than to be laid in these trenches. Cable drums has to be shifted

from stores to site of laying by the Contractor and hydraulic jack shall be arranged for lifting of drums. Sufficient manpower shall be arranged for uncoiling/laying of cables in order to avoid damage to cable. The work includes supply of cables. Length of cable piece has to be properly measured and cut from the drum. The cables are to be laid in the trenches maintaining minimum spacing of 100 mm (or as specified in the drawing). After laying of all cables in trenches, cable identification tags are to be installed at every Mtr. distance. These tags are of Aluminium flat (minimum size 25 x 3 mm) and shall bear punch mark of cable number. The cable number shall match to that of given in cable schedule and in case of any alterations prior to permission of Consultant has to be obtained. After this another sand bed of 100 mm has to be prepared over cable. The bricks are then to be kept on the edges of cable over sand as per drawing and details. The backfilling of soil and proper leveling, length compacting shall be done. After completion of complete work, the route markers of cable trench has to be installed along the trench. The size of route marker shall be minimum dia 100 mm x 3 mm bolted on MS angle of size 40mmx40mmx5 mm. These markers are to be grouted in ground approximately and every turning has to be provided with separate route marker. For every road crossing, entry in building etc. cable sleeves RCC/GI in specified sizes are to be provided as per drawing and details. Complete work shall be done to ensure reliability of system. The work is including supply of cables.

2.4 CABLE LAYING ON TRAYS/WALLS

The cable trays are to be fabricated out of MS angle of given sizes. The trays has to be fabricated in two parts i.e. cable trays and its supports. Complete fabrication work of tray/support has to be done by straightening of angles, fabricating specified sizes, removal of sharp edge and installation of trays on supports. The tray has to be installed in such a way that same level is maintained on one runner (unless specified otherwise). The `T' section, bend has to be long radius type and shall be minimum 16 x outside dia of biggest size cable. The supports at such sections has to be provided in addition to that shown in the drawing. Complete cable trays are to be painted with one coat of red oxide/two coats of black synthetic enamel paint. After completion of above work cable laying has to be started from LT panels to machines/power outlets. The premeasurement of cable length has to be carried out and only after ensuring correct required length, cable has to be cut. The cables are to be laid on trays with minimum spacing of 75 mm (or as specified in the drawing). After laying of all cables, `AL' tags are to be installed along with `AL' clamps (made from `AL' strip of minimum 25mm x 3mm). The spacing between such clamps shall be maximum at 450 mm and that between tag is same as specified in (1).For

installation of cables in walls, MS/GI spacers shall be used. Spacers shall be MS/GI flat of 25mm x3 mm upto 16 mm2 cable and 40mm x 6mm above 16 mm2 cables. The spacing shall be maximum 200 mm and it shall be fixed with GI machine screws. Complete work has to be executed ensuring safe installation.

2.5 CABLE END TERMINATION

The cable end termination of all cables has to be done by a skilled cable jointer (to be arranged by Contractor) using proper size cable glands, lugs, ferrules of approved make. All such required material shall be supplied by Contractor. The cable glands shall be installed by punching appropriate size hole on gland plate. No extra hole shall be punched unless specified otherwise. The gland plate has to be refitted properly to ensure verminproofners of panels. The lugs shall be of Copper and shall be crimped using crimping tool compression type. Above 50 mm2, hydraulic crimping tools are to be arranged by the Contractor. Before crimping lugs contact enhancement paste has to be provided of approved make. The termination is then to be carried out ensuring tightness/proper contact at the point of termination.

TESTING OF CABLES

Prior to burying of cable, following tests shall be carried out:
Insulation test between phase and phase and earth for each length of cable before and after jointing.
On completion of cable laying work, the following test shall be conducted in the presence of the Architect / Consultant

a. Insulation Resistance Test (section and overall)
b. Continuity Resistance Test.
c. Sheathing Continuity Test.
d. Earth test.

The contractor shall provide necessary instruments, equipments and labour for conducting the above test and shall bear all expenses in connection with such test. All tests shall be carried out in the presence of the, Architect / Consultant.

2.6 FANS AND FIXTURES

Fans and fixtures shall be supplied by the contractor rates to include storage and handling. Connections to the Fans, Fixtures and Exhaust Fans shall be with 3x1.5 sq mm copper conductor PVC insulated round flexible cord. Connection charges shall exclude all sundry material required for erection like

connector strip, PVC tape, MS and wooden screws of GI, round blocks, wooden plates etc. The installation charges for Fans, Exhaust Fans shall include installation and connection of regulator, installation of exhaust fans shall include grouting of frame or tightening of frame with Anchor bolts as per site condition i.e repairing the hole with plaster 1:3 and painting to match as original work. Wall fans shall be fixed on 15 mm thick teak wood plate of 300 mm x 180 mm size and shall be grouted/fixed on wall by 6 nos. Anchor bolts of 1/2" dia of coach screw as per site conditions. All work shall be carried out neatly and as per the direction and to the satisfaction of Consultant. All fans and fixtures shall be connected with earthwire.

2.7 EARTHING

Under the scope of earthing work earthing of street lighting, Control and distribution boards, individual equipment, machines etc. is covered The earthing is segregated in different items and is to be done as per following details. The work includes supply of all materials required for earthing.

CHEMICAL EARTHING

The earthing electrode has to be installed by excavation of soil in size 900mm x 900mm x 3000 mm (Depth). On completion excavation, earthing electrode as per specification has to be installed. The electrode is to be then covered with compound mixture, black soil as per drawing and specifications. After back-filling, the PCC in 1:2:4 is to be applied in an area of 300mmx300mm and brick masonry chamber(thickness of chamber wall 200 mm) has The chamber cover and frame of 300mmx300mm of CI shall be supplied and grouted in brick masonry. The chamber cover shall have lifting hook and shall have space in frame for proper placement. The test link between earthing pit clamps and running earthing strip is to be provided for testing . After completion of work, resistance of earthpit has to be measured 4 pin method and results shall be recorded /handed over to Client /consultant in 1 sets.

EARTHING STRIP

The scope of work includes supply of hot dipped galvanised iron strips/wire as per details and drawings. The GI Strip supplied for purpose shall be continuous (minimum single length acceptable in 10 mtr.) The strip has to be straightened without damaging galvanising. The strip has to be welded by overlapping and three side continuous welding joint. These joint shall then be cleaned and jute covering has to be provided (wherever strip is buried in ground). After this black bituminous anti corrosive paint has to be applied on all joints.

Same process has to be adapted for all tappings also in case if earth wire is required to be connected on strip with the help of bolt, GI bolts, nuts are to be used along with covering and painting. The earthing strip wherever indicated in drawing, has to be supplied in ground at a depth specified in dwg. The earthing strip shall be covered with black soil and in no case sand has to be used around strip.

2.8 TELEPHONE SYSTEM

The wires and cable used for telephone system shall be as mentioned in list of approved make and PVC insulated and sheathed 0.5sqmm tinned copper conductor wires of various pairs should be laid in previously laid metal conduits. The telephone wiring shall be carried out in the under mentioned manner confirming to the particular specifications

a. In Concealed system including providing and laying conduits, bends, junctions boxes, pull boxes, hardware etc.

b. The installation generally will be carried out in conformity with the norms and rules laid down by the P&T depat. of govt. of India and IS specifications. The rate shall be on the basis of supply and fixing of dummy conduits and supply, installation, testing and commissioning of telephone cables as described above on per meter basis and of tag blocks and distribution frames on per unit basis.

Capacity Of Telephone Wires/Cables

Size of Cable	Conduit Size
Up to 5 pair	20 mm
Above 5 pair up to 10 pair	25mm
Above 10 pair up to 20 pair	32 mm
6 Nos. 2 pair	20 mm
8 Nos. 2 pair cable	25 mm
10 Nos. 2 pair cable	32 mm

Note : Minimum size of conduits shall be 19/20mm.

3. STATUTORY APPROVALS

CONTRACTOR shall obtain approval from statutory authorities ‘MPPKVVCL’ (electrical inspection clearance for LT and other systems as required by domestic / local / state rules and regulations) and concerned agencies for the installation and shall carry out any changes in the installation work called for by the said authorities (as required) at his own costs. CONTRACTOR shall also provide required assistance to CLIENT to taking statutory clearance from concerned government authorities.

Maximum Capacity of PVC Conduits for simultaneous Drawing-in of PVC Insulated Copper Conductor Cables 1.1 KV Grade (Flexible wires)

CONTRACTOR shall obtain approval from statutory authorities (electrical inspection clearance for LT and other systems as required by domestic / local / state rules and regulations) and concerned agencies for the installation and shall carry out any changes in the installation work called for by the said authorities (as required) at his own costs. CONTRACTOR shall also provide required assistance to CLIENT to taking statutory clearance from concerned government authorities.

After the completion of the installation services (or of partial services) application for formal acceptance must be submitted by the CONTRACTOR. An acceptance of the service rendered must be carried out in the presence of CLIENT and the CONTRACTOR.

CONTRACTOR and CLIENT shall mutually agree about the acceptance procedure and handling according to the specification, the performed work and the CLIENT contract specification close to the end of the services which are described in this erection specification.

An acceptance report about the acceptance performed must be prepared and signed by the CONTRACTOR and CLIENT.

Wire size	Maximum Number of Wires in single Conduit		
	20 mm	25 mm	32 mm
Nominal Area mm2			
1.5 sqmm	5	10	14
2.5 sqmm	5	8	12
4 sqmm	3	7	10
6 sqmm	2	5	8
10 sqmm	-	4	7
Note : No conduit less than 20 mm in dia shall be used.			

4. INSTRUCTIONS :

STORAGE :

In close vicinity of the site, equipment and material which are brought by the contractor can be stored at site for the completion by himself.

At this location the contractor shall build a site office for handling the administrational issues for the intermediate storage. Intermediate stores as per requirements for safe storage of all equipment/material at stores and taking them to the site, till such time these are erected, tested and commissioned and handed over to the CLIENT.

Round the clock security arrangement of intermediate and erection site safe custody of the equipment shall be responsibility of the CONTRACTOR. Any damaged/theft to the equipment during this period shall be made good by means of repair / replacement. It is CONTRACTOR's responsibility of receiving, unloading, transportation of the material from the CLIENT / main storage area from there up to the actual place of the erection and deposit excess material (as required) to the CLIENT / main storage - same handling applies for unused materials after final reconciliation or completion of the job.

Opening of carats and packing cases thorough cleaning and checking of completeness of the equipment etc. in relation to the equipment manufacturer's drawings, packing lists etc. and inspect the equipment etc. for any visible damage or external defect. Damages or missing items if any shall be reported to CLIENT further course of actions and/or repair / re-order of damaged and short supply items.

OFFICE FACILITIES :

Provision and set-up of sufficient site office space shall fall under the responsibility of the CONTRACTOR and shall be borne by him. The installation sites for the site management office, social amenities/ containers, meeting rooms and intermediate storage areas for material (if required) shall be determined after consulting CLIENT.

TOOLS :

The CONTRACTOR shall provide all installation tools, tackles, auxiliary equipment, lifting and transport equipment, site power distribution systems and consumables for the installation according to but not limited to DIN 52900.

The equipment being provided shall be in excellent conditions, well maintained and fully functional. The tools shall be available in a sufficient number and must suit the requirements of the installation work.

CONTRACTOR shall also check and assure that his sub-suppliers are also equipped with the proper tools and equipment. CLIENT is not tolerating any "handmade" tools. CONTRACTOR must replace damaged or not usable tools immediately. Following is a tentative list of tools which shall be in minimum (but not limited to) available in the proper amounts and shapes on site Electrical items.

All material to be supplied by the Contractor must be of approved quality and make and must be got/approved by Engineer-in-charge/Architect before use.

The installation shall have to be approved by Electrical Inspector/MPPKVVCL and/or any other local authorities, if required and such approval shall have to be arranged by Contractor. Any alterations, additions suggested by them shall have to be incorporated by the Contractor at his cost.

The Contractor shall follow all the rules and regulations like factory act, workmen compensation act and shall be responsible for any injury or accident to persons working at site.

After getting permission of charging from Electrical Inspector's office it is duty of Contractor to follow-up for installing energy meter and getting line charged from MPEB as early as possible. All follow-up expenses shall have to include in offer.

The Contractor shall keep at site of work one engineer having diploma in electrical engineering for receiving instruction and shall have to give satisfactory progress of work .The contractor will have to obtain prior approval of EIC by submitting the credentials of the electrical engineer he propose to appoint on site of work .Even during execution if EIC/Architect feels that the said engineer appointed by contractor has failed to perform his duties satisfactorily ,they can instruct the contractor to appoint another engineer and contractor will have to comply it immediately.

Erection agency will provide technicians and semi-skilled workers during testing and commissioning for the erected equipment till successful commissioning of entire plant or 36 months from the date contract whichever is earlier free of cost.

Any extra items that may crop during the progress of the work shall have to be carried out by Contractor, if ordered so and shall be paid for the same at the rates to be worked out with mutual agreement. Payment of extra items of work will be made on the basis of cost of material and labour + 15%. The latter figure would include all costs towards supply of all tools, plant hire charges, scaffolding charges, overhead expenses, Contractor's profit margin etc.

In case of any dispute with setting of claims for extra items, the decision of Client will be considered final and binding of the Contractor.

If any part or whole of the work or any item is not executed to the entire satisfaction of the Engineer-in- charge/Architect. The Contractor shall have to demolish and do the same work again with out any extra cost if so ordered by the Engineer-in-charge/Architect.

Whatever material/equipments supplied by the Contractor, he has to supply 4 sets of test certificates from the manufacturers ,like electrical control panel, sub distribution boards, MCB, MCCB, wires, cables and other item etc.

On the completion of the work the Contractor shall supply free of charges, completion plan in triplicate, in blue prints and also in original drawing on tracing cloth. Insulation and earth test report of the Internal and External electrification installation shall be supplied in 3 copies. These shall be handed over to the Consultant in good condition by the Contractor before the finalization of his final bill.

The quantities as shown in the Tender are approximate and may change or delete according to site situation/conditions. However, the payment will be made on the actual supply and work carried out at site and duly certified by the Consultant.

All materials brought at site shall be as approved by Consultant and if desired so contractor shall arrange for testing of materials at laboratory (ERDA ,Baroda)for any electrical parameter checking. All such expenses shall be borne by contractor and are included in quoted rates.

General repairs should be done before completion of work.

Guarantee period for all work/supply and complete installation (without tube light and lamp) will be of one year (12 months) from date of completion of work as per manufacturer guarantee.

5. TESTING AND COMMISSIONING

Before the lighting/power installation is made alive the Contractor shall carry out tests enumerated below in presence of Engineer-in-charge or his authorized representative. All testing equipments necessary to carry out the tests shall be arranged by Contractor and the tests results recorded on approved format. Nothing extra shall be payable for testing.

- Measure insulation resistance of each circuit without lamps being in place and it should not be less than 5 mega ohms to earth.
- Before energizing, measure insulation resistance of the cable from phase to phase and that from phase to ground, Insulation resistance of the busbars at the lighting panel from phase to phase and from phase to ground shall be measured before energizing the panel and should comply latest IS.
- Current and voltage of all phase shall be measured at the lighting panel busbars with all circuits on with fixture and also in all switchboard.
- Check the earth continuity for all sockets outlets. A fixed relative position of the phase and neutral connection inside the socket shall be established for sockets.
- The earth electrodes shall be tested for earth resistance by means of standard earth tester. The resistance between the earthing system and the general mass of earth shall not be greater than 1 ohm.

- While crossing the expansion joints in building conduits shall be provided with flexible pipe shall not be more than 250 mm, at both the ends of conduit proper flexible couplings shall be provided and earth wire shall be properly connected to earthing terminal of coupling.
- Contractor should quote after site visit only. In case for cable trench, street light pole pit, earthing pit etc. or any place where Contractor has to dig the earth in hard strata or rock he has to do so at quoted rates only for otem. No blasting shall be allowed for such digging.
- For earthing of street light tubular pole earth spirit shall be used. Out of 6 SWG GI wire as per standard specification.

6. TECHNICAL SPECIFICATION FOR ELECTRICAL PANEL

Scope of work covers detailed Engineering, fabrication, assembly of switchgears, testing of distribution boards at factory, delivery at site, testing of LT distribution boards for 500V 50Hz operation. Complete panel shall be fabricated by approved vendor. CPRI certificate shall be made available.

Installation of LV Power Distribution Panels and control panels of various styles and purposes :

The types of panels consist of the following (but limited to):

a)Power Distribution Panels (PDBs).
b)Lighting Distribution Panels (LDBs).
c)Main Power Distribution Panels (MDBs)
d)Local Isolators for cranes and plant machineries.
e)Maintenance Switch Boxes (MSBs).
f)Panels for the UPS and battery sets.

The installation and location is as per arrangement drawings. The panels shall be adjusted and aligned at the respective position as required. The panels may be stand-alone units or are split in shipping sections. Any loose items being supplied with shipping sections are to be mounted. For detail, please refer remaining cabling and installation work in relevant chapters of this specification. Steel members required for fabrication of steel structure for panel installation shall be in scope electrical installation CONTRACTOR.

The fabrication details of distribution boards shall be worked out on the basis of type (Floor mounted/wall mounted), area of utilization (on trench/on floor etc.) For free standing distribution board a robust base channel of not less than 10 gauge with section of 100x50 (mm) shall be prepared. Complete panel shall be fabricated as per following details:

Door, mounting plates of switchgears, vertical compartment sheets shall be of min. 14 gauge
Compartment partition horizontal plates shall be of min. 16 gauge
Gland plates (with minimum 4 nos. of fixing bolts) shall be of min. 10 gauge

The panel shall be provided with top as well as bottom gland plate unless specified otherwise. One gland plate shall be made suitable for maximum 4 nos. of cable, if no. of feeders in particular alley has more cables, then multiple cable glands has to be provided. The panel should be fabricated with separate provisions for busbar chamber, cable alleys, instrumentation & metering units. Facility of front & back maintenance doors shall be provided for every maintenance. Cable alley shall be provided with slotted angel supports of suitable size for cable supports at every 300 mm vertical hinges on one side. The front doors shall have panels door locks openable by key & back doors shall be with bolt type arrangement having locking washers. All doors shall have rubber gaskets along the periphery to ensure dust proof/vermin proof conditions. Suitable stiffeners if required due to larger size of doors are to be provided while fabricating doors.

The panel cubical shall be fabricated strictly as per details given in drawing. The panel shall be front operated front maintenance type, unless specified otherwise. The meters relays, indication lamps shall be provided on front doors with proper cutouts. Arrangement for earthing terminals extended flats of 'AL' on both sides to connect 50x5 GI earth strips shall be provided on panel.

Three phase boards shall have phase barriers and a wire channel on three sides. All DB’s shall be internally prewired using copper insulated PVC wires brought to a terminal strip of appropriate rating for outgoing feeders.

6.1 BUSBARS

High conductivity electrolytic grade `Cu'/`Al' alloy of size as per details/specifications confirming to E 91 E IS-5082 shall be used to construct busbar. The busbar size shall remain same throughout the length of panel up to incomer & only branch sizes are to be different as per requirement & arrangement of outgoing feeders. Maximum current density permissible in aluminum busbar shall be 0.8A/sq. mm. The busbar shall be provided with heat shrinkable sleeves with appropriate colour code for phase & neutral. The material sleeves shall be non inflammable & self extinguishing type. The busbars shall be adequately supported by SMC-DMC fingers/Supporters, epoxy compound casted in desired no. & size to take care of thermal/mechanical stresses during normal & short circuit condition (50 KVA fault level).

6.2 HARDWARE/MISCELLANEOUS ITEMS

The hardware to be used in panels shall be zinc plated & all joints & connections shall be made with galvanized zinc passivated or cadmium plated high tensile strength steel bolts/nuts/spring washers etc. The make of hardware items shall be UNBREKO/GKW. All control wires shall be of 1.1KV grade flexible copper of FINOLEX/MILAX make with DOWELL/3D make copper pin type lugs. The control fuses of HRC 2A/4A of ENGLISH ELECTRIC make shall be provided with ferrules for identification of wires.PVC grey casing for wires shall be provided in cubicles. All wire shall be suitably tied with PVC button straps. Appropriate rubber bushes, clamps are to be crossover of control wiring in cubicles etc.

6.3 POWDER COATING

After completion of fabrication work, complete fabricated structure shall be thoroughly cleaned to remove traces of grease, rust, scale and dust. The seven tank process for treatment of fabricated structure shall be used. After preparation of fabricated surfaces, the panel shall be powder coated with synthetic enamel paint up to 50 microns thickness. The finished panels shall be dried in storing ovens in dust free atmosphere to ensure fine quality finish. The paint shall be Berger Luxol Higloss, with Siemens gray color for inside outside.

6.4 INCOMING & OUTGOING TERMINATION ARRANGEMENT

All incoming & outgoing feeders are to have termination arrangement in separate cubicle. The incomer bus extension shall be provided from incomer SFU/ACB/MCCB up to incomer termination chamber. Also all outgoing feeders shall have busbars extension up to cable alleys. Sufficient space has to be provided for termination of cable/wires in cable alleys. The feeders below 40A can be provided with flexible cable & ELMEX connectors. All feeder outlet shall be provided with insulated barrier plates between two outgoings.

6.5 COMPONENTS

6.5.1 MOULDED CASE CIRCUIT BREAKERS (MCCB)

MCCBs shall satisfy the requirements of IS – 2516 and shall be current limiting type. MCCB shall confirm to the latest IS : 13947 – 1993 and IEC : 947 – 1989. MCCB shall provide type ‘C’ protection to the contactors as per IEC 158-IB. MCCBs shall be quick make, quick break, and preferably double break contact system, are extinguishing device, independent manual type with trip free feature with mechanical ON,OFF, and TRIP indications. A trip button shall be provided for tripping the breaker. All short circuit ratings shall be Ics values. MCCB shall be a compact high

strength, heat resistant, flame retardant, insulating moulded case with high withstand capability against thermal and mechanical stresses. All MCCBs shall be capable of defined variable overload adjustment. All MCCBs rated 200 Amps and above shall have adjustable Magnetic short circuit pick up.

6.5.2 MINIATURE CIRCUIT BREAKER (MCB)

Miniature circuit breakers shall be quick make and break type and conform to IS: 8828- 1996 / IEC : 898-1985. The housing of MCBs shall be heat resistant and having a high impact strength. The fault current of MCBs shall not be less than 10 KA, at 230 volts. The MCBs shall be flush mounted and shall be provided with trip free manual operating mechanism with mechanical 'ON' and 'OFF' indications .The circuit breaker dollies shall be of the trip free pattern to prevent closing the breaker on a faulty circuit. The MCB contacts shall be silver nickel and silver graphite alloy and tip coated with silver, Proper are chutes shall be provided to quench the are immediately. MCB's shall be provided with magnetic Thermal release for over current and short circuit protection. MCB shall be current limiting type (class-3) MCBs shall be classified (B,C, ref IS standard) as per their tripping characteristic curves. MCB shall have the minimum power use (watts) per pole as defined in IS/IEC.The over load or short circuit devices shall have a common trip bar independent to the external operating handle in the case of DP and TPN/4P Miniature Circuit Breakers. All the MCB's shall be tested and certified as per Indian Standards, Prior to installation.

RESIDUAL CURRENT CIRCUIT BREAKER (RCCB)

The Residual Current Circuit breaker (RCCB) are the safest device to detect and trip against electrical leakage currents, thus ensuring protection against electric shock caused by indirect contacts. These devices must be used in series with an MCB or fuse which protects them from the potentially damaging thermal and dynamic stresses of any over currents. They also act as the main disconnecting switches upstream of any derived MCBs (e.g. domestic consumer unit). RCCB shall be designed with surge current withstand capability to prevent nuisance tripping during thunderstorms. The sensitivity of RCCB shall not be less than 30mA . It shall have selective trip unit, mechanical indication for earth fault and electrical indication through auxiliaries. The RCCB shall confirm to IS-12640 (part-1) : 2008 and IEC - 61008-1 : 1996

CURRENT TRANSFORMER

Current transformers shall be cast resin type. The short time withstand rating of CT's shall be equal to that of the associated switchgear for one second. The

protection of CT's shall be 15VA, accuracy class 5P & an accuracy limit factor of 10 unless otherwise specified. The instrument CT's shall be of 10VA, accuracy class 1.0 & an instrument safety factor of 5CT's shall not be directly mounted on the buses. CT's on ACB feeders shall be mounted on fixed portion of compartment. CT's shall be terminated through terminals / disconnectable links which gives help during testing.
Separate CT's shall be provided for protection & metering.

INDICATING INSTRUMENTS

These shall be 144 mm2 for MEP & 96 mm2 for PDBS, flush mounting type with range as per corresponding feeder. Energy meters shall be suitable for measuring unbalanced loads & shall be provided with all out-going feeders of PCCS. 96 mm2 size CTR ammeter with ASS shall be provided for each out-going feeders. All voltmeter and indications shall be provided with VSS & control fuse.

INDICATING LAMPS

Indicating lamps shall be of 22.5 mm dia LED type & shall be Red, Yellow, & Green colours.

PUSH BUTTONS

Push button shall be momentary contact type rated to carry 10A, 240V AC with 2 NO+2 NC contacts for START/STOP of green & red colors & other suitable colors.

EARTHING

An earthing strip of 50 x 6 mm2 size for MEP & 25 x 6 mm2 for PDBS of `Al' shall be provided in each panel. All the CT terminals shall be earthed by two wires at different places & all metal castings of current carrying components shall be connected to earthing strips. All the hinged doors & PCCS & PDBS shall be earthed through flexible copper wire PVC insulated & crimped at both ends.

GENERAL

- Terminal blocks shall be of ELMEX make / similar of suitable capacity. Control & power terminals shall be segregated.
- Suitable HYLAM / BAKELITE / similar shroud be provided of minimum 3 mm size where bus links from busbar chamber & feeder chamber to cable chamber will be terminated.
- All the components shall be as per the relevant ISS & shall be of highest manufacturing quality & standard. The SFU shall be of AC23 duty only & ACB shall not have rupturing capacity less than 50 KA

- As given in the drawing in case of panels PCCS all cable chambers & bus chambers are in back of all out-going feeders.
- All the panels have sufficient quantity of bolted type lifting lugs welded at 50 x 6 angles along the depth of panels
- 6 One side of each shipping section should be pasted with gasket.

TESTS TO BE CONDUCTED ON DISTRIBUTION PANELS

The equipment shall be subject to standard routine test as per IS-2026 1977 on amended up to date.

- 2.5 KV high pot test with leakage current measurement.
- Meggar test.
- Load test by primary injection test kit at 70% capacity of the incomer.
- Secondary injection test for relays, meters & CT's.
- Temperature rise test FOR MEP.
- Functional test.

The above tests must be conducted in the manufacture premises in presence of Consultant's/Client's representative. The bidder who are not having those testing facility are not entitled to participate in the bid. Protective relays are to be tested/calibrated at installation prior to commissioning. Test certificates of the above tests shall be approved by Client/Consultant.

TYPE TEST CERTIFICATES

- The bidder shall produce following type tests certificate of CPRI (certificates shall be of recent 3 Years).
- Short circuit test at specified fault level.
- Temperature rise test.
- Degree of protection test-IP55/IP54
- H.V. test.

FIRE INSURANCE APPROVAL

The bidder shall have TAC approval from Tariff Advisory committee & copy of approval shall be enclosed with bid.

INSPECTION

The Consultant's/ Client's representative shall be free to inspect the equipment at several stages to be decided mutually. The equipment shall be dispatched only after the inspection & successful testing at manufacturers works.

DRAWINGS

Before starting the manufacture of the equipment, the successful bidder shall have to take approval from the Consultant / Client. Any manufacturing done prior to approval or any change in specification shall be rectified by supplier. Minimum Three sets of drawings sent for every approval & three sets shall be furnished after job completion.

OPERATION MANUALS

Three sets of operation manuals with the technical leaflets of the components used in the CPC & PBS are to be provided after completion of job.

PERFORMANCE GUARANTEE :

All the equipments shall be guaranteed for one year (12 months) from the date of commissioning or as per the CLIENT preference.

APPROVED MAKE OF MATERIALS
(For Internal Electrification)

S.NO.	DESCRIPTION	MAKE
1.	LT Panels	Siemens / Schneider / ABB
2.	Distribution boards	Legrand / Schneider/ Hager / Siemens/ABB
3.	Cable Lugs	Dowells / Comet/Jainson
4.	Cable glands	Dowell/Comet /Jaison
5.	Switches & sockets	Legrand / Crabtree / Schneider/ABB
6.	Telephone sockets	Legrand / Crabtree /
7.	Telephone Wire/Cable	Havells / Polycab / Finolex/ RR Kabel/Delton/Belden
8.	TV sockets	Legrand / Crabtree / MDS
9.	Coaxial Cable for T.V.	Finolex / RR Kable/Havells
10.	PVC insulated copper wires 1.1 kV grade.	KEI/KEC/Havells/ Finolex/RPG/Universal
11.	Al. Armour XLPE / PVC Cables	KEI/KEC/Havells/ Polycab/Finolex/RPG/Universal
12.	Ceiling fan and Exhaust fan	Crompton greaves/Usha/Orient/GE/Havells
13.	Lighting fixtures (indoor and street light)	Wipro/ Havells/ Bajaj / Crompton/Philips/GE/
14.	Garden / Decorative light fixture	K-lite / wipro/Havells/Philips
15.	PVC conduit and accessories.	BEC / Precision / AKG
16.	Bulb Holder , Ceiling Rose	Anchor / Leader/Western
17.	Room Switches, Sockets, Telephone Outlet boxes , TV outlet boxes)	Legrand (Mosaic)/ Crabtree (Athena) / Schneider (livia) / MK (equivalent)
18.	CTs (Resin Cast type)	AE/Reco / Gilbert & Maxwell / Kappa / Pragati
19.	Indicating lamps	AE / Rishab /L&T

20.	Push buttons	L&T / Siemens / Teknic
21.	Connectors	Elmex/Connect well/Salzer/wago
22.	Cable Lugs/Glands	Braco/Dowells/3d
23.	Multifunction Meters (Digital type)	HPL Socomec/ L&T /Dukati
26.	CAT6 LAN cable	D- Link/Finolex/Legrand
27	RJ 45 connector socket outlet	Legrand/D- Link/AMP
28	Industrial Socket	HPL Socomec/BCH
29	PVC Pipe	Kasta/Kissan/Supreme/Prince/ Precision / AKG / BEC
30	GI / MS pipe (Class B)	Prakash/Surya / Precision/ AKG / BEC
31	Hardware (bolts, nuts, spring, washer etc.)	Unbrako/GKB
32	MCB / ELCB / RCCB	Schneider/ ABB / Legrand/Hager / Siemens
33	Chemical Earthing	Universal Earth Solution / Erico / Pioneer

NOTE :

All the materials to be ISI marked.

The materials shall be only of the approved makes as specified in this.

The contractor shall submit samples of all the makes as specified in this list and the consultant / owner shall have the power to select any of them. Consultant / Owner decision in this regard shall be binding on the contractor.

Consultant / owner decision in this regard shall be binding on the contractor.

In case any material is not available for any one or all of these approved makes the consultant / owner shall select and approve alternative make(s).

SECTION – V

- **Bill of Quantity**

BOQ for "Electrification work of Faculty Housing at IIT Indore"

Sr. No.	Description	Qty.	Unit	Rate	Amount.
	SUB-HEAD-1 (WIRING)				
1	Wiring for light point/ fan point/ exhaust fan point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FR PVC insulated copper conductor single core cable etc as required.				
	Group C	286	Point		
2	Wiring for **twin control** light point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface / recessed medium class **PVC conduit**, 2 way **modular switch**, modular plate, suitable **GI box** and earthing the point with 1.5 sq.mm. FR PVC insulated copper conductor single core cable etc as required. (for Stairs)	11	Point		
3	Wiring for light/ **power plug** with **2X4 sq. mm FR PVC** insulated copper conductor single core cable in surface/ recessed medium class **PVC conduit** alongwith **1 No 4 sq. mm FR PVC** insulated copper conductor single core cable for loop earthing as required. (without plug point)	2,000	Meter		
4	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed medium class **PVC conduit** as required				
5	4 X 6 sq. mm + 2 X 6 sq. mm earth wire (for Light DBs)	450	Meter		
6	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required.				
	25 mm	300	Meter		
	32 mm	200	Meter		
7	Supplying and fixing metal box of following sizes (nominal size) on surface or in recess with suitable size of phenolic laminated sheet cover in front including painting etc as required.				
	75 mm X 75 mm X 60 mm deep	10	Each		

	100 mm X 100 mm X 60 mm deep	10	Each		
	150 mm X 75 mm X 60 mm deep	10	Each		
	180 mm X 100 mm X 60 mm deep	10	Each		
	200 mm X 150 mm X 60 mm deep	10	Each		
8	Supplying and fixing stepped type electronic **fan regulator** on the existing modular plate switch box including connections but excluding modular plate etc. as required.(two module)	31	Each		
9	Supply and fixing of following size/ modules, GI box along with modular base & cover plate for modular switch/ regulator in recess, including connection as required.				
	1or 2 module (75mmx 75mm)	40	Each		
	3 Module (100mm X 75mm)	112	Each		
	4 Module (125mm X 75mm)	18	Each		
	6 Module (200mm X 75mm)	11	Each		
	8 Module (125mm X 125mm)	8	Each		
10	Supplying and fixing suitable size **GI box** with modular plate and cover in front on surface or in recess, including providing and fixing **3 pin** 5/6 amps **modular socket outlet** and **5/6 amps modular switch**, connection etc. as required. (For light plugs to be used in non residential buildings).	42	Each		
11	Supplying and fixing suitable size **GI box** with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 amps **modular socket outlet** and 15/16 amps **modular switch**, connection etc. as required.	70	Each		
12	Supplying and fixing **3 pin, 5 amp ceiling rose** on the existing junction box/ wooden block including connection etc as required.	4	Each		
13	Supplying and fixing brass batten/ angle holder including connection etc. as required.	4	Each		
14	Supply, installation, testing and commissioning of 6/16A water proof power socket for including GI box, hardware connection etc. complete in all respect.	4	Each		
15	Supply, installation, testing and commissioning of Three phase Industrial type Plug boards consisting of 32A 4P RCCB with 32A TPN& E Industrial Plug Socket.- (With Normal Top Cover and male female connector)	5	Nos.		
	TOTAL OF SUBHEAD - 1				

	SUBHEAD-2 (MCB & DB'S)	-			
16	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 volts, on surface/recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator) **(As per SLD DI-IITI-HUB-SLD-11)**				
	8 way (4 + 24), Double door.	6	Each		
17	Supplying and fixing **5 amps to 32 amps rating,** 240/415 volts, **"C" curve, miniature circuit breaker** suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
	Single pole	168	Each		
	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm,made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	2	Each		
18	Supplying and fixing 4P **40 amps rating,** 415 volts, **30mA, RCCB** suitable for inductive load in the DB complete with connections, testing and commissioning etc. as required.	6	Each		
	TOTAL OF SUBHEAD - 2				
	SUB-HEAD-3 (CABLE TRAYS,MV CABLE, CABLE LAYING, JOINTING & END TERMINATION, RCC/GI PIPES)	-			
19	Supplying and installing following size of perforated pre-painted M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc as required.				
	200 mm width X 50 mm depth X 1.6 mm thickness	30	Meter		
20	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.				
	Above 35 sq mm and up to 95 sq mm. (Clamped with 25/40 x 3 mm thick MS Flat Clamp)	100	Meter		

21	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required.				
	Above 35 sq mm and up to 95 sq mm. (Clamped with 25/40 x 3 mm thick MS Flat Clamp)	10	Meter		
22	Supplying and making **end termination** with **brass compression gland and aluminium lugs** for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.	-			
	3½ X 95 sq. mm (45mm)	2	Each		
23	Supplying of following sizes XLPE Insulated & PVC sheathed Aluminum / Copper conductor armoured power cable of 1.1 KV grade ISI marked conf. to IS : 7098 (Pt-1) etc. as required	-			
	95 sq.mm x 3.5 c Al. cable	100	Mtr		
	TOTAL OF SUBHEAD - 3				
	SUB-HEAD-4 (EARTHING)	-			
24	Providing and fixing 6 SWG dia G.I. Wire on surface or in recess for loop earthing along with existing surface / recessed conduit / Submain wiring / cable as required.	20	meter		
25	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required	150	Meter		
26	Providing and fixing 25 mm X 5 mm CU strip on surface or in recess for connections etc. as required	10	Meter		
27	Supplying, installing, testing & commissioning of Maintenance Free Chemical Earthing System consisting of (A) **GI Earth Rod of 3 Mtr x 5/8"** size using earth enhancing compound of 25 Kg & termination clamp.	20	Set		
	TOTAL OF SUBHEAD - 4				
	SUB-HEAD-5 LIGHT FIXTURES & FANS				
28	Installation, testing and commissioning of pre-wired, fluorescent fitting / compact fluorescent /LED fitting of all types, complete with all accessories and tube etc. directly on ceiling/ wall, including connection with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and earthing etc. as required.	268	Each		
29	Supply of Surface/recess mounted following LED fitting with durable housing with AL heat sink with diffuser to give glare free light with removable driver.	156	No		

	1* 40W LED Recess/ Surface mounted type mirror optics luminaire (Wipro Model LM11 "The next Generation LED luminaries or Equivalent) [Shape : Squre]				
30	Supply of Surface/recess mounted following LED fitting with durable housing with AL heat sink with diffuser to give glare free light with removable driver. 4* 6 W Recess/ Surface mounted Downlighter (Wipro Model LD42 "The next Generation LED luminaries or Equivalent) [Shape : Circular]	85	No		
31	Supply of Surface mounted following FTL fitting with durable housing. 1* 28 W Surface mounted FTL (Wipro Model GCF32 or Equivalent) [Shape : Batten Type]	7	No		
32	Supply of Surface/recess mounted following LED fitting with durable housing. 1* 91 W Recess/ Surface mounted Flood Light for Terrace Lighting. (Wipro Model LR 10 or Equivalent) [Shape : Square]	2	No		
	FANS & EXHUAST FAN				
33	Installation, testing and commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq.mm FRLS PVC insulated, copper conductor, single core cable, including providing and fixing phenolic laminated sheet cover on the fan box etc. as required.	31	Each		
34	Supplying and fixing extra down rod of 10 cm length G.I. pipe, 15 mm dia, heavy gauge including painting etc. as required. (Note :More than 5 cm length shall be rounded to the nearest 10 cm and 5 cm or less shall be ignored)	10	Each		
35	Supplying and fixing extra conduit down rod of 20 cm length G.I. pipe 15 mm dia, heavy gauge including painting etc. as required. (Note : More than 5 cm length shall be rounded to the nearest 10 cm and 5 cm or less shall be ignored)	10	Each		
36	Installation of exhaust fan in the existing opening, including making good the damage, connection, testing, commissioning etc. as required.				
	Upto 450 mm sweep	12	Each		
37	Supply of 1200mm sweep 3 blade Ceiling fan complete with assembling of blades, down rod, shackle insulator, canopy etc from approved makes and complete as per direction of Engineer in Charge.	31	No		

38	Supply of Exhaust fan with louver and with 3x1.5 sqmm flexible PVC insulated copper wire of approved make and complete as per direction of Engineer in Charge.				
	250/300 mm sweep	12	No		
	TOTAL OF SUBHEAD - 5	-			
	SUB-HEAD-6 (OUTDOOR LIGHTING)				
39	Supply, Installation, Testing and Commissioning of 1X6W LED Ground Monted Building Focused Outdoor Light (Make:-Wipro/Bajaj/KLight Equivalent)	6	No		
40	Supply, Installation, Testing and Commissioning of 1X9W BOLLARD LED for Outdoor Lighting (Make:-Bajaj/Wipro Equivalent)	7	No		
	TOTAL OF SUBHEAD -6				
	SUB-HEAD-7 (ELV SYSTEM)				
41	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed steel/ PVC conduit as required.	200	Meter		
42	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.				
	2 Pair	300	Meter		
	4 Pair	150	Meter		
43	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	100	Meter		
44	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required.				
	25 mm	300	Meter		
45	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
	Telephone socket outlet	15	Each		
	TV antenna socket outlet	2	Each		
46	Supply and fixing of following size/ modules, GI box along with modular base & cover plate for modular switch/ regulator in recess, including				

	connection as required.				
	2 module (75mmx 75mm)	15	Each		
47	Supply, Installation testing and commissioning of telephone Tag block Krone connector with enclosure and lock complete as mentioned below :-				
	10 Pair	50	Each		
48	Supply of faceplate 3"x3" (dual with shutters) for data, telephone and camera complete in all respect.	14	Each		
49	supply of CAT6 RJ45 I/O (in surface mount box) for wireless AP	20	Each		
50	Supply, Installation and testing and commissioning of CAT6 RJ45 I/O with a separator to eliminate crosstalk	10	Each		
51	Installation testing and commissioning of faceplate (single or double on concealed wall mounted boxes) Impacting of I/Os (CAT6 RJ45 I/O) & Installation and impacting of surface mount boxes (Including labeling) including hardware etc complete in all respect.	42	Each		
52	Installation, testing and commissioning of Racks & LIU including hardware etc complete in all respect.	5	Each		
53	Installation, testing and commissioning /Impacting of Patch panel in Racks including hardware etc complete in all respect.	5	Each		
54	Termination of CAT 6 cable in patch panel and termination of OFC at LIU in Rack including hardware etc complete in all respect.	84	Each		
55	Supplying and embedding of following sizes of under floor trunking made out of 1.6 mm thick aluminum including Jointing sleeves, floor fixing supports, chipping and levelling that portion of the floor etc in the floor / in recess etc as per specifications complete as required.				
	100 mm x 40 mm - single compartment	434	Meter		
56	Supply, Installation, testing of LAN Point - RJ-45. The board shall be modular plate type construction.	42	Nos.		
	TOTAL OF SUBHEAD -7				
	SUB-HEAD-8 (ELECTRICAL PANEL)				
57	Supply Installation, Testing & Commissioning of main distribution panel as per drawing no. DI-IITI-HUB-SLD-01 Summery of feeders : Panel (Utility Main.) : Comprising of, I/C-200A 4P MCCB (2Nos.); B/C : 200A (1Nos.) O/Gs- 100A (1No.), 63A (6Nos.), 40A 4P MCCB (8Nos.), 32A DP MCB (6Nos.), 20A DP MCB (6Nos.), 16A SP MCB (6Nos.); (Refer SLD DI-IITI-HUB-SLD-01, for all	1	Nos.		

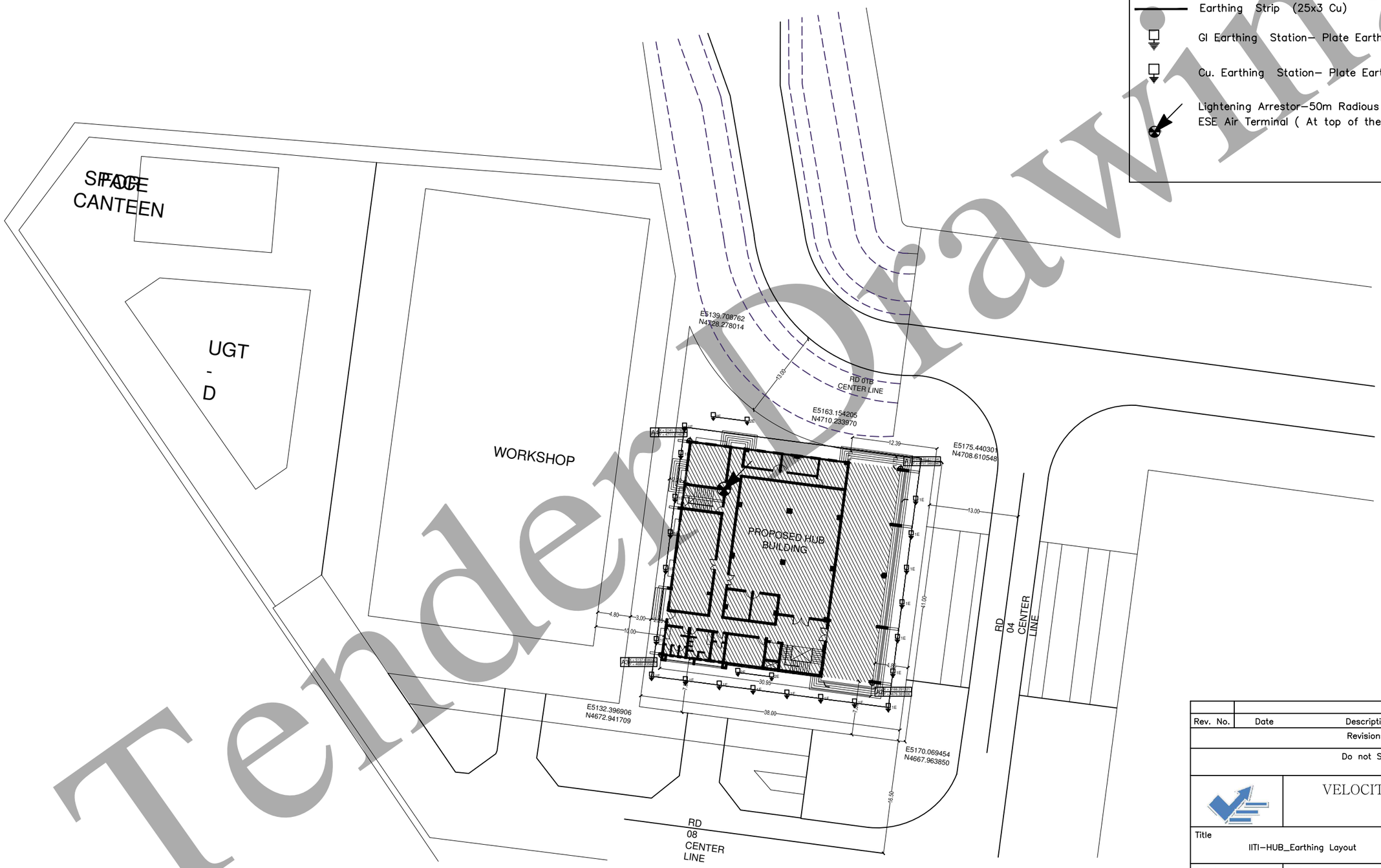
	specifications).				
58	Supply Installation, Testing & Commissioning of External Lighting panel as per drawing no. DI-IITI-HUB-SLD-13 Summery of feeders : Panel (External Lighting) : Comprising of, I/C-63A 4P MCCB (1Nos.); O/Gs- 32A 4P MCB (3Nos.), 25A 4P MCB (3Nos.), 16A DP MCB (1Nos.); (Refer SLD DI-IITI-HUB-SLD-13, for all specifications).	1	Nos.		
	SUB-HEAD-8 (ELECTRICAL PANEL)				
	SUBHEAD -9 (PIR SENSOR)				
59	Supplying, installation, testing and commissioning of Passive Infrared (PIR) technology based occupancy sensor with day light dimming (lighting level shall be regulated as per availability of natural day light in an area along with occupancy detection.) having high performance, regulating programmable type, suitable for connected load upto 10 Amp , for mounting height up to 2.8 mtr and for 5 m diameter coverage area along with necessary fixing arrangements i/c programming at site etc. complete as required.	16	Nos.		
	TOTAL OF SUBHEAD -9				
	SUBHEAD -10 (CCTV)				
60	Supply and installation of 25mm Dia PVC conduit as specified in specification with all accessories and junction boxes.	100	Meter		
61	Supply, installation, laying and Termination of 4C* 1 Sq. mm Twisted and screened cable for camera power	200	Meter		
62	Supply, installation, laying and Termination of RG11 Co-axial cable for Camera to DVR.	200	Meter		
63	Supply, laying and connection CAT-6A (CAT6A Data wire (U/FTP Cable , up to 650 MHz) cable for interconnection of various CCTV Cameras and NVR system. Termination of these cables at Camera ends shall be a part of the scope of work. All CCTV wiring shall be carried out using Cat 6A Cable in heavy duty PVC conduit. PVC Conduits will be Installed by Electrical Contractor The Scope also include Puchning at both the end of Cat6A cable. Colour code for CCTV cables – Gray color. Contractor has to calculate actual requirement of Cable for CCTV, Redundant and other accessories and accordingly arrange the cable.	200	Meter		
	TOTAL OF SUBHEAD -10				

	SUBHEAD -11 (FIRE ALARM SYSTEM)				
64	Supply and installation of 25mm Dia PVC conduit as specified in specification with all accessories and junction boxes.	100	Meter		
65	Supplying, installing testing & commissioning of screened PVC insulated Ar. FRLS 2 Core of 1.5Sq mm Size cable (as recommended by FAS equipment supplie. The cable shall be confirming to IS statndards and specifications.	400	Meter		
	TOTAL OF SUBHEAD -11				
	SUBHEAD -12(ACCESS SYSTEM)				
66	Supply and installation of 25mm Dia PVC conduit as specified in specification with all accessories and **junction** boxes.	100	Meter		
67	Supplying, installing testing & commissioning of screened PVC insulated Ar. FRLS 2 Core of 1.5Sq mm Size cable (as recommended by FAS equipment supplie. The cable shall be confirming to IS standards and specifications.	200	Meter		
68	Supplying, installing testing & commissioning of screened PVC insulated Ar. FRLS 6 Core of 1.5Sq mm Size cable (as recommended by equipment supplier. The cable shall be confirming to IS standards and specifications.	200	Meter		
	TOTAL OF SUBHEAD -12				
	SUBHEAD -13 (LIGHTENING PROTECTION)				
69	Supplying, installation, testing and commissioning of early stimmer emission (CESE) lightning conductor. Equiped with a tinned copper central pick up rod. Full electrical continuity between the tip and earth point. Fully autonomous (No battery no external power supply required). Collect ambient energy through a lower series of electrods. Timing of the streamer emission controlled with an electronic device that detects the lightning and triggeres a streamer (3.5kV and 20A). Manufactures as per NFC-70-102. A tester/ testing process corresponding specifically to the air terminal shall be available for the maintenance and ensure the healthiness of the unit. An external solar panel shall energize the integrated test ciuit during testing process. This test should preferably be carried out with wireless remote control within a distance of 50 Mts. So, no access to the air terminal is required. Tested in high voltage laboratory (CPRI) as well as in real lighting type Lightning arrestor with the Lightning Air Terminal - Configured as a Spheroid which is comprised of separate electrically isolated 4panels	1	Nos.		

	surrounding an Earthened Central Finial. The upper section of the central finial shall be rated to withstand 200KA. The Insulation material used to electrically isolate the panels shall be comprised of base polymer which provides high Ozone & UV resistance with a di-electric strength of 24-38KV/mm & ESE terminal shall withstand a minimum Switching Impulse Voltage of 500KV tested as per NFC 17-102 & IEC Test Standard - IEC60-1:1989.				
70	Supply of Remote Control unit required only for testing and prevention air terminal.	1	Nos.		
71	Supply & fixing of single core 70 sq mm pure electrolytic PVC insulated flexible copper conductor cable and laying the same form the air terminal to earth pits complete as required. The downconductor shall consist of Electrical grade Copper, minimum 70Sq.mm cross-sectional area. Tasted as per ISI 694 Over all dia 15.5mm.The downconductor should be fixed via conductive mounting clamps. If height og building is more than 60Mtr use 02Nos of Downconductor.	100	Meter		
72	Supply of GI Elevation Pole (with reducer) to fix the LA unit, base plate, clamps and all required fixing accessories (ready to install)	1	Nos.		
	TOTAL OF SUBHEAD -13				
	TOTAL AMOUNT (in Figure)				
	TOTAL AMOUNT (in Words)				

SECTION – V

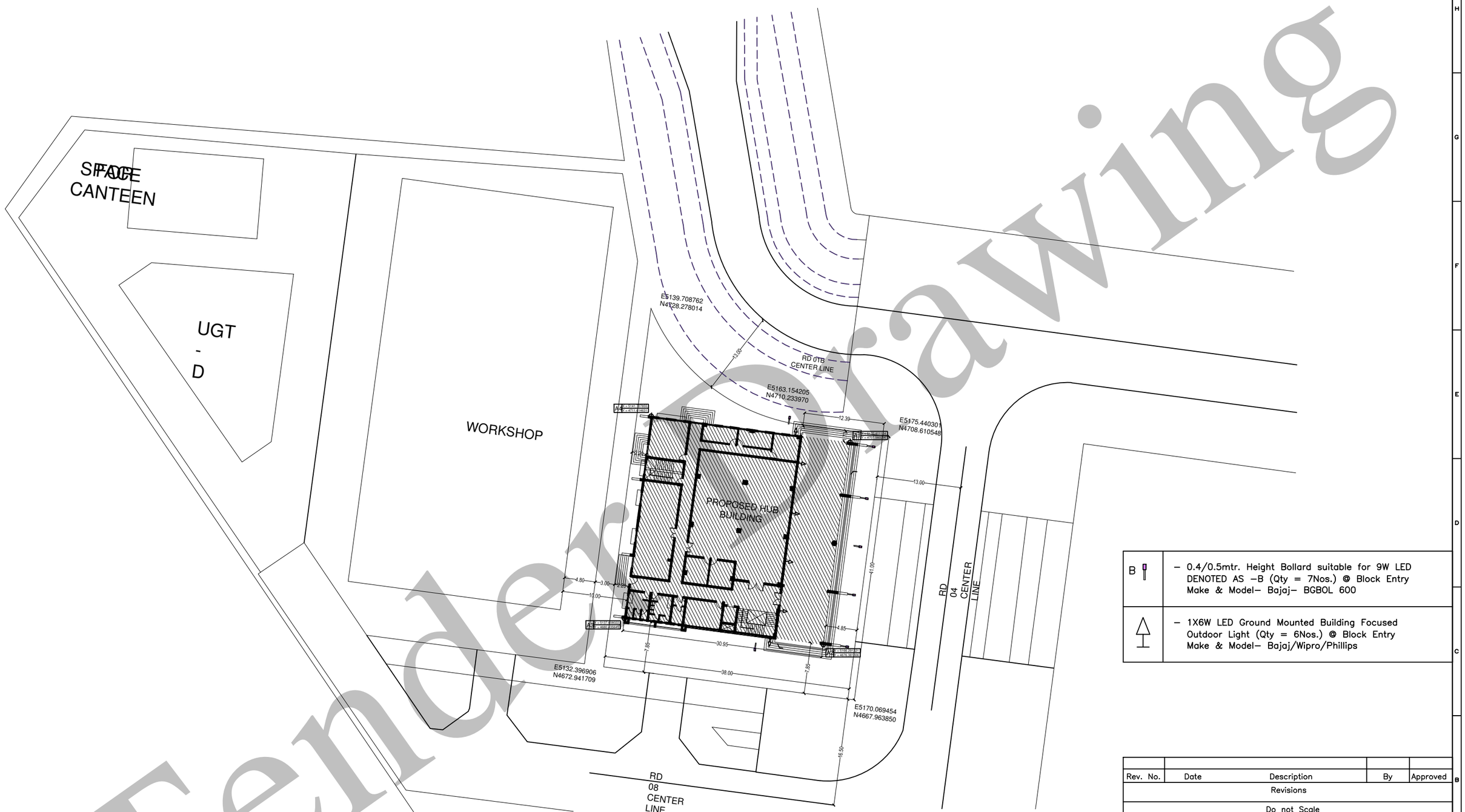
- **Tender Drawings**



Rev. No.	Date	Description	By	Approved
		Revisions		
		Do not Scale		

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_Earthing Layout		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: KD Checked: KD Approved: SK	
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–Earthing–LAY–01	Sheet: 1 of 1 Size: A2 Rev.–0



B – 0.4/0.5mtr. Height Bollard suitable for 9W LED DENOTED AS –B (Qty = 7Nos.) @ Block Entry
Make & Model– Bajaj– BGBOL 600

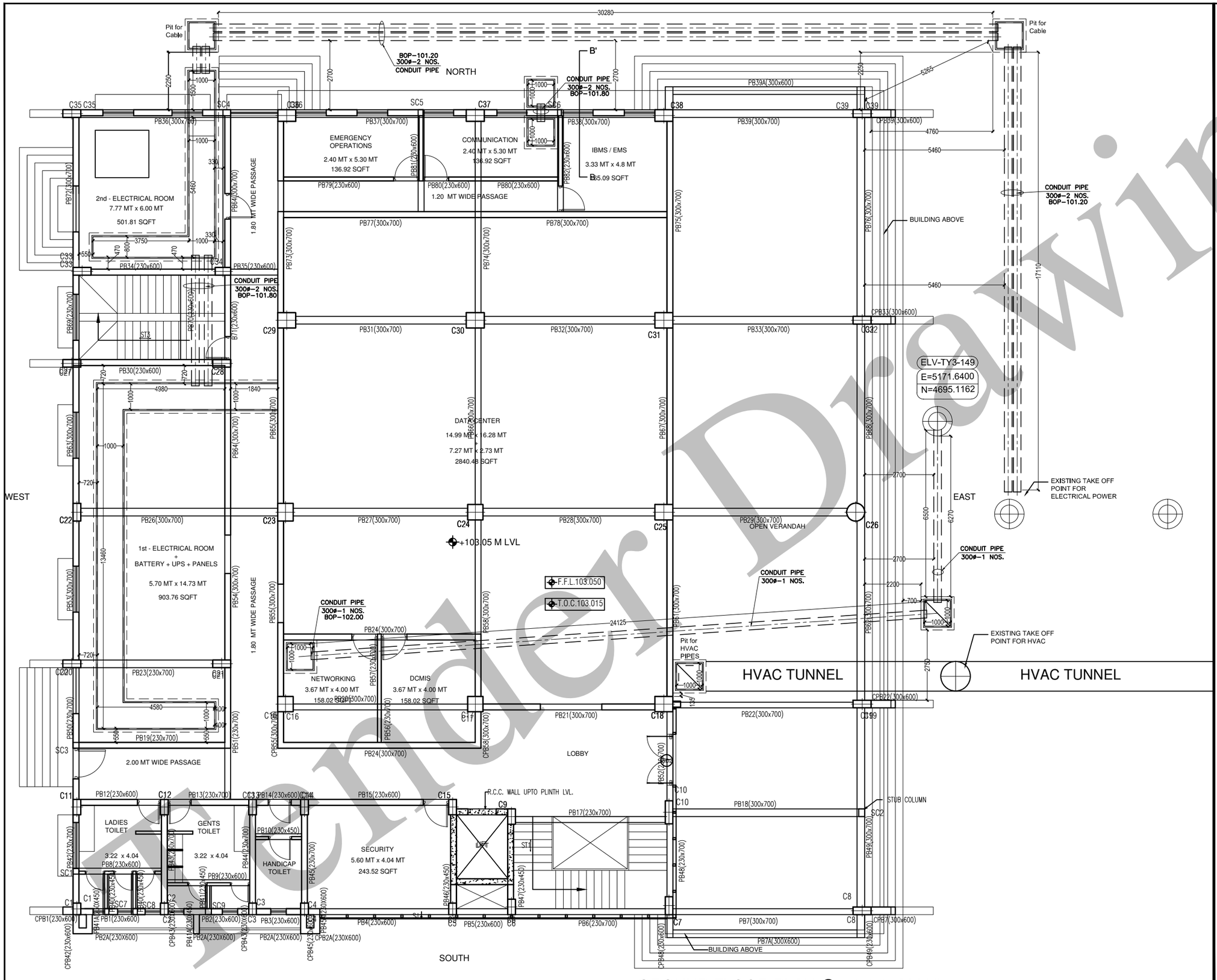
– 1X6W LED Ground Mounted Building Focused Outdoor Light (Qty = 6Nos.) @ Block Entry
Make & Model– Bajaj/Wipro/Phillips

Rev. No.	Date	Description	By	Approved
		Revisions		

Do not Scale

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_External_Lighting_Layout		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: KD Checked: KD Approved: SK	
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–ELGT–LAY–01	Sheet: 1 of 1 Size: A2 Rev.–0



GROUND FLOOR PLAN @+103.05 M LVL

WORKING DRAWINGS

NO.	DESCRIPTION	DATE	DRAWN BY

REVISIONS

DISTRIBUTION OF PRINTS

DATE	DRG. NO.	REV. NO.	NO. OF PRINTS

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Drawings are NOT to be SCALED, written dimensions are to be followed.

NOTE:-

DATE	06/11/2016
SCALE	1:100
DRAWN	VW
CHECKED	RK
APPROVED	PP
SHEET SIZE	A2- 596 mm x 420 mm
FILE NAME	

CLIENT
INDIAN INSTITUTE OF TECHNOLOGY (INDORE)

PROJECT
HUB BUILDING

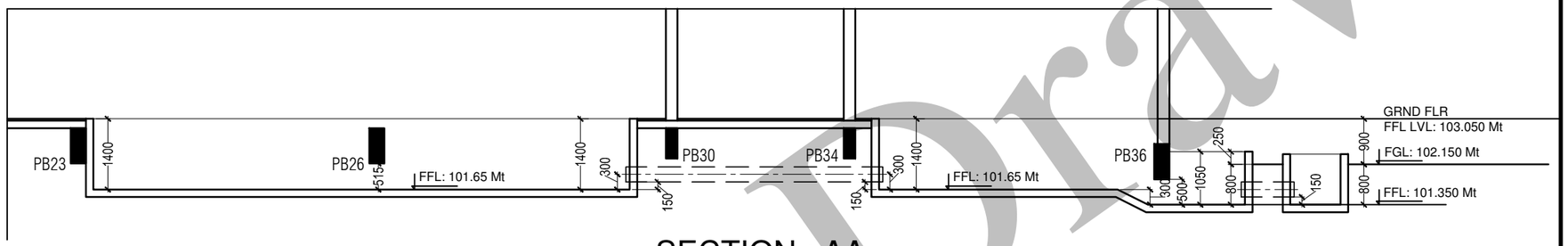
CONTRACTOR

DESIGN IDEAS
102,VASANT KUNJ, PLT NO.163/E,
OFF DR. AMBEDKAR ROAD, OPP PARSEE GYMKHANA,
DADAR (EAST), CENTRAL MUMBAI-14
TELE : 24118778,24131712

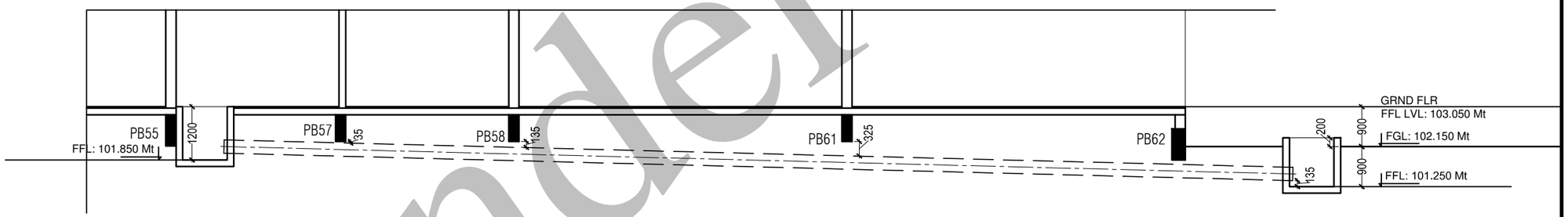
NORTH

SHEET TITLE
PLAN
ELECTRICAL , HVAC & DATA TRENCH LAYOUT @GROUND FLOOR PLAN

PROJECT NO.
DWG. NO. 1
REV. NO. R-1



SECTION : AA



SECTION : BB

WORKING DRAWINGS

NO.	DESCRIPTION	DATE	DRAWN BY

REVISIONS

DATE	DRG. NO.	REV. NO.	NO. OF PRINTS

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Drawings are NOT to be SCALED, written dimensions are to be followed.

NOTE:-

DATE	06/11/2016
SCALE	1:100
DRAWN	VW
CHECKED	RK
APPROVED	PP
SHEET SIZE	A2- 596 mm x 420 mm
FILE NAME	

CLIENT
INDIAN INSTITUTE OF TECHNOLOGY (INDORE)

PROJECT
HUB BUILDING

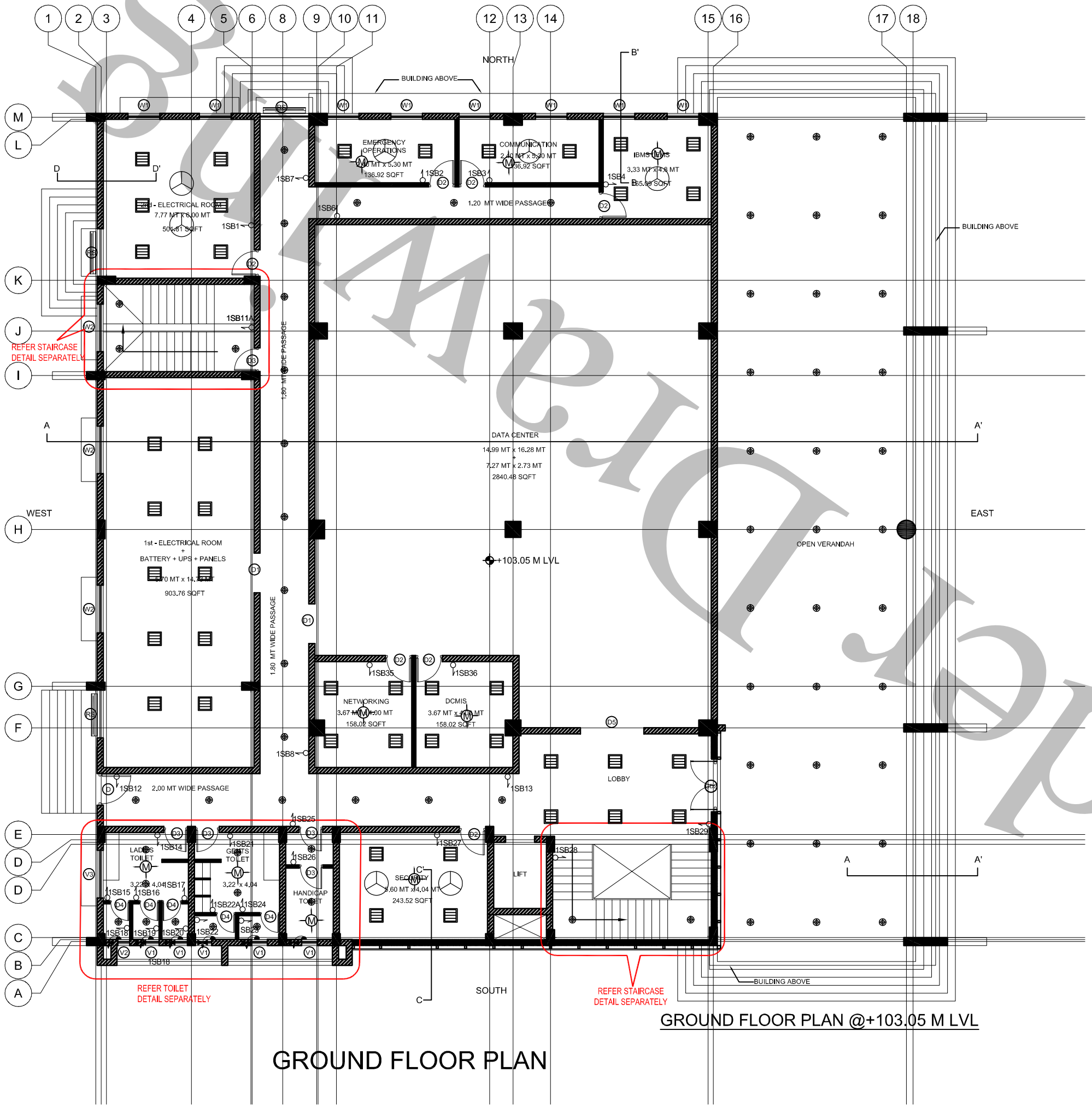
CONTRACTOR

DESIGN IDEAS
102,VASANT KUNJ, PLT NO.163/E,
OFF DR. AMBEDKAR ROAD, OPP PARSEE GYMKHANA,
DADAR (EAST), CENTRAL MUMBAI-14
TELE : 24118778,24131712

NORTH

SHEET TITLE
PLAN
ELECTRICAL , HVAC & DATA TRENCH SECTIONS @GROUND FLOOR PLAN

PROJECT NO.
DWG. NO. 2
REV. NO. R-1



GROUND FLOOR PLAN @+103.05 M LVL

GROUND FLOOR PLAN

Legends :

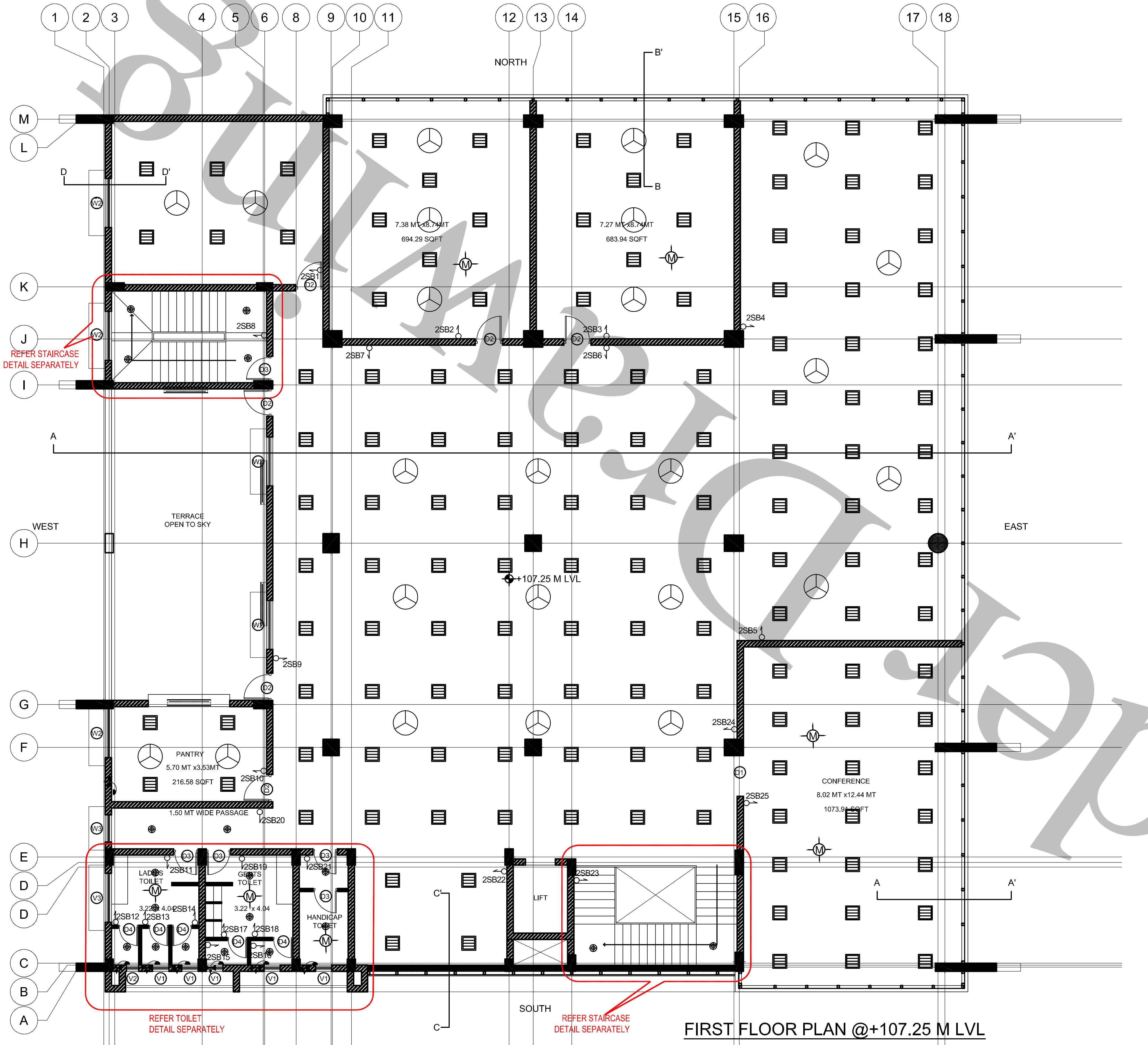
Sr. No.	Symbol	Description
1.0	*M*	1* 36W LED Recess/ Surface mounted type mirror optics luminaire (Wipro Model LM11 "The next Generation LED luminaries) [Shape : Squre]
2.0	*D*	4* 6 W Recess/ Surface mounted Downlighter (Wipro Model LD42 "The next Generation LED luminaries) [Shape : Circular]
3.0	*T*	1* 28 W surface mounted FTL (Wipro Model GFC32), 1180mm
4.0	*F*	Ceiling fans (Usha/Orient) (36" Dia) complete
5.0	*E*	12"dia.(1400 r.p.m.) Exhaust Fan with bird guard screen and gravity louvres complete.
6.0		Switch Board
7.0		PIR Occupancy Sensor

Rev. No.	Date	Description	By	Approved
		Revisions		

Do not Scale

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_Lighting Layout_Ground Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: H. Lele Checked: H. Lele Approved: SK	
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–LGT–LAY–01	Sheet: 1 of 3
			Size: A2 Rev.–01



FIRST FLOOR PLAN @+107.25 M LVL

FIRST FLOOR PLAN

Legends :

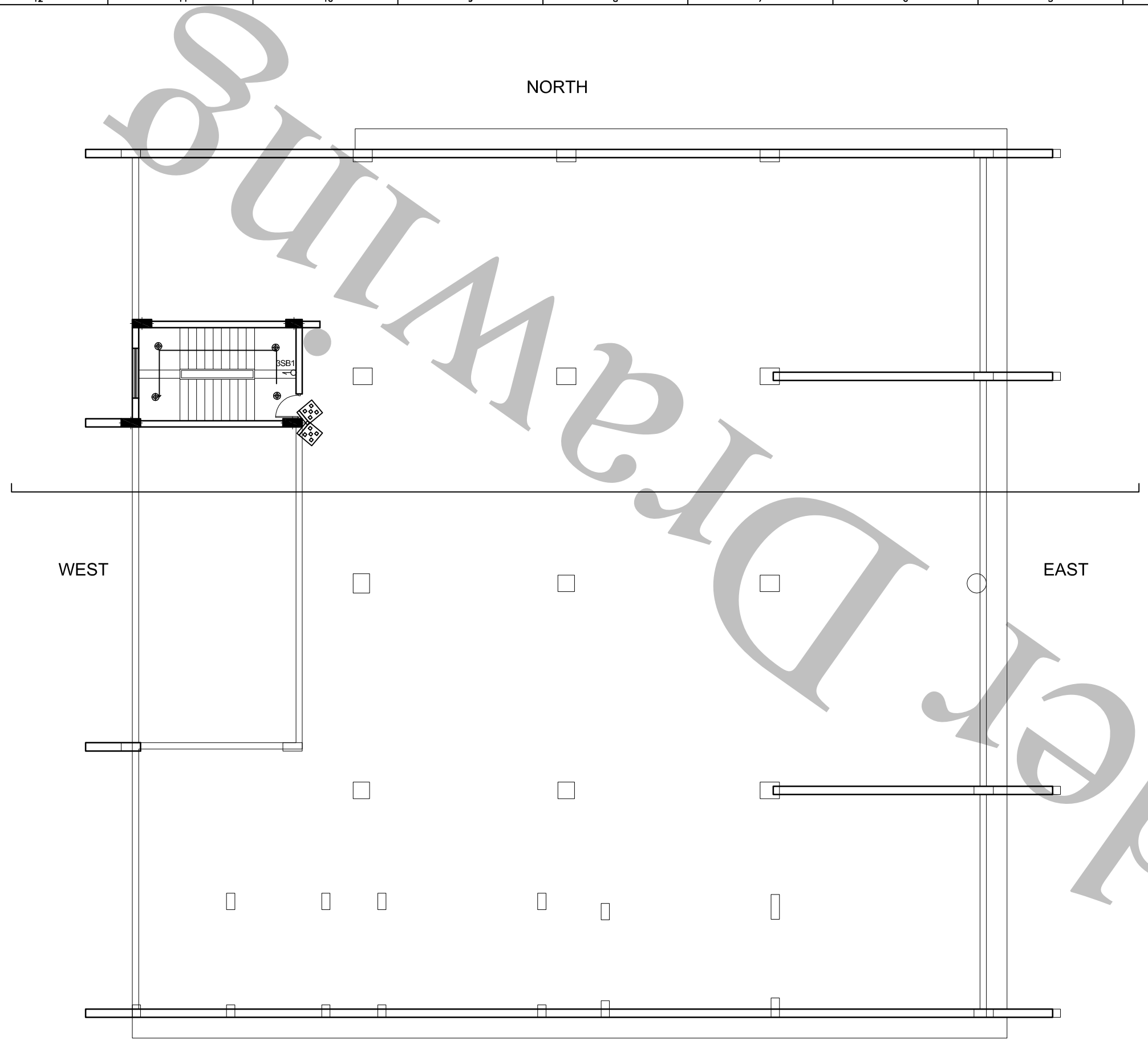
Sr. No.	Symbol	Description
1.0	*M*	1* 36W LED Recess/ Surface mounted type mirror optics luminaire (Wipro Model LM11 "The next Generation LED luminaries) [Shape : Squre]
2.0	*D*	4* 6 W Recess/ Surface mounted Downlighter (Wipro Model LD42 "The next Generation LED luminaries) [Shape : Circular]
3.0	*T*	1* 28 W surface mounted FTL (Wipro Model GFC32), 1180mm
4.0	*F*	Ceiling fans (Usha/Orient) (36" Dia) complete
5.0	*E*	12"dia.(1400 r.p.m.) Exhaust Fan with bird guard screen and gravity louvres complete.
6.0		Switch Board
7.0	M	PIR Occupancy Sensor

Rev. No.	Date	Description	By	Approved
		Revisions		

Do not Scale

VELOCITY ENGINEERING
INDORE

Title	IITI–HUB_Lighting Layout_First Floor	Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: H. Lele; Checked: H. Lele; Approved: SK	
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–LGT–LAY–01	Sheet: 2 of 3; Size: A2; Rev.–01



FIRST FLOOR PLAN @+111.45 M LVL

Legends :

Sr. No.	Symbol	Description
1.0	*F*	1* 100W LED Surface mounted flood luminaries (Wipro Model LM11 "The next Generation LED luminaries) [Shape : Squre]
2.0	*D*	4* 6 W Recess/ Surface mounted Downlighter (Wipro Model LD42 "The next Generation LED luminaries) [Shape : Circular]
3.0		Switch Board

Rev. No.	Date	Description	By	Approved
		Revisions		

Do not Scale

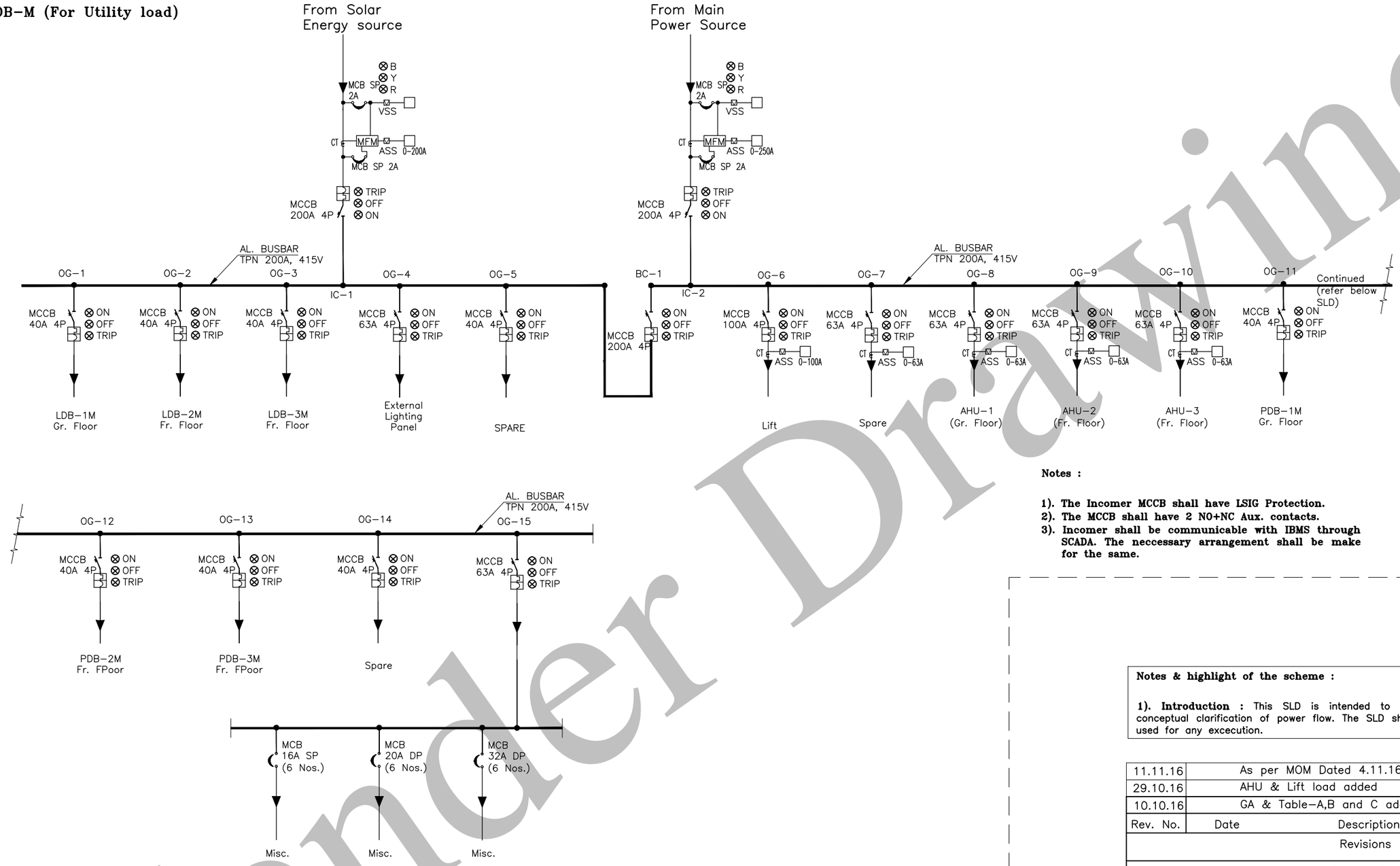
VELOCITY ENGINEERING
INDORE

Title	Status	Purpose
IITI–HUB_Lighting Layout_Terrace Floor	Preliminary	Approval

Client	Project		
Design Ideas	IITI HUB Building	Drawn	H. Lele
		Checked	H. Lele
		Approved	SK

Date	Scale	Drg. No.	Sheet	Size
11.04.16	NTS	DI–IITI–HUB–LGT–LAY–01	3 of 3	A2
				Rev.–01

MDB–M (For Utility load)



Notes :

1). The Incomer MCCB shall have LSIG Protection.
2). The MCCB shall have 2 NO+NC Aux. contacts.
3). Incomer shall be communicable with IBMS through SCADA. The neccessary arrangement shall be make for the same.

Notes & highlight of the scheme :

1). Introduction : This SLD is intended to enable the conceptual clarification of power flow. The SLD shall not be used for any excecution.

Rev. No.	Date	Description	By	Approved
1	11.11.16	As per MOM Dated 4.11.16	KD	
2	29.10.16	AHU & Lift load added	KD	
3	10.10.16	GA & Table–A,B and C added	KD	

Revisions

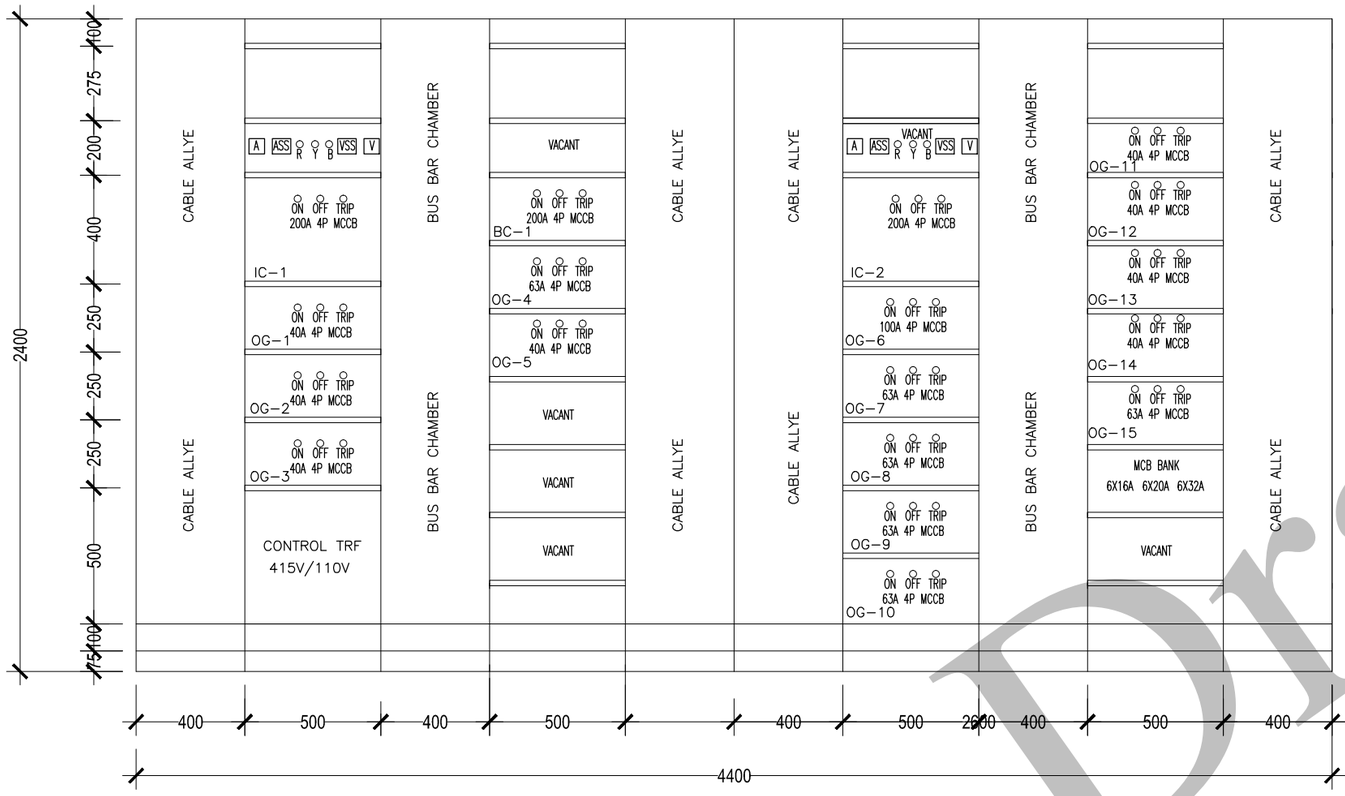
Do not Scale

VELOCITY ENGINEERING
INDORE

Title	Status	Purpose
IITI–HUB_SLD of Utility Main Electrical Panel	Preliminary	Approval

Client	Project		
Design Ideas	IITI HUB Building	Drawn	KD
		Checked	KD
		Approved	

Date	Scale	Drg. No.	Sheet	Size A2
15.04.16	NTS	DI–IITI–HUB–SLD–01	1 of 2	Rev.– 3



Summary of Main Panel 'Utility' (MDB-M)

No.	Description	Connected kW	P. F.	D. F.	Factored (KW)	Voltage (kW)	FLC
1.	AHU-1 (Gr. Floor)	20.000	0.900	0.600	10.800	0.415	15.025
2.	AHU-2 (Fr. Floor)	20.000	0.900	0.600	10.800	0.415	15.025
3.	AHU-3 (Fr. Floor)	20.000	0.900	0.600	10.800	0.415	15.025
4.	Lift	40.000	0.900	0.500	18.000	0.415	25.042
5.	LDB-1M	14.500	1.000	0.900	13.050	0.415	18.156
8.	LDB-4M	40.000	1.000	0.900	36.000	0.415	50.085
11.	PDB-1M	5.000	1.000	0.200	1.000	0.415	1.391
12.	PDB-2M	5.000	1.000	0.200	1.000	0.415	1.391
Total Connected Load				--	--	--	141.142
Total Maximum Demand Load		**141.142**					

Table–B : General Constructional features

1.0	**Electrical Power system for LT :**	
1.1	Power System	3 Phase, 4 Wire, 415V ±10%, 50 Hz ±5%.
1.2	Rated Insulation Voltage	1000V.
1.3	Short Time Rating	50KA for 1 sec.
2.0	**General Construction Features :**	
2.1	Panel shall be Floor mounted, Free standing, Single front, Compartmentized provided with individual feeder/ component I.D. and suitable segregator. (The MCB feeder bank shall in common compartment)	
2.2	Degree of Protection :– IP42	
2.3	Paint Shade (Powder Coated) :– Siemens Grey (RAL 7032/ 7035)	
2.4	Maximum Panel height shall be 2400mm. With Following case : Maximum Working/Operating Height : 1800mm Minimum Working/Operating Height : 275mm–300mm.	
2.5	Cable Entry : For IC & OG cable entry from bottom.	
2.6	Steel Sheet thickness : Door– 1.6mm, Load bearing member– 3.0mm, Rest part–2.0mm.	
2.7	The Bus bar material shall be of Electrical grade Aluminum (Current density 0.8A/Sq.mm shall be considered).	
2.6	The main three Phase, Neutral and Earth bus bar shall be extended throughout the entire length of panel. It shall be with predrilled holes at the ends for future extension.	
2.7	Bus bars shall be covered with coloured insulating sleeves throughout the length for Phase indication. Earth bus shall be identified with green sleeve. Live part shall be suitably shrouded.	
2.8	Horizontal and vertical bus bar section covers shall be provided with engraved danger notice plate reveted to the cover. The cover shall be fastened with zinc plated bolt.	
2.9	Wire size shall be as per rating for Power Ckt., 2.5 Sq.mm for CT Ckt. & 1.5 Sq.mm. for Control Ckt.	
2.10	"Bi–Metalic" Lugs shall be used in case of Aluminium to copper connections,	
2.11	The feeder allocation shall be as per the design of manufacturer subject to approval by client/ consultant.	

Table-A : Terminal arrangement for termination for external cables.

Sr.No.	Feeder Rating	Termination Arrangement
1.	200A	TPN Terminals 120 sq.mm (Stud Type)
2.	100A	TPN Terminals 70 sq.mm (Stud Type)
3.	63A	TPN Terminals 35 sq.mm (Stud Type)
4.	40A	TPN Terminals 16 sq.mm (Stud Type)
5.	For control & CT ckt.	TPN Terminals 6 sq.mm (Stud Type)

Table–C : Legend (for reference)

Sr.No.	Symbol/ Code	Description
01	A	Analog Ammeter
02	ASS	Ammeter Selector Switch
03	V	Analog Voltmeter
04	VSS	Voltmeter Selector Switch
01	CT	Current Transformer
01	MFM	Digital Multifunction Meter (Mim. Perameters A, V, PF, Hz, KW, KVA, KWh, KVArh, Hz)

Notes :

1). Introduction : This GA is intended to enable the conceptual clarification. The final GA shall be submitted by the supplier.

Rev. No.	Date	Description	By	Approved
11.11.16		As per MOM Dated 4.11.16	KD	
29.10.16		AHU & Lift load added	KD	
10.10.16		GA & Table–A,B and C added	KD	

Revisions

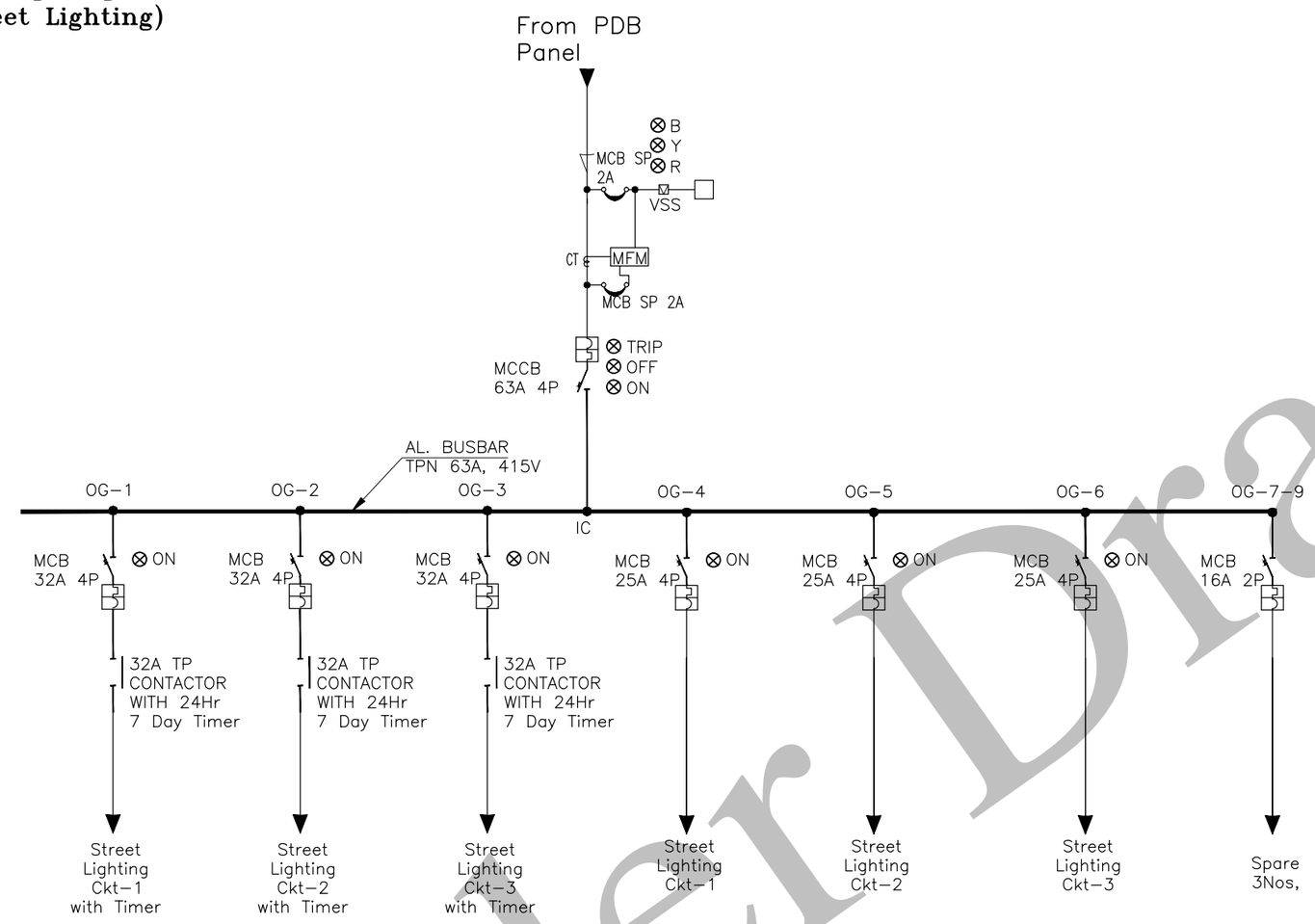
IITI–HUB_SLD of Utility Main Electrical Panel Preliminary Approval

Do not Scale

VELOCITY ENGINEERING
INDORE

Title		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: KD Checked: KD Approved:	
Date: 15.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–SLD–01	Sheet: 2 of 2
			Size: A2 Rev.– 3

External Lighting Panel (For Street Lighting)



Table–1 : General Features

1. **Selector Switch Will be provided for Auto/ Manual Selection.**
2. **Wall Mouting Type, with Top/ Bottom Cable Entry.**

Notes & highlight of the scheme :

1). Introduction : This SLD is intended to enable the conceptual clarification of power flow. The SLD shall not be used for any excecution.

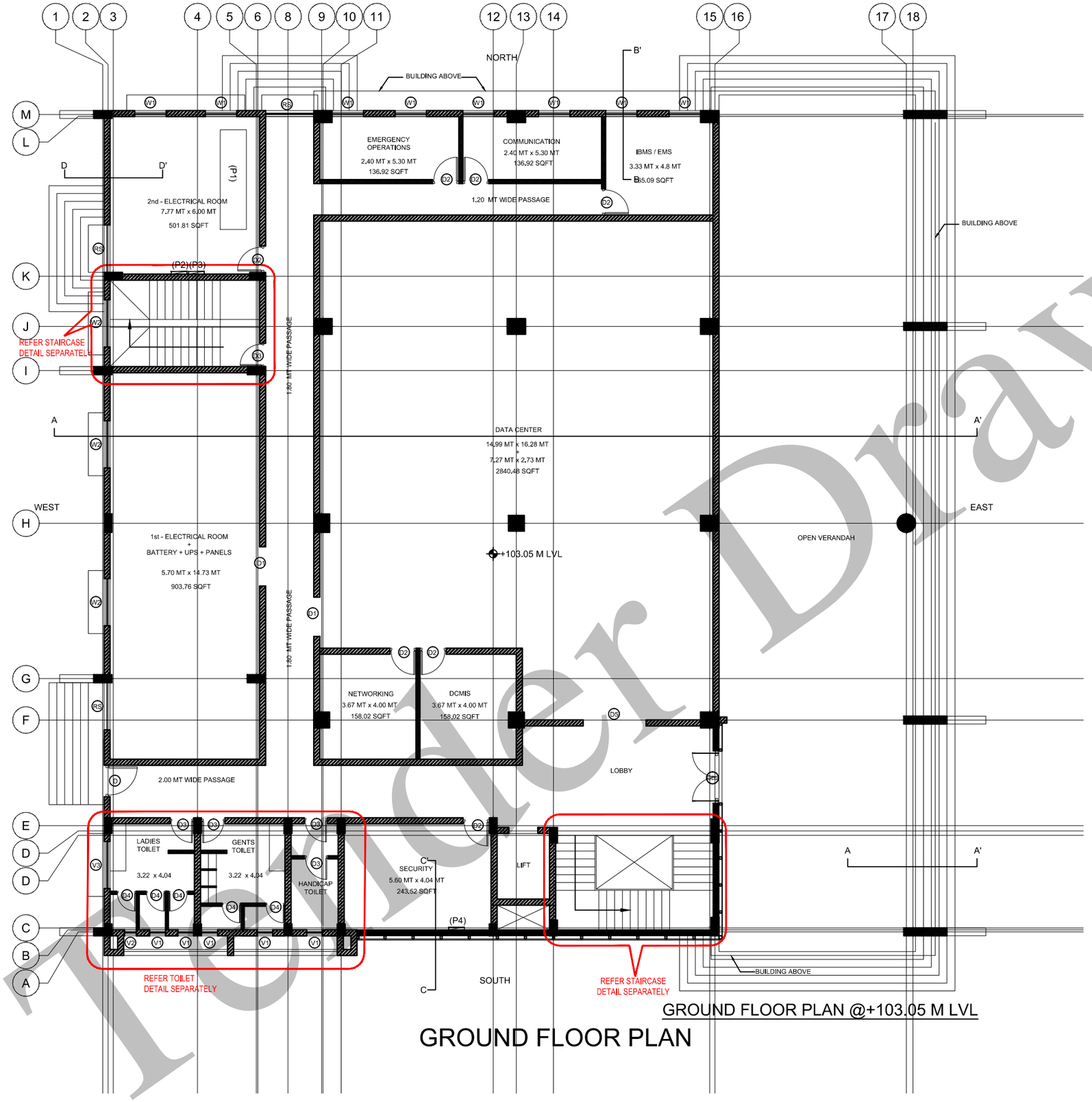
Rev. No.	Date	Description	By	Approved
	11.11.16	FOR APPROVAL	KD	

Revisions

Do not Scale

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_SLD of EXTERNAL LIGHT PANEL		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: KD Checked: KD Approved:	
Date: 06.11.16	Scale: NTS	Drg. No.: DI–IITI–HUB–SLD–13	Sheet: 1 of 1
			Size: A3 Rev.– 0



GROUND FLOOR PLAN @+103.05 M LVL

GROUND FLOOR PLAN

Legends :

Sr. No.	Symbol	Description
1).	(P1)	MDB-M (UTILITY MAIN)
2).	(P2)	LDB-1M
3).	(P3)	PDB-1M
4).	(P4)	External Lighting DB
5).	(P5)	LDB-2M
6).	(P6)	PDB-2M
7).	(P7)	LDB-3M
8).	(P8)	PDB-3M

ABBREVIATION DETAILS :

1). MDB (M) - MAIN ELECTRICAL PANEL (MAIN)
2). MDB (E) - MAIN ELECTRICAL PANEL (EMERGENCY)
3). LDB (M) - LOCAL DISTRIBUTION BOARD (MAIN)
4). LDB (E) - LOCAL DISTRIBUTION BOARD (EMERGENCY)

Notes :

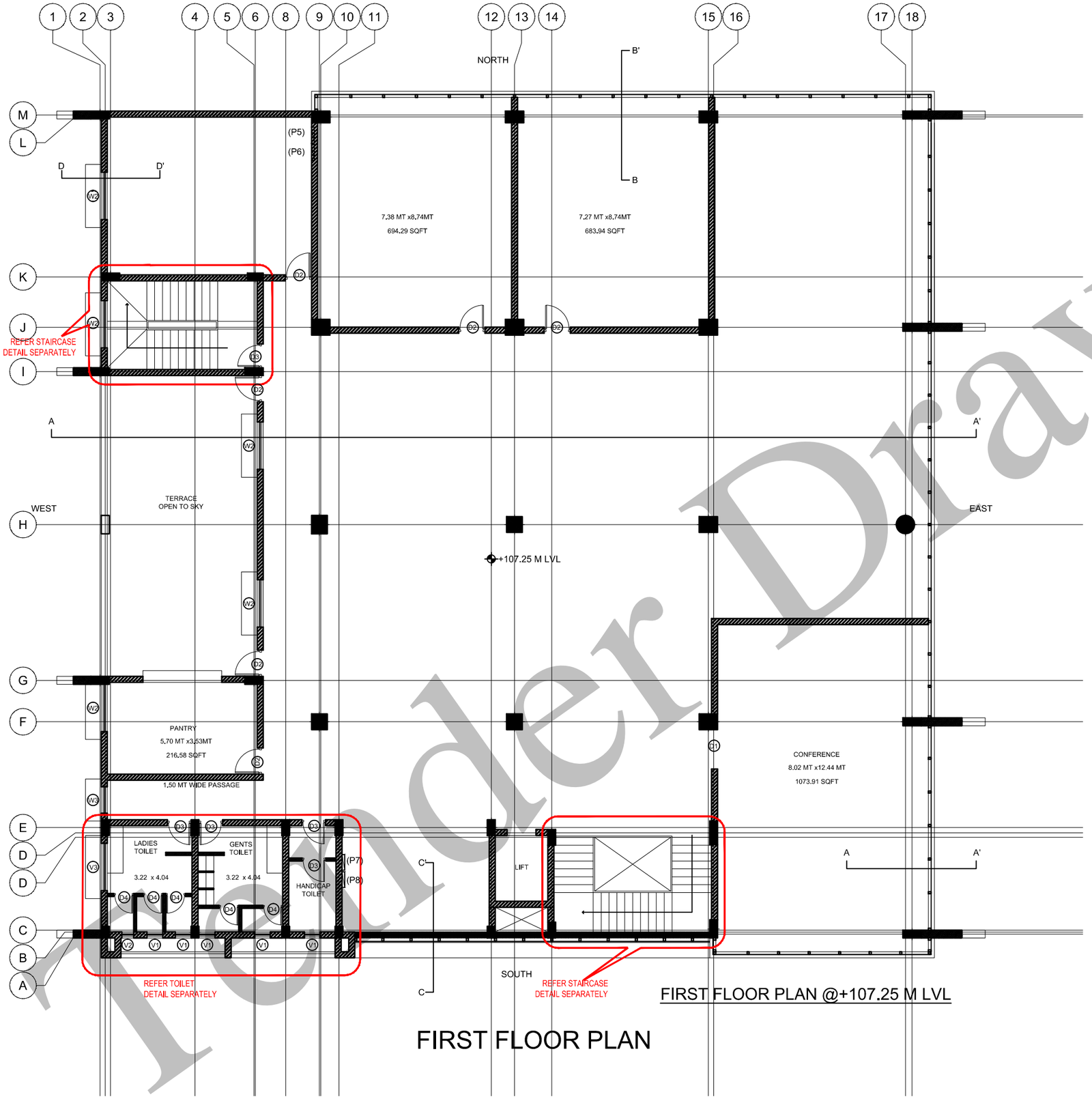
1). The LDB/PDB shall be concealed and mounting hieght shall be as per the standards.

Rev. No.	Date	Description	By	Approved
		Revisions		

Do not Scale

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_Panel Layout_Ground Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: H. Lele Checked: H. Lele Approved: SK	
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–PANEL–LAY–01	Sheet: 1 of 2 Size: A2 Rev.–01



FIRST FLOOR PLAN @+107.25 M LVL

FIRST FLOOR PLAN

Legends :

Sr. No.	Symbol	Description
1).	(P1)	MDB-M (UTILITY MAIN)
2).	(P2)	LDB-1M
3).	(P3)	PDB-1M
4).	(P4)	External Lighting DB
5).	(P5)	LDB-2M
6).	(P6)	PDB-2M
7).	(P7)	LDB-3M
8).	(P8)	PDB-3M

ABBREVIATION DETAILS :

1). MDB (M) - MAIN ELECTRICAL PANEL (MAIN)
2). MDB (E) - MAIN ELECTRICAL PANEL (EMERGENCY)
3). LDB (M) - LOCAL DISTRIBUTION BOARD (MAIN)
4). LDB (E) - LOCAL DISTRIBUTION BOARD (EMERGENCY)

Notes :

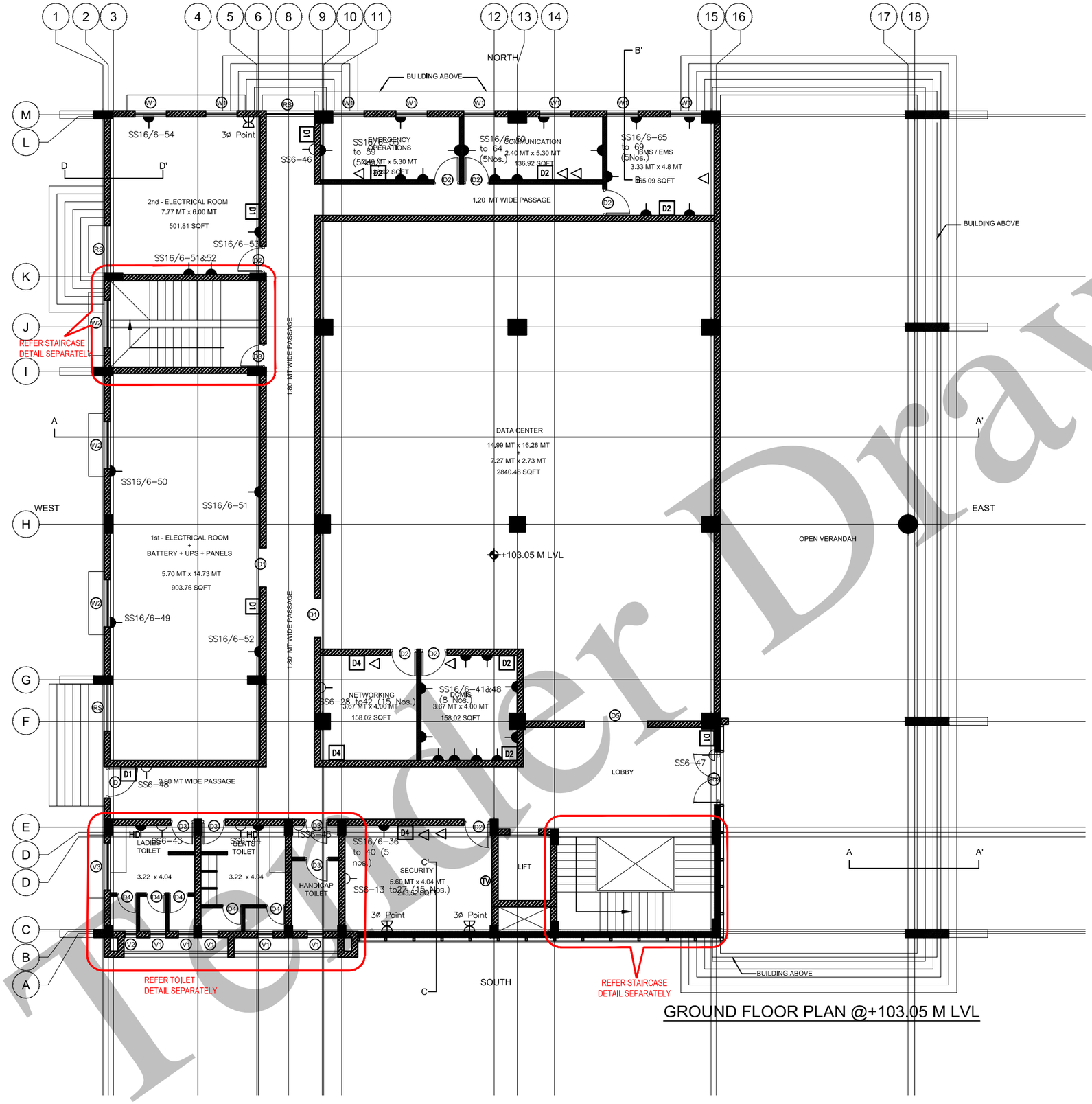
1). The LDB/PDB shall be concealed and mounting hieght shall be as per the standards.

Rev. No.	Date	Description	By	Approved
		Revisions		

Do not Scale

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_Panel Layout_First Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: H. Lele	
		Checked: H. Lele	
		Approved: SK	
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–PANEL–LAY–01	Sheet: 2 of 2
			Size: A2
			Rev.–01



GROUND FLOOR PLAN @+103.05 M LVL

Legends :

Sr. No.	Symbol	Description
1.0		6/16A SWITCH SOCKET OUTLET
2.0		6A SOCKET WITH SWITCH OUTLET
3.0	D1	1NOS DATA POINT
4.0	D2	2NOS DATA POINT
5.0	D3	3NOS DATA POINT
6.0	D4	4NOS DATA POINT
7.0		TELEPHONE OUTLET
8.0	HD	HAND DRYER
9.0	TV	TELEVISION OUTLET
10.0		32A 3ph SOCKET OUTLET

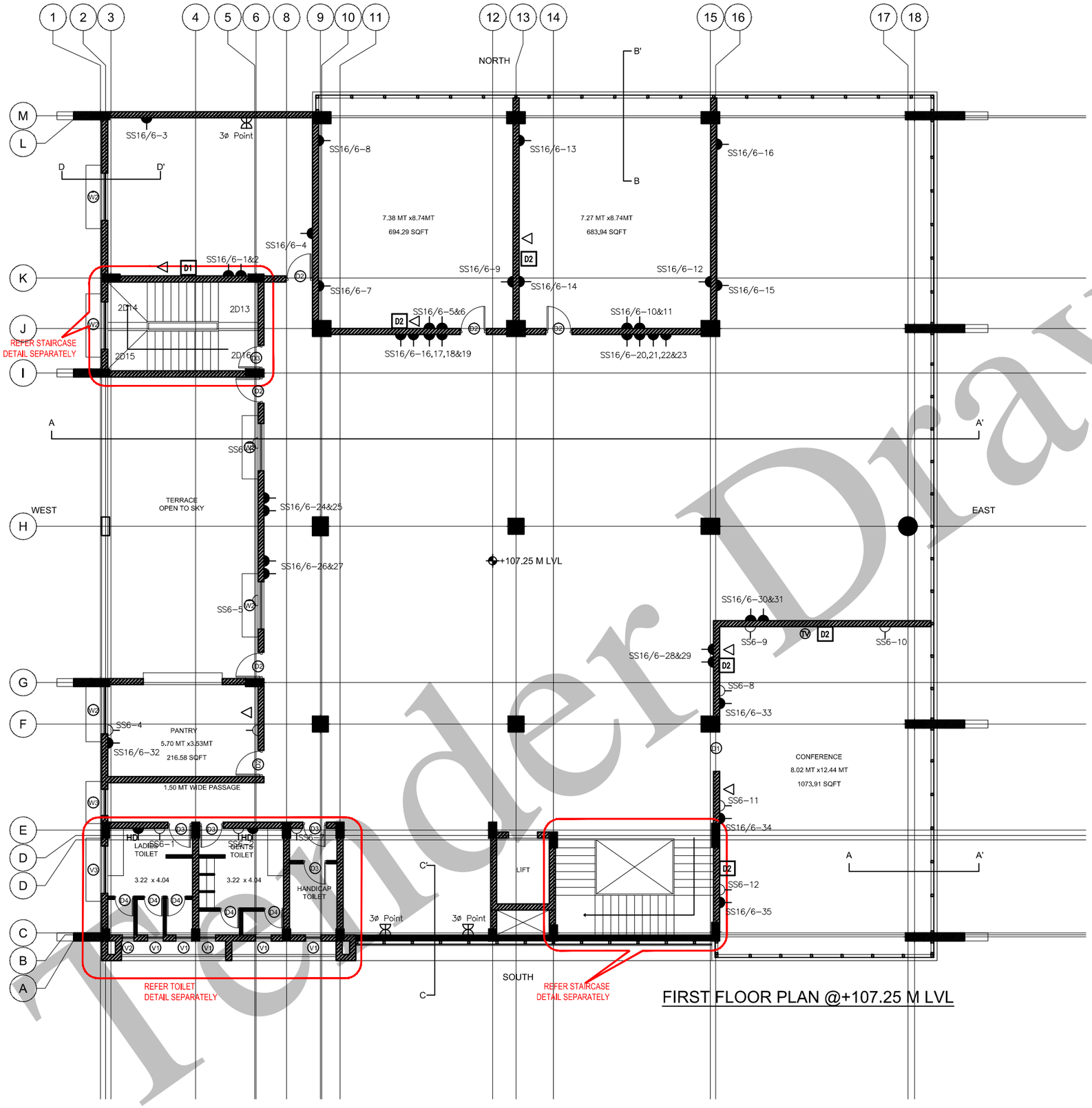
Notes :

1. The quantity shown in each room is tentative and subjected to change during final drawings.
2. Mounting heights of sockets will be confirmed in final execution drawing.
3. This drawing is conceptual only and issued for better understanding of scope of work.

Rev. No.	Date	Description	By	Approved
		Revisions		
		Do not Scale		

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_Power Socket_Ground Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: KD Checked: KD Approved: SK	
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–PS–LAY–01	Sheet: 1 of 3
			Size: A2 Rev.–0



FIRST FLOOR PLAN @+107.25 M LVL

Legends :

Sr. No.	Symbol	Description
1.0		6/16A SWITCH SOCKET OUTLET
2.0		6A SOCKET WITH SWITCH OUTLET
3.0	D1	1NOS DATA POINT
4.0	D2	2NOS DATA POINT
5.0	D3	3NOS DATA POINT
6.0	D4	4NOS DATA POINT
7.0		TELEPHONE OUTLET
8.0	HD	HAND DRYER
9.0	TV	TELEVISION OUTLET
10.0		32A 3ph SOCKET OUTLET

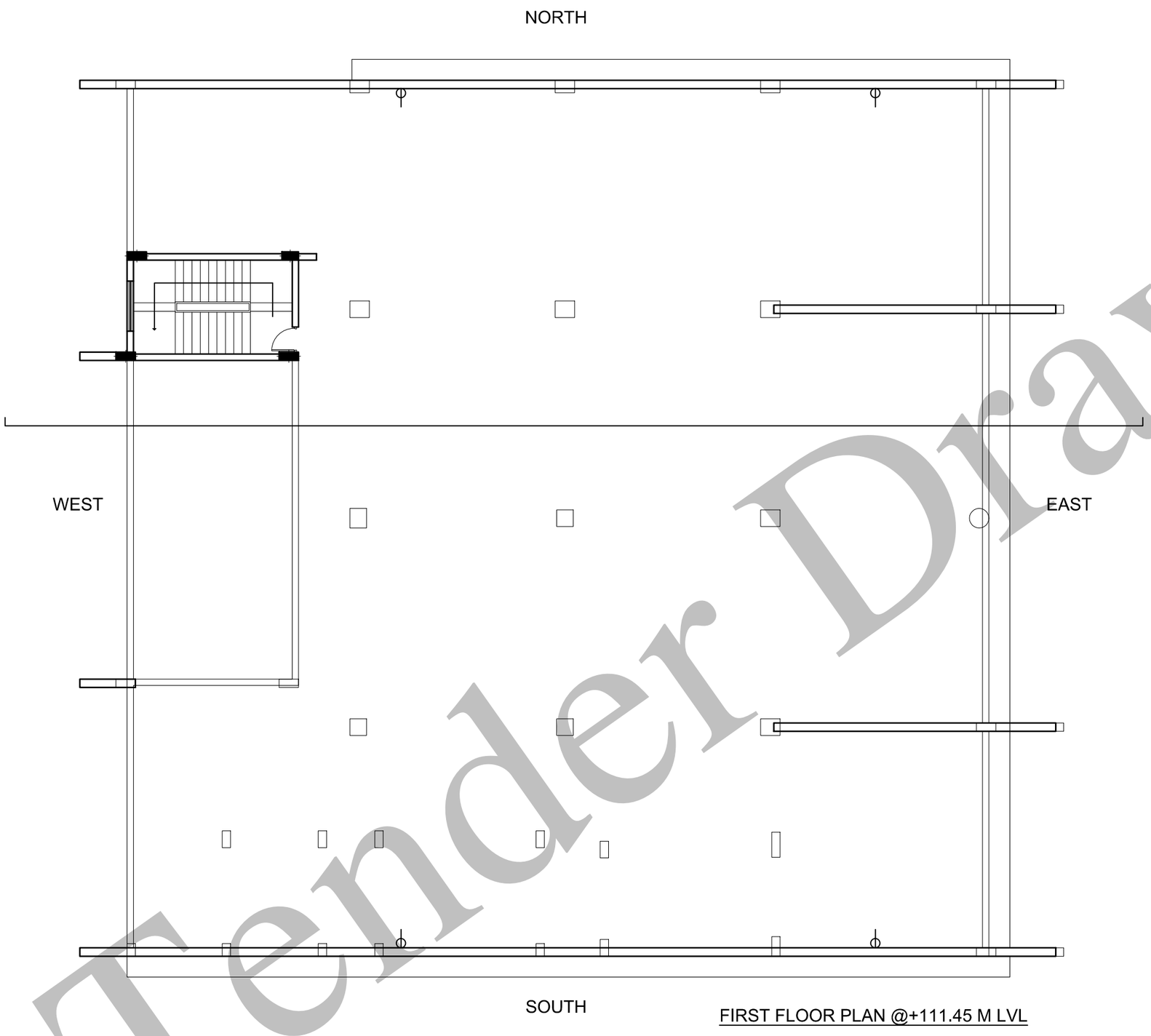
Notes :

1. The quantity shown in each room is tentative and subjected to change during final drawings.
2. Mounting heights of sockets will be confirmed in final execution drawing.
3. This drawing is conceptual only and issued for better understanding of scope of work.

Rev. No.	Date	Description	By	Approved
		Revisions		
		Do not Scale		

VELOCITY ENGINEERING
INDORE

Title: IITI-HUB_Power Socket Layout_First Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn	KD
		Checked	KD
		Approved	SK
Date: 11.04.16	Scale: NTS	Drg. No.: DI-IITI-HUB-PS-LAY-01	Sheet: 2 of 3
			Size: A2
			Rev.-0



FIRST FLOOR PLAN @+111.45 M LVL

Legends :

Sr. No.	Symbol	Description
1.0	⊖	16A SWITCH SOCKET WEATHER PROOF (IP-65)

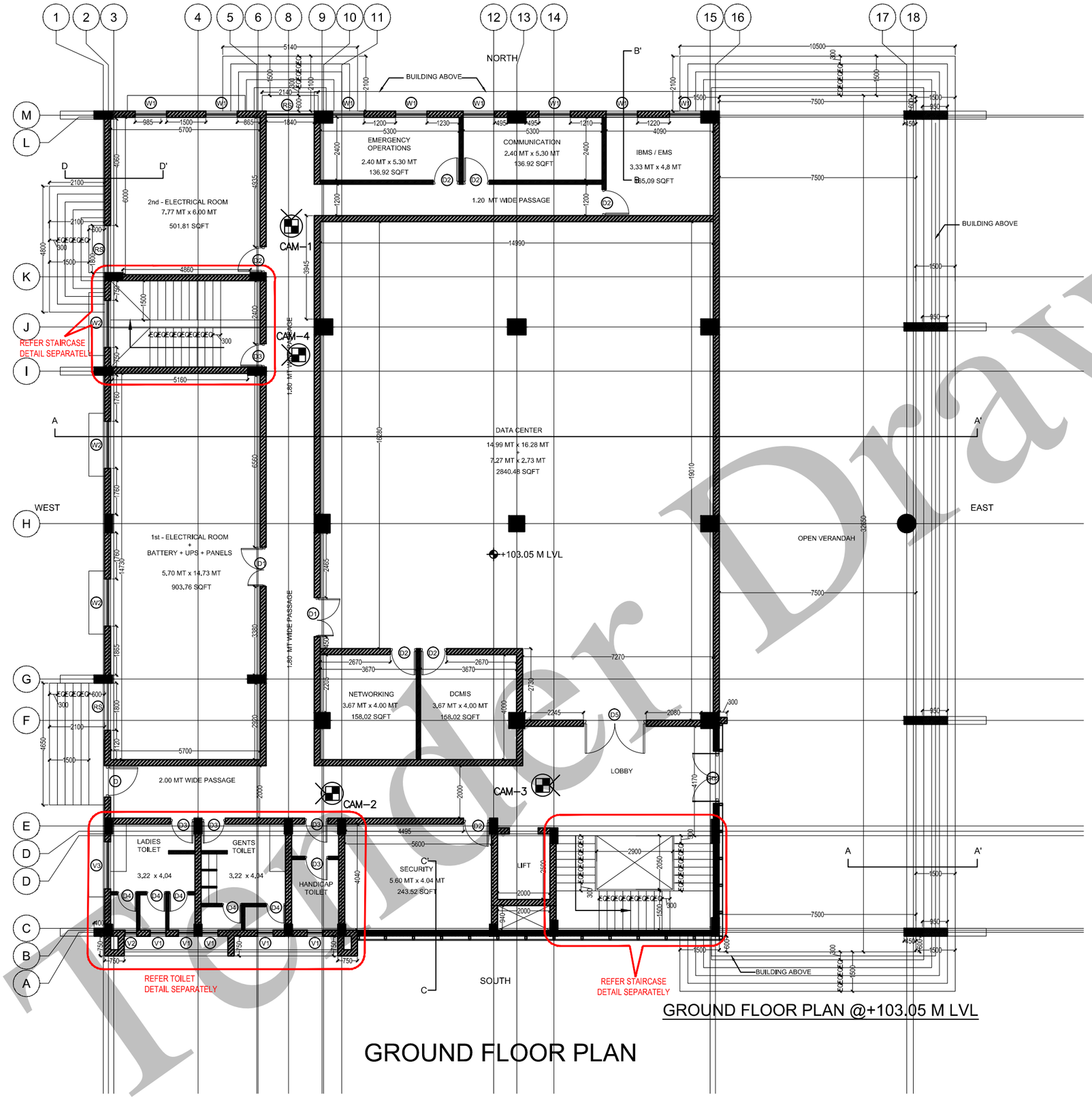
Notes :

1. The quantity shown in each room is tentative and subjected to change during final drawings.
2. Mounting heights of sockets will be confirmed in final execution drawing.
3. This drawing is conceptual only and issued for better understanding of scope of work.

Rev. No.	Date	Description	By	Approved
		Revisions		
		Do not Scale		

VELOCITY ENGINEERING
INDORE

Title: IITI-HUB_Power Socket Layout_Terrace Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn	KD
		Checked	KD
		Approved	SK
Date: 11.04.16	Scale: NTS	Drg. No.: DI-IITI-HUB-PS-LAY-01	Sheet: 3 of 3
			Size: A2
			Rev.-0



GROUND FLOOR PLAN @+103.05 M LVL

GROUND FLOOR PLAN

Legends :

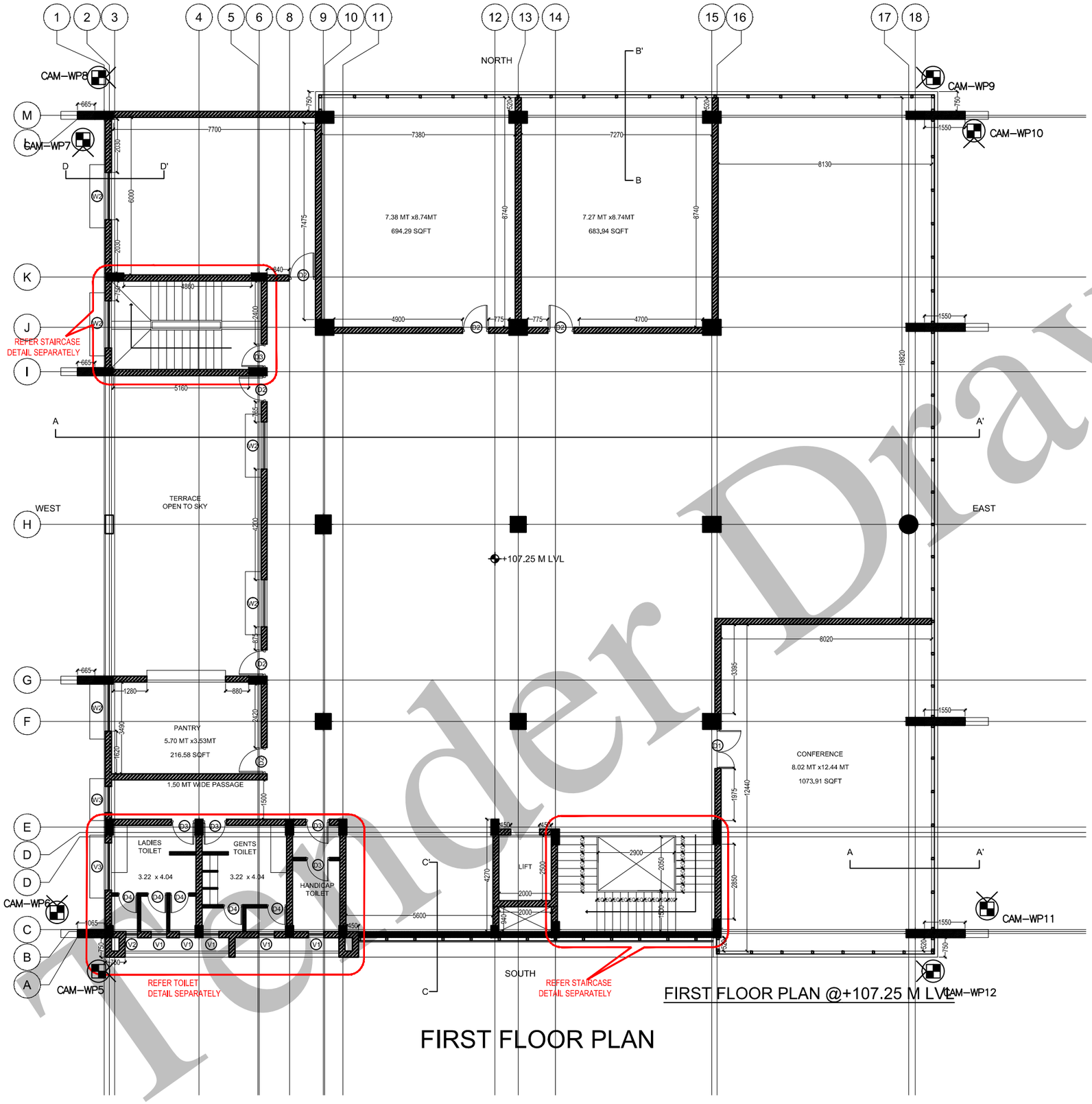
Sr. No.	Symbol	Description	Qty.
1.	CAM–*	Ceiling mounted Dome Camera	4
2.	CAM–WP*	Ceiling mounted Dome Camera (wether proof)	8
3.	DVR	16 Channel Digital Video Recorder	1
4.	CCTVPS	Power supply for CCTV	1

Rev. No.	Date	Description	By	Approved
		Revisions		

Do not Scale

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_CCTV Layout_Ground Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn	KD
		Checked	KD
		Approved	SK
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–CCTV–LAY–01	Sheet: 1 of 2
			Size A2
			Rev.–0



FIRST FLOOR PLAN

FIRST FLOOR PLAN @+107.25 M LVL

Legends :

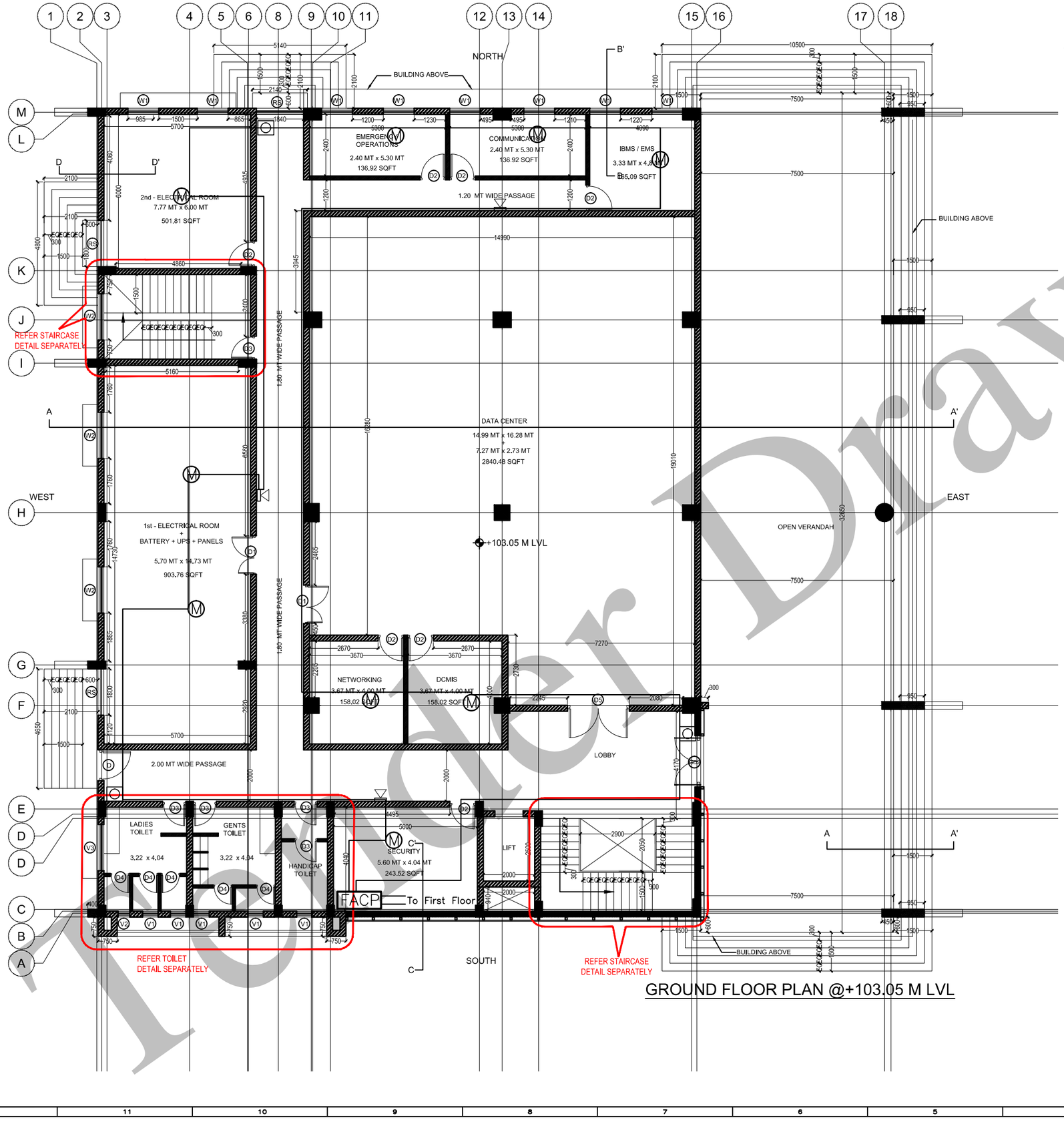
Sr. No.	Symbol	Description	Qty.
1.	CAM–*	Ceiling mounted Dome Camera	4
2.	CAM–WP*	Ceiling mounted Dome Camera (wether proof)	8
3.	DVR	16 Channel Digital Video Recorder	1
4.	CCTVPS	Power supply for CCTV	1

Rev. No.	Date	Description	By	Approved
		Revisions		

Do not Scale

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_CCTV Layout_Ground Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn	KD
		Checked	KD
		Approved	SK
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–CCTV–LAY–01	Sheet: 2 of 2
			Size: A2
			Rev.–0



GROUND FLOOR PLAN @+103.05 M LVL

Table-1 : Area wise Tentative BOQ of FPAD devices (To be referred for reference only) :

Sr. No.	Description	Length (Approx. in mtr.) [X direction]	Width (Approx. in mtr.) [Y direction]	Area (Approx. in Sq. mtr.)	MCD (M)	MCP	Hooter
1.	Ground Floor :						
1.1	1st Electrical Room	6	5.7	34.2	1	–	–
1.3	Em. Operations	2	5.3	10.6	1	–	–
1.4	Communication room	2.4	5.3	12.72	1	–	–
1.5	IBMS Room	3.33	4.8	15.984	1	–	–
1.6	DCMIS Room	3.67	4	14.68	1	–	–
1.6	Networking Room	3.67	4	14.68	1	–	–
1.6	Security Room	4	5.6	22.4	1	–	–
1.7	Main Entry–1	–	–	–	–	1	–
1.8	Main Entry–2	–	–	–	–	1	–
1.9	Main Entry–3	–	–	–	–	1	–
1.10	Passage (Near IBMS)	–	–	–	–	–	1
1.11	Passage (Near Security)	–	–	–	–	–	1
1.12	Passage (Near El. Room–2)	–	–	–	–	–	1
2.	First Floor :						
2.1	Electrical Storage	7.77	6	46.62	1	–	–
2.2	IT Storage	7.27	8.89	64.6	1	–	–
2.3	Operations	7.27	8.89	64.6	1	–	–
2.4	Conference	8.02	12.59	100.9	2	–	–
2.5	Hall	–	–	500	7	–	2
2.6	Stair Case	–	–	–	–	1	–
2.7	Stair Case	–	–	–	–	1	–

Notes :

1). The FACP system shall be addressable type. All sensors and MCPs shall be addressable type.
2). Addressable Output Module shall be provided for each hooter.
3). The Cable shall be 2CX1.5 Sq.MM PVC FRLS.
4). The smoke sensors are consdered as 1 per 80 M. Sq as per NFPA–72.
5). Location of FACP shall be security room at ground floor
6). The locations of MSD, HD, are shown is indicative. The actual locations of same may be changed as per detail engineering by system designer.

Notes & highlight on the drawing :

1). This Layout drawing is intended to enable the bidder to submit a detailed techno–commercial offer for Design, Engineering & supply of **Fire detection and protection system** for new proposed HUB building for IIT, INDORE.
b). The design basis & calculation shall also be submitted along with offer.

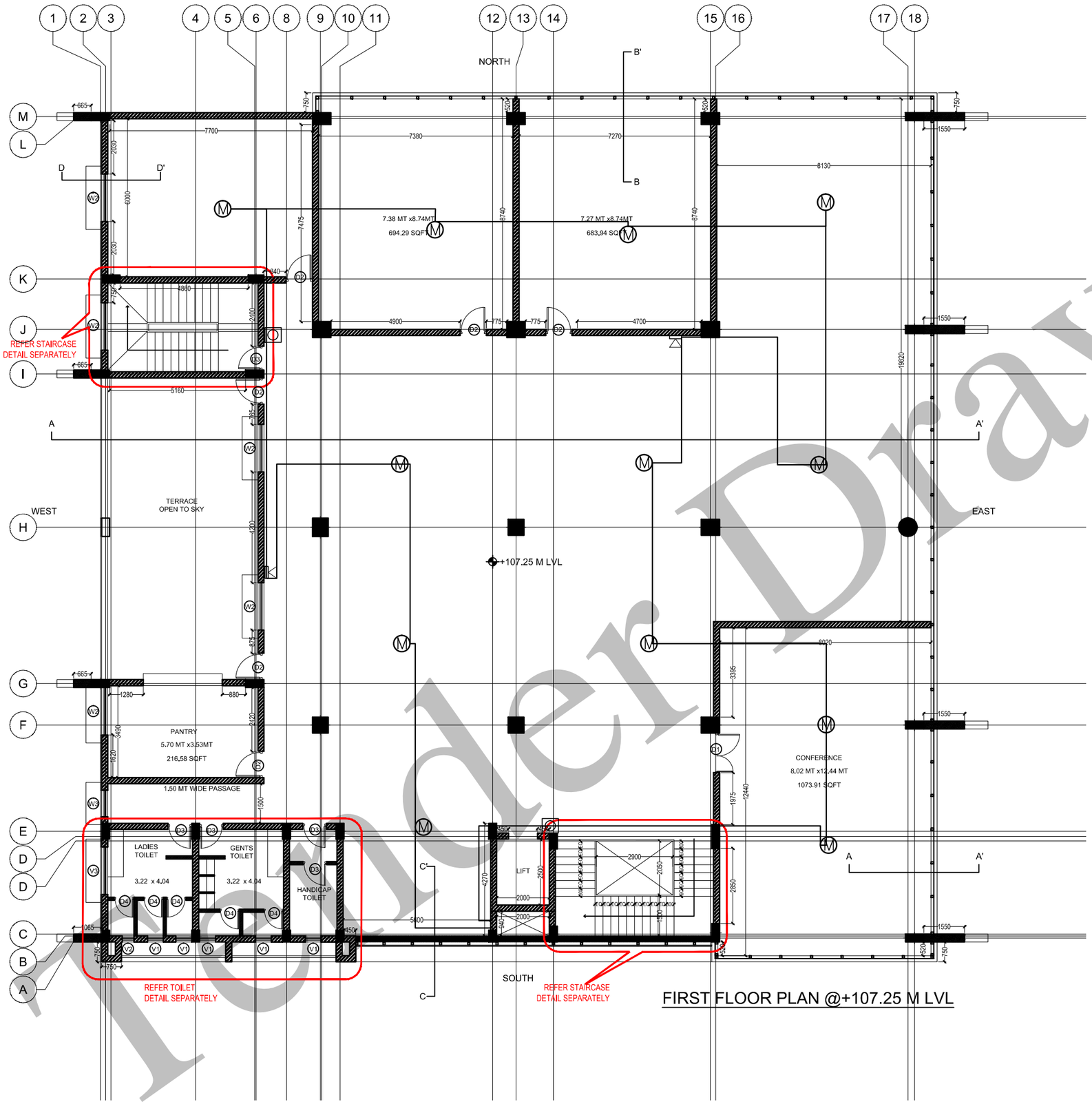
c). For bidders easy identification of the MSD, HD, Hooter, MCP etc. are shown indicatively. The bidder shall submit their design matching with requirements.

2). Above layout drawing to be treated as part of the tender document.

Rev. No.	Date	Description	By	Approved
		Revisions		
		Do not Scale		

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_Fire Alarm_Ground Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn: KD Checked: KD Approved: SK	
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–FAS–LAY–01	Sheet: 1 of 2 Size: A2 Rev.–0



FIRST FLOOR PLAN @+107.25 M LVL

Table-1 : Area wise Tentative BOQ of FPAD devices (To be referred for reference only) :

Sr. No.	Description	Length (Approx. in mtr.) [X direction]	Width (Approx. in mtr.) [Y direction]	Area (Approx. in Sq. mtr.)	MCD (M)	MCP	Hooter
1.	Ground Floor :						
1.1	1st Electrical Room	6	5.7	34.2	1	–	–
1.3	Em. Operations	2	5.3	10.6	1	–	–
1.4	Communication room	2.4	5.3	12.72	1	–	–
1.5	IBMS Room	3.33	4.8	15.984	1	–	–
1.6	DCMIS Room	3.67	4	14.68	1	–	–
1.6	Networking Room	3.67	4	14.68	1	–	–
1.6	Security Room	4	5.6	22.4	1	–	–
1.7	Main Entry–1	–	–	–	–	1	–
1.8	Main Entry–2	–	–	–	–	1	–
1.9	Main Entry–3	–	–	–	–	1	–
1.10	Passage (Near IBMS)	–	–	–	–	–	1
1.11	Passage (Near Security)	–	–	–	–	–	1
1.12	Passage (Near El. Room–2)	–	–	–	–	–	1
2.	First Floor :						
2.1	Electrical Storage	7.77	6	46.62	1	–	–
2.2	IT Storage	7.27	8.89	64.6	1	–	–
2.3	Operations	7.27	8.89	64.6	1	–	–
2.4	Conference	8.02	12.59	100.9	2	–	–
2.5	Hall	–	–	500	7	–	2
2.6	Stair Case	–	–	–	–	1	–
2.7	Stair Case	–	–	–	–	1	–

Notes :

1). The FACP system shall be addressable type. All sensors and MCPs shall be addressable type.
2). Addressable Output Module shall be provided for each hooter.
3). The Cable shall be 2CX1.5 Sq.MM PVC FRLS.
4). The smoke sensors are consdered as 1 per 80 M. Sq as per NFPA–72.
5). Location of FACP shall be security room at ground floor
6). The locations of MSD, HD, are shown is indicative. The actual locations of same may be changed as per detail engineering by system designer.

Notes & highlight on the drawing :

1). This Layout drawing is intended to enable the bidder to submit a detailed techno–commercial offer for Design, Engineering & supply of **Fire detection and protection system** for new proposed HUB building for IIT, INDORE.
b). The design basis & calculation shall also be submitted along with offer.

c). For bidders easy identification of the MSD, HD, Hooter, MCP etc. are shown indicatively. The bidder shall submit their design matching with requirements.

2). Above layout drawing to be treated as part of the tender document.

Rev. No.	Date	Description	By	Approved
		Revisions		
		Do not Scale		

VELOCITY ENGINEERING
INDORE

Title: IITI–HUB_Fire Alarm_First Floor		Status: Preliminary	Purpose: Approval
Client: Design Ideas	Project: IITI HUB Building	Drawn	KD
		Checked	KD
		Approved	SK
Date: 11.04.16	Scale: NTS	Drg. No.: DI–IITI–HUB–FAS–LAY–01	Sheet: 2 of 2
			Size: A2
			Rev.–0