



TENDER DOCUMENT

FOR

DESIGN, FABRICATION, SUPPLY &

CONSTRUCTION OF

PRE-ENGINEERED BUILDING (PEB) / PORTA

STRUCTURE

INFRONT OF CENTRAL LIBRARY BUILDING NEAR

GATE NO.-05

JAMIA HAMDARD

HAMDARD NAGAR

NEW DELHI –110062

IMPORTANT

THE CONTRACTOR SHOULD SATISFY HIMSELF THAT NO PAPER OR DOCUMENT FROM THIS SEALED FILE IS MISSING WHILE SUBMITTING THIS TENDER

TENDER ISSUED TO _____

ISSUING DATE _____

SIGNATURE OF ISSUING OFFICER: _____

LAST DATE OF RECEIVING _____

DATE OF OPENING _____

SGNATURE OF THE EXECUTIVE ENGINEER _____

Seal & Signature of the Tenderer



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JAMIA HAMDARD
(DEEMED TO BE UNIVERSITY)
HAMDARD NAGAR, NEW DELHI-110062

NOTICE INVITING TENDER

Ref.No. JH/PEB PORTA /01/2026

Date: 19.03.2026

Jamia Hamdard, New Delhi invites sealed items rate Tenders in **Three-Bid System** (PQ + Technical + Financial) from reputed contractors registered with CPWD, DDA and other Govt. Dept only for the below work. Tender Documents are attached herewith. also available at website / portal last date of submission of the Tender is **10th April 2026 up to 3.00 PM**. The Parties/agencies may submit the tender after satisfying themselves eligible for the work as per Terms & Conditions of tender.

NAME OF WORK:	Design, fabrication Supply & Construction of Pre Engineered Porta Structure Infront of central library building near Gate No.. 05
ESTIMATED COST:	Rs. 9,00,00,000.00/- inclusive of GST
EARNEST MONEY:	Rs. 18,00,000.00/-
TENDER COST:	Rs. 10,000/- (Non-Refundable)
TIME PERIOD:	4.5 Months (135 Days from the Day of Award)
PRE-BID MEETING:	<u>2nd April 2026 at 11 AM in office of Executive Engineer</u>

The Tender dully filled should be dropped in the Tender Box kept in purchase section on or before 10th April 2026 **upto 3.00 PM** along with demand draft of earnest money & Tender fee in sealed envelope clearly specifying the name of work. The D.Ds shall be in favour of Jamia Hamdard payable at New Delhi. The PQ/Eligibility Criteria bid shall be opened on **10th April 2026 at 3.30 PM** by the tender committee in presence of available interested parties, The Qualified parties shall be asked to present a Design and execution methodology basis their understanding of the project with the provided documents. The Qualified Parties on the basis of this technical presentation shall be invited for financial Bid Date & time for opening of financial bid will be intimated later on to technically qualified bidders. Jamia Hamdard reserves the right to reject any or all tenders or split the tenders without assigning any reason.

Registrar

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INSTRUCTRIONS TO BIDDER / TENDER CONDITIONS

Jamia Hamdard invites tenders from **eligible and experienced bidders** for the **design, engineering, fabrication, supply, transportation, erection and commissioning of Pre-Engineered Building (PEB) structure along with associated civil, structural and architectural works** for the proposed facility within the Jamia Hamdard campus.

The scope of work broadly includes **design and engineering of PEB structure, fabrication of structural steel components, supply and erection of structural framework, roofing and wall cladding systems, foundations, anchor bolts, gutters and rainwater down-take pipes, drainage systems, finishing works & MEPF & other allied works required for the complete and functional execution of the project** in accordance with approved drawings, technical specifications and tender conditions.

Bidder's Qualifying Requirement (QR):

1. The average annual financial turnover of the bidder during the last three years ending 31st March of the previous financial year should be at least 50% estimated cost of the project.
2. Bidder should have successfully completed / executed similar work (s) during the last seven years ending last day of month previous to the one in which applications were invited, either of the following:
 - a) In case of single similar contract completed / executed value not less than 80% of the estimated cost.

OR
 - b) In case of two similar contracts completed / executed value not less than 60% of the estimated cost.

OR
 - c) In case of three similar contracts completed / executed value not less than 40% of the estimated cost.
3. Bidder should have Permanent Account Number (PAN), GST, PF & ESI as well as all other statutory registration requirements to fulfil the work requirements.
4. Bidder should have a Solvency of as per CPWD **4 Cr.**

Definition of Similar Work

Similar works shall mean construction of Pre-Engineered Buildings (PEB) comprising fabrication, supply and erection of structural steel components such as portal frames, columns, rafters, purlins, girts, bracings, roofing and wall cladding systems, along with associated civil works including foundations, pedestals, plinth and other allied works, executed for institutional buildings, industrial buildings, warehouses, commercial buildings, healthcare facilities or similar infrastructure projects.

The bidder should have successfully completed similar works during the last 7 (seven) years ending previous day of last date of submission of bids, as under:

(A) Composite Works:

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wherein each work includes both PEB and associated civil components under a single contract.

OR

(B) Separate Works:

The bidder should have completed PEB works and civil works separately, meeting the following criteria:

(i) PEB Works:

Fabrication, supply and erection of PEB/structural steel buildings including roofing and wall cladding.

(ii) Civil Works:

Execution of RCC/structural works such as foundations, pedestals, plinth etc.

Both (i) and (ii) shall individually satisfy the eligibility criteria of:

- One work of 80%, OR
- Two works of 60%, OR
- Three works of 40% of the estimated cost.

Notes:

1. The value of completed works shall be brought to current costing level by enhancing the actual value @7% per annum from date of completion to last date of submission of bid.

2. Similar works shall not include isolated activities such as only fabrication, only supply, only roofing/cladding, or only finishing works.

3. The works should be completed works and supported with completion certificates indicating clearly the scope, value and date of completion.

4. In case of composite works, the bidder shall demonstrate execution of both PEB and civil components under the same agreement.

5. Experience of works executed as sub-contractor or in joint venture shall not be considered.

6. The decision of the Engineer-in-Charge regarding similarity and eligibility shall be final and binding.

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Experience Certification

- The past experience of similar nature of work shall be supported by **completion certificates issued by the client organization**, clearly indicating the **nature, scope and value of the work executed**.
- In case the work experience is from the **private sector**, the completion certificate shall be supported with **copies of Letter of Award / Work Order and corresponding TDS certificates**.
The **value of the executed work shall be considered based on the value reflected in the TDS certificates**.

Declaration of PEB Manufacturer / Executing Agency

The bidder shall clearly indicate the **name and details of the Pre-Engineered Building (PEB) manufacturer / fabrication agency** with whom the PEB structure shall be designed, engineered, fabricated and supplied for the project. The same shall be referred from the approved list of marks

The bidder shall submit the following details of the proposed PEB manufacturer as part of the **technical bid**:

- Name and registered address of the PEB manufacturer
- Details of **manufacturing facilities and fabrication infrastructure**
- Details of **installed fabrication capacity**, clearly indicating the **monthly fabrication capacity of structural steel (in MT per month)**
- Experience in design, fabrication and execution of similar PEB projects
- List of major PEB / structural steel projects executed during the last **five years**
- Technical capability including availability of **in-house design and engineering facilities**
- Details of available infrastructure such as **CNC cutting machines, welding facilities, shot blasting and painting facilities, and quality control systems**

The proposed **PEB manufacturer shall have a minimum fabrication capacity of not less than 300 MT of structural steel per month**, supported by documentary evidence of manufacturing facilities and equipment.

The bidder shall also demonstrate that the proposed PEB manufacturer has **sufficient fabrication and supply capacity to meet the project requirements within the stipulated project timeline of 135 days**.

In case the bidder is **not the manufacturer**, the bidder shall submit a **letter of association / authorization from the proposed PEB manufacturer** confirming their participation in the project.

The **PEB manufacturer proposed by the bidder shall not be changed during the execution of the project without prior written approval of the Engineer In-charge / PMC**.

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Preference Criteria

Agencies having prior experience in **execution of PEB or structural steel buildings within operational institutional / educational campuses or functioning facilities** will be given preference during technical evaluation.

BIDDERS ARE REQUESTED TO CAREFULLY READ THE FOLLOWING AND COMPLY:

1. These instructions are over and above the instructions contained in the enclosed set of tender documents.
 2. The cost of tender document may be deposited in the form of Bank's Cheque/ Demand draft/ in favour of **Jamia Hamdard**.
 3. Bidders must fill the letter of undertaking and Declaration Programme complete in all respect.
 4. **No sub-letting of the work is allowed. Work under this contract, either full or any part of the contract shall not be assigned or sub-let without prior written permission and information of Jamia Hamdard.**
 5. **Bidders must quote their rates including GST in typed format.**
 6. Bidder must sign preferably **with blue ink** on each and every page of the enclosed tender documents and submit the same in sealed envelope super-scribing the NIT No., Name of Work, Bid Opening Date. The offer should be in sealed envelope and preferably be sent by Registered post / speed post/ by Hand. Intending bidders are advised to post their offers well in time so as to reach us before bid due date and time. Offers sent through courier / by hand shall not be accepted if presented after the due date and time of submission of bids.
 7. THE ENQUIRY NO., BID DUE DATE AND DETAILS OF EARNEST MONEY DEPOSIT (EMD) SHOULD BE SUPERSCRIBED ON THE ENVELOP CONTAINING EMD.
 8. The bidder shall be required to fully comply with all statutory provisions as per law respects of its employees / workman engaged by them for this work.
- 9. Documents to be submitted along with Technical Bids**
- a. Copies of valid registration Certificate.
 - b. Copies of completion and Performance Certificates (duly attested) for similar scope of works issued by the officer of the client/Dept. of the rank of Executive Engineer/equivalent or the Head of the Institution will have to be furnished along with the application. The completion certificate must clearly indicate the following:

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- The date of completion of work with cost of completed work with letters of successful completion. Nature and scope of work, Time period of completion (attach client's list).
 - The firms are advised to enclose attested copies of valid PAN, PF, ESI, GSTN & Labor CESS .
- c. Earnest Money, **Rs. 18,00,000/-** to be deposit in the form of DD in favour of Jamia Hamdard.
- d. Tender Cost, Rs. 10,000 (non-refundable) in the form of DD in favour of Jamia Hamdard.
- e. Company's financial performance documents (Audited balance sheet, and profit and loss statement.
- f. Copies of work orders for similar nature of work as specified above.
- g. Copies of IT return acknowledgement for last three financial years.
- h. All documents submitted by the bidder should be self-attested along with stamp.

10.SUBMISSION OF BID:

The tender will be submitted in three envelopes :

1. Submission of Tender: Tenders should be submitted in three Parts i.e. "PQ/ Eligibility Criteria Bid"; "Technical bid" (Part-B) and "Price bid" (Part-C) in three separate sealed envelopes. All these parts should be further put in a single sealed envelope super-scribing NIT No. & name of work, due date for opening, bidder's name & address. The tender duly filled in may be sent to above mentioned address either by post or hand delivered in the tender box kept in the Purchase Section. It should not be handed over to any employee of the Jamia Hamdard. No tender shall be accepted later than the time schedule specified in NIT.

Any clarifications/amendments/corrigenda etc., to NIT before last date of submission of bid will only be available on our website:

www.jamiahamdard.edu. Therefore, bidders are advised to keep visiting our website.

- a. **PQ/ Eligibility Criteria Bid (Part-A):** shall contain all documents as mentioned above.
- b. **Technical Bid (Part-B):** Parties Shall compile a Design presentation consisting of the following
 - Company Profile & Associate PEB Vendor profile

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- Presentation explaining the Execution & its challenges, PEB execution & its chronology, Interiors Execution process and Timeline bifurcation along with initial PEB Proposals.
- A complete Gent/PERT Chart for the proposed project execution

c. Price Bid (Part-C):

In this bid, the bidder is required to quote his item rates in the BOQ attached in accordance with the scope of work, terms & conditions & technical specifications enclosed. The rates/price quoted by contractor should be all inclusive i.e. should include all material cost, labour, services, plant/machinery/tools & tackles, ladder & scaffolding, freight, Insurance, transport/cartage of materials/labour and all other expenses not specifically mentioned but reasonably implied. Nothing over and above these rates shall be payable to contractor. Further nothing extra in rates will be considered for any variations in tender quantities or due to any site difficulties. It is mandatory for bidder to quote all items rate as asked for in the BOQ/ PRICE schedule. Failure in not filling some item rates will lead to rejection of tender. The bidders should quote unconditional rates, in typed format.

Jamia Hamdard reserves the rights to increase or decrease the quantum of work during the execution of work and to accept/reject full/part proposals without assigning any reason thereof.

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APPLICATION FROM TENDERER
(Forwarding letter)

From:

M/s _____

To

The Registrar
Jamia Hamdard
Hamdard Nagar
New Delhi – 110062

Subject: Tender for Design, Fabrication, Supply and Erection of Pre-Engineered Building (PEB) Structure and Associated Works at Jamia Hamdard Campus

Dear Sir,

With reference to the Notice Inviting Tender issued by Jamia Hamdard for the above-mentioned work, **I/We hereby submit our tender for the design, engineering, fabrication, supply, transportation, erection and completion of the Pre-Engineered Building (PEB) structure along with associated civil and allied works** in accordance with the drawings, specifications, schedule of quantities and conditions of contract for the amount quoted in the Financial Bid submitted by us.

I/We confirm that **I/We have carefully examined the tender documents, drawings, specifications, conditions of contract and all other relevant documents** relating to the work. I/We have also **visited the site and satisfied myself/ourselves regarding the location, site conditions and all other factors that may affect the execution of the work.** I/We fully understand that **the work is required to be completed within the stipulated time period, and I/We agree that time shall be the essence of the contract.**

I/We enclose herewith the **Earnest Money Deposit (EMD)** amounting to **Rs. _____ (Rupees _____ only)** in the form specified in the tender document, drawn in favour of **Jamia Hamdard, Hamdard Nagar, New Delhi – 110062.**

I/We hereby agree to **abide by and fulfil all the terms and conditions of the tender, Notice Inviting Tender (NIT), technical specifications and conditions of contract.** In the event of my/our failure to comply with any of the tender conditions after submission of the bid or after award of the contract, the Employer shall have the right to **forfeit the Earnest Money Deposit and take such other actions as deemed appropriate** in accordance with the tender conditions. I/We further agree that the **Executive Engineer, Jamia Hamdard, or his authorized representative,** shall be at liberty to **forfeit the Earnest Money Deposit without prejudice to**

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any other rights or remedies available, if I/We fail to commence the work within the stipulated period after the award of the contract.

Otherwise, the said **Earnest Money Deposit may be retained towards the Security Deposit** as specified in the conditions of contract.

Name of Contractor / Firm: _____

Name of Partner(s) / Authorized Signatory: _____

Signature of Authorized Signatory with Seal: _____

Date: _____

Address: _____

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CHECKLIST

To be submitted along with bid

The tenderers are requested to ensure the submission of the essential documents to avoid disqualification of the bid. However, the check list is not exhaustive and the tenderer are requested to go through to NIT & related documents carefully and completely for fulfilments of tenderers requirement.

S.No.	Enclosures	Submitted
1.	Copies of valid registration certificate	
2.	Cost of tender documents (non-refundable) in form of DD in favour of Jamia Hamdard	
3.	EMD in form of DD in favour of Jamia Hamdard.	
4.	List of Similar Work orders	
5.	Average annual turn-over of last three financial years, with certificate from practicing Chartered Accountant.	
6.	Ensure signature with stamp on all pages of tender documents.	
7.	Bank account details along with Bankers Certificate for credit worthiness not less than 4 Cr.	
8.	Copies of valid PAN, PF, ESI, GSTN, WCT if applicable.	
9.	Complete list of machinery and equipment and details of technical manpower.	
10.	Copies of completion and performance certificates (duly attested) for similar scope of works.	
11.	Copies of IT return acknowledgement for last three financial years.	
12.	Certificate by manufacturers of approved brands as given in list of approved makes/schedule of quantities with their approved applicator/agency.	
13.	E-mail address	
14.	Address for communication	
15.	Contact details such as phone number, mobile no., landline no.	
16.	Complete Document Soft Copy In Pen Drive in each folder	

Signature of Tenderer

Dated the

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BID OPENING:

Firstly, First Envelope (PQ/Eligibility Criteria Bid) containing all pre-qualification documents tender fee and EMD as stated above will be opened and duly scrutinized by PMC/Engineer In-charge for their eligibility. Only bidders who fulfil the PQ/Eligibility Criteria Bid requirements, shall be called upon for the Second Bid i.e. Technical Bid, basis the Technical Bid their Third Envelope (Price Bid) will be opened.

In case of acceptance of the bids, the successful bidder must enter into an agreement as Jamia Hamdard Proforma on NON-JUDICIAL STAMP PAPER of Rs.100/- in DUPLICATE.

- a) Rates shall be quoted both in figures and in words in clear legible writing. No cutting / over writing is allowed. All scoring and cancellation should be counter signed in full by the tenderer. In case of illegibility the interpretation of the Tender Committee shall be final.
 - b) The quoted price must be written in both figures and words. Alteration if any, should be made clearly by crossing the whole entered rate and last corrections should be attested by the tenderer's with their full signature and rubber stamp. In no case there should be overwriting and all tenders with such overwriting shall be liable for rejection.
 - c) The tenderers are required to quote their rates **INCLUDING GST**.
 - d) **Prices quoted shall not be subject to ESCALATION till Project Completion.**
11. Offers shall be accompanied with earnest money deposit (EMD) of requisite value as specified in a separate envelope failing which offer are liable for rejection.

In consideration of the owner opening and considering the tender for purpose of award of contract, the Tenderer shall keep his tender valid for a period bid validity from the date of opening of tender, during that period the tenderer agrees not to vary, or revoke his tender either in whole or in part. If the tenderer varies the price and its term and conditions during the validity period of the offer, then, the owner shall be entitled to forfeit the bid guarantee without any notice or proof of damages etc. The tenderer shall submit tender as required in the bid documents along with 'letter of undertaking' in the Proforma enclosed in the bid documents.

The EMD's of unsuccessful tenderers to be returned after award of the Contract to Successful bidder. No interest will be payable on the said amount.

THE EARNEST MONEY SHALL BE FORFEITED ON THE FOLLOWING GROUNDS: -

- (i) On revocation / modification of tender or;

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- (ii) On refusal to enter into a contract after the work is awarded to a contractor or;
 - (iii) If the work is not commenced after the work is awarded to a contractor.
 - (iv) Refusal to accept the arithmetic correction (s).
 - (v) Submission of false documents.
 - (vi) Increase the rates after opening of tender before the expiry of the validity of the tender.
12. Contractors should ensure renewal / revalidation of Electrical for safe job execution and contractual requirement.
 13. Offer must be strictly as per specification / drawings as spelt out in the enquiry. No Deviations are allowed.
 14. All incidental items not shown or specified but reasonably implied or necessary for successful completion of the work shall be provided by the contractor at his own cost. Decision of the Owner/ Consultant will be final in this regard. However, the contractor shall execute any extra items, if necessary for completion of the work with prior permission of Owner/ Consultant.
 15. All tender papers should be duly signed and stamped on all pages and the proforma supplied should be filled in giving full information and submitted along-with the tender.
 16. Materials to be supplied by the contractor as per scope of work shall be of good quality/ ISI marked and of specified acceptable brand(s) only. It shall require approval of PMC/Engineer In-charge.
 17. Arithmetical errors will be rectified on the following basis:

If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between subtotals and the total price, the unit or subtotal price shall prevail and the total price shall be corrected accordingly. If there is a discrepancy between words and figures, the amount in words will prevail. If the Bidder does not accept such correction of errors, its bid will be rejected and the bid security will be forfeited.
 18. All bidders should be registered with the Regional Provident-Fund Commissioner. They are also required to give categorical, confirmation that they would cover the contract-labourers engaged by them as well as the sub-contractor for the purpose of provident fund benefits. On quarterly basis the necessary documents for having deposited the PF for the workers deployed will be furnished to the PMC/Engineer In-charge.
 19. In compliance with the requirement under the provision on Contract Regulation & Abolition Act., the contractor shall obtain a labour-license. The Labour license shall be submitted to PMC/Engineer In-charge before the commencement of the work/ contract. However, in this regard, decision of PMC/Engineer In-charge shall be final and binding.

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20. The persons below the age of 18 (Eighteen) years and children worker **shall not** be deployed on the work.

21. Abnormally High or Low Rated Items:

(A) If the rates/ prices quoted by the successful bidder for one or more items of the bill of quantities (wherever such rates/ prices have been called for in the bids) are found to be abnormally high or low in relation to the Engineers estimate of the cost of work to be performed under the contract, then Jamia Hamdard shall require the bidder to produce detailed rates/ price analysis for any or all items of the bill of quantities to demonstrate the internal consistency of those rates/price with the construction methods and schedule proposed.

(B) After evaluation of rate / price analysis, Jamia Hamdard shall require that the amount of the performance security be increased at the expense of the successful bidder to a level sufficient to protect the owner against financial loss in the event to default by the contractor under the contract, if award is placed on recommended bidder.

Award value of Contract w.r.t Cost Estimate **Amount of Additional Guarantee**

a) Up to negative (-) 15%

No Add. Guarantee

b) Below negative (-) 15%

An amount equal to the cost difference between estimated cost and award value

The Additional Guarantee is to be released after successful completion of work.

Additional Guarantee shall be submitted only in the form of Demand Draft/Banker cheque in favor of “Jamia Hamdard”. In case L-1 bidder denies to give the Additional performance guarantee, his bid will not be considered and his EMD will be forfeited and he will not be allowed to participate in retender.

22. The contractor shall ensure timely payments to the workers and shall not link the same with receipt of payments from Jamia Hamdard against monthly RAB's. In case of contractor's failure to disburse the wages by 7th day of month, Jamia Hamdard may directly pay the wages, other statutory obligations & charge from the contractor upto 10% along with applicable GST on the amount paid, as overheads. Non-compliance of this clause shall be reflected in the performance of the contractor.

23. Contractor shall comply with all statutory benefits such as EL, Retrenchment, paid national holidays, PF employer's contribution, bonus, medical & safety etc. as per labour act & factories act to the labour deployed under this contract & submit copy of details to PMC/Engineer In-charge.

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24. Contractor will have to follow up the day-to-day work schedule as provided by PMC/Engineer In-charge. The contractor shall keep a competent authorized representative. The representative shall represent the contractor in his absence and all direction given to him shall be binding as if given to the contractor. He shall give daily feed back to the PMC/Engineer In-charge.
25. Bidders should note that printed terms and conditions submitted by the bidders shall not be considered and shall not be considered as a part of contract.
26. Bidders are advised to give fully compliant bid meeting all terms of conditions stipulated in the bidding documents.
27. All bidders shall be required to certify that they would adhere to the fraud prevention policy of Jamia Hamdard and not indulge to fraudulent activities and immediately apprise the organisation of the fraud / suspected fraud as soon as it comes to their notice.
28. Jamia Hamdard can at its sole discretion unilaterally change the quantity / BOQ to the extent of + /-20% on overall contract basis as indicated in the NIT unless otherwise specified. The bidder would be bound to accept these quantities on the same terms & conditions of price and delivery.

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FORM OF AGREEMENT:

ARTICLES OF AGREEMENT made on this _____ day of _____, Two Thousand Twenty Four between **Jamia Hamdard**, incorporated under the relevant Act and having its Head Office at **Hamdard Nagar, New Delhi – 110062** (hereinafter referred to as the “**Employer / Owner**”, which expression shall, unless excluded by or repugnant to the context, include its successors and assigns) of the **ONE PART**.

AND

M/s _____, having its registered office at _____ (hereinafter referred to as the “**Contractor**”, which expression shall, unless excluded by or repugnant to the context, include its successors and permitted assigns) of the **OTHER PART**.

WHEREAS

The Employer intends to undertake the **Design, Engineering, Fabrication, Supply and Erection of Pre-Engineered Building (PEB) Structure along with associated civil works, foundations, roofing and cladding systems, drainage systems and allied works** at the **Jamia Hamdard Campus, Hamdard Nagar, New Delhi** (hereinafter referred to as the “**Project**”).

AND WHEREAS the Employer, in order to effectively carry out the said works, has engaged **M/s Bulten Architecture and Design Consultancy LLP** (hereinafter referred to as the “**PMC / Engineer-in-Charge**”) to prepare plans, drawings and specifications describing the works to be executed for the project; to assist the Employer in inviting tenders; to open tenders received at the office of the Employer; to scrutinize and recommend to the Employer the name(s) of the contractor(s) from whom tenders were received; and to recommend to the Employer the issuance of the work order to the selected contractor.

AND WHEREAS for the purpose of the said project, the Employer invited tenders from experienced, resourceful and bona fide contractors vide **Notice Inviting Tender (NIT No. _____ dated _____)**.

AND WHEREAS the Contractor submitted its Tender along with the Tender Documents containing **General Notes, General Conditions of Contract, Special Conditions, Technical Specifications, Drawings, Schedule of Quantities and other tender documents**, duly signed on each page as a token of acceptance of the same, along with the requisite **Earnest Money Deposit of Rs. _____ (copy enclosed)**.

AND WHEREAS out of the tenders received, the **Tender of the Contractor was found to be most suitable for execution of the project**.

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AND WHEREAS the Employer has accordingly issued the **Work Order / Letter of Award No. _____ dated _____** to the Contractor subject to his furnishing the requisite **Performance Bank Guarantee (copy enclosed)**.

AND WHEREAS the Contractor has accepted the aforesaid Work Order vide his **Letter of Acceptance No. _____ dated _____ (copy enclosed)** and has deposited with the Employer a sum of **Rs. _____**, which together with the **Earnest Money Deposit of Rs. _____** previously deposited amounts to **Rs. _____**, including the **Performance Bank Guarantee equivalent to 3% of the accepted tender value of Rs. _____ (in the form of Bank Guarantee)**.

AND WHEREAS the Employer has prepared the **plans, drawings, specifications and schedule of quantities relating to the project**, which shall be issued to the Contractor for execution of the works at the project site.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS

1. Contract Documents

The following documents shall constitute the **Contract Documents**:

- a) This **Articles of Agreement**
- b) The **Notice Inviting Tender (NIT)** and the Tender submitted by the Contractor including all Tender Documents
- c) All correspondence between **Jamia Hamdard / PMC (M/s Bulten Architecture and Design Consultancy LLP)** and the Contractor from the date of issue of NIT to the date of issuance of the Work Order
- d) **Work Order / Letter of Award No. _____ dated _____**
- e) **Letter of Acceptance of the Work Order by the Contractor**
- f) **General Conditions of Contract (GCC)**
- g) **Special Conditions of Contract (SCC)**
- h) **Technical Specifications and Approved Drawings**
- i) **Schedule of Quantities / Bill of Quantities (BOQ)**

2. Execution of Work

In consideration of the payments to be made to the Contractor as hereinafter provided, the Contractor shall, upon and subject to the said conditions, **design, engineer, fabricate, supply, transport and erect the Pre-Engineered Building (PEB) structure along with associated civil and allied works**, as shown upon the drawings and described in the specifications and schedule of quantities.

The Contractor shall execute and complete the works in accordance with the **approved drawings, specifications and contract conditions** and as directed by the **Employer through the PMC / Engineer-in-Charge**.

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3. Variations in Work

Notwithstanding anything stated in the Notice Inviting Tender, Conditions of Tendering or Conditions of Contract, the Employer through the **PMC / Engineer-in-Charge** reserves the right to **alter drawings, vary quantities, add or omit any item of work or have portions of the work carried out through other agencies**, and such variations shall be carried out without prejudice to this Agreement.

4. Contract Conditions

The tender documents, specifications and contract conditions referred to herein shall be **deemed to form an integral part of this Agreement**, and both parties agree to abide by and perform their respective obligations in accordance with the terms contained therein.

5. Dispute Resolution

Any dispute or difference arising out of or in connection with this Agreement shall be **referred to arbitration in accordance with the provisions contained in the General Conditions of Contract**.

The decision of the arbitrator shall be **final and binding on both parties**.

All legal disputes arising out of this Agreement shall be subject to the **exclusive jurisdiction of the courts at New Delhi and the Hon'ble High Court of Delhi**.

Seal & Signature of the Tenderer



IN WITNESS WHEREOF

The parties to this Agreement have set their respective hands on the day, month and year first written above.

Signed and Delivered for and on behalf of

Jamia Hamdard

Name: _____

Designation: _____

Signature: _____

In the presence of:

1. Name & Address: _____
2. Name & Address: _____

Signed and Delivered for and on behalf of

The Contractor

Name of Firm: _____

Authorized Signatory: _____

Signature with Seal: _____

In the presence of:

1. Name & Address: _____
2. Name & Address: _____

Seal & Signature of the Tenderer



PROFORMA FOR LETTER OF UNDERTAKING

(TO BE EXECUTED ON NON-JUDICIAL STAMP PAPER OF Rs. 100/- AND SUBMITTED BY THE TENDERER ALONGWITH HIS TENDER IN A SEPARATE COVER ALONGWITH THE EARNEST MONEY)

To

Jamia Hamdard
Hamdard Nagar
New Delhi – 110062

Subject: Undertaking for Tender – Design, Engineering, Fabrication, Supply and Erection of Pre-Engineered Building (PEB) Structure and Associated Works at Jamia Hamdard Campus

Dear Sir,

I / We have read and examined the following tender documents relating to the **Design, Engineering, Fabrication, Supply and Erection of Pre-Engineered Building (PEB) Structure along with associated civil works, foundations, roofing and cladding systems, drainage systems and allied works at Jamia Hamdard Campus, New Delhi.**

The following documents have been carefully examined and understood by us:

1. **Notice Inviting Tender (NIT) No.** _____ **dated** ___ / ___ / _____
2. **General Conditions of Contract**
3. **Special Conditions of Contract along with Annexures**
4. **Drawings**
5. **Technical Specifications**
6. **Schedule of Quantities / Bill of Quantities (BOQ)**

I / We hereby submit our tender and undertake to keep our tender **valid for a period of 60 days from the date of opening of the tender.**

I / We hereby declare that **no deviation has been taken by us from the tender conditions, specifications and other tender documents.** In case any deviation is found to have been taken by us, our bid may be **rejected by the Employer without any further notice.**

I / We further undertake that **we shall not vary, alter or revoke our tender during the validity period of the tender.**

This undertaking is submitted in consideration of **Jamia Hamdard agreeing to open, evaluate and consider our tender for award of the work in accordance with the provisions of the tender documents.**

In the event of our tender being accepted, **I / We agree to abide by and fulfil all the terms and conditions of the tender documents and execute the work in accordance with the contract conditions.**

Seal & Signature of the Tenderer



I / We, the authorized signatory of M/s _____, a **sole proprietorship / partnership firm / company**, do hereby declare and undertake that we are participating in this tender **in the name of the aforesaid firm/company only**, and **no other firm, partnership, or company in which we have interest is participating in this tender for the same work.**

It is further declared that this proposal is **submitted independently and without any collusion, arrangement or understanding with any other bidder, firm or company.**

I / We also declare that this proposal has been **submitted in good faith and without any fraud or misrepresentation.**

Dated this _____ day of _____ 20 _____

Signature with Seal of the Company

(Duly authorized to sign the tender on behalf of the Tenderer)

Name : _____

Designation : _____

Name of Company (in Block Letters) : _____

Witness

Signature : _____

Name & Address : _____

Date : _____

Postal Address : _____

Telephone / Mobile : _____

Email Address : _____

Seal & Signature of the Tenderer



Proforma for Earnest Money (Bank Guarantee)

**REGISTRAR,
JAMIA HAMDARD
NEW DELHI – 110062**

In consideration of the JAMIA HAMDARD (hereinafter called “JAMIA HAMDARD”) having offered to accept the terms and conditions of the proposed agreement between **JAMIA HAMDARD** and _____ (hereinafter called “the said Contractor(s)”) for the work _____ (hereinafter called “the said agreement”) having agreed to production of an irrevocable Bank Guarantee for **Rs. _____/- (Rupees _____ only)** as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We, _____ (hereinafter referred to as “the Bank”) hereby undertake to pay to the JAMIA HAMDARD an amount not exceeding **Rs. _____/- (Rupees _____ only)** on demand by the JAMIA HAMDARD.
2. We, _____ (indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the JAMIA HAMDARD stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding **Rs. _____/- (Rupees _____ only)**.
3. We, the said bank further undertake to pay the JAMIA HAMDARD any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal.
The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such payment.
4. We, _____ (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the JAMIA HAMDARD under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Secretary JAMIA HAMDARD on behalf of the JAMIA HAMDARD certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.
5. We, _____ (indicate the name of the Bank) further agree with the JAMIA HAMDARD that the JAMIA HAMDARD shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers

Seal & Signature of the Tenderer



exercisable by the JAMIA HAMDARD against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the JAMIA HAMDARD or any indulgence by the JAMIA HAMDARD to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).
7. We, _____ (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the JAMIA HAMDARD in writing.
8. This guarantee shall be valid up to _____ unless extended on demand by the JAMIA HAMDARD.

Notwithstanding anything mentioned above, our liability against this guarantee is restricted to **Rs.** _____/- (**Rupees** _____ **only**) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Dated the ___ day of _____, 20__ for _____ (indicate the name of the Bank)

Seal & Signature of the Tenderer



Proforma for Performance Bank Guarantee

**The Registrar
Jamia Hamdard University
Hamdard Nagar,
New Delhi**

**B. G. No.
B. G. Date.
B. G. Amount Rs.....
B. G. Exp. Date.....**

In consideration of the Jamia Hamdard University having offered to accept the terms and conditions of the proposed agreement between **Registrar JHU** and,, for the work (hereinafter called “the said agreement”) having agreed to production of an irrevocable Bank Guarantee for **Rs/-** (Rupees Only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We, **Bank** Branch Office at hereby undertake to pay to the JHU an amount not exceeding **Rs/-** (RupeesOnly) on demand by the JHU.
2. We, **Bank** Branch Office at do hereby undertake to pay the amount due and payable under this guarantee without any demure, merely on a demand from the JHU stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(S). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding **Rs/-** (Rupees Only)
3. We, the said bank further undertake to pay the JHU any money so demanded notwithstanding any dispute or dispute raised by the contractor(S) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the contractor(S) shall have no claim against us for making such payment.

4. We, **Bank** Branch Office at further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the JHU under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Secretary JHU on behalf of

Seal & Signature of the Tenderer



the JHU certified that the terms and conditions of the said agreement have been fully and property carried out by the said Contractor(S) and accordingly discharges this guarantee.

5. We, **Bank** Branch Office at ----- further agree with the JHU that the JHU shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or time to time any of the powers exercisable by the JHU against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the JHU or any indulgence by the JHU to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
6. This guarantee will not be discharged due up-to change in the constitution of the Bank or the Contractor(s).
7. We Bank lastly undertake not to revoke this guarantee except with the previous consent of the JHU in writing.
8. This guarantee shall be valid to (Date) unless extended on demand by the JHU.

NotWithStanding anything contained herein above:

- I. Our liability under this guarantee shall not exceed **Rs** -----/- (Rupees ----- Only).
- II. This Bank Guarantee shall be valid upto -----.
- III. The Bank is liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before -----

Dated the ----- day of -----2022 for **Bank**.

Seal & Signature of the Tenderer



Proforma for Mobilization Advance (Bank Guarantee)

**The Registrar
Jamia Hamdard University
Hamdard Nagar,
New Delhi**

**B. G. No.
B. G. Date.
B. G. Amount Rs.....
B. G. Exp. Date.....**

In consideration of the **Jamia Hamdard University** having its office at **Hamdard Nagar, New Delhi** in the State of **Delhi** (herein after called '**The Employer**' which expression shall unless repugnant to the subject or context include its successors and assignees) having agreed under the terms and conditions of contract vide its acceptance letter / WO No. dated made between herein after called the said Contractor and the Employer in connection with (hereinafter called **the said contract**), to make at the request of the contractor mobilization advance of **Rs.- (Rupees only)** for utilizing it for the purpose of contract on his furnishing a guarantee acceptable to the employer, we the **Bank** (hereinafter referred to as '**the said Bank**') a company under the companies Act, 1956 and having our registered office ----- do hereby guarantee the due recovery by the employer of the said advance to the terms and conditions of the said contract. If the said contractor fails to utilize the said advance for the purpose of the contract and/or the said advance is not fully recovered by the employer, we the said Bank hereby unconditionally and irrevocably undertake to pay to the employer on demand and without demur to the extent of the sum of **Rs. -----/- (Rupees ----- only)**.

1. We, the said Bank further agree that the Employer shall be the sole judge of and as to whether the said contractor has not utilized the said advance or any part thereof for the purpose of the said contract and the extent of loss or damage caused to or suffered by The Employer on account of the said advance not being recovered in full and the decision of the Employer in this respect, shall be final and binding on us.
2. The Employer shall have the fullest liberty without affecting in anyway the liability of the Bank under this Guarantee or Indemnity, from time to time to vary any of the terms and conditions of the said contract of the advance or to extend time of performance by the said contractor or to postpone for any time and from time to time any of the powers exercisable by it against the said contractor and either to enforce or forbear from enforcing any of the terms and conditions governing the said contract or the advance or securities available to the Employer and the said Bank shall not be released from its liability under these presents by any exercise by the Employer of the liberty with reference to the matters aforesaid or by reason of time being given to the said contractor or any other forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said contractor or of any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of so releasing the Bank from its such liability.
3. It shall not be necessary for the Employer to proceed against the contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security which the Employer may have obtained or obtain

Seal & Signature of the Tenderer



from the contractor shall at the time when proceedings are taken against the Bank hereunder be outstanding or unrealized.

4. We, the said Bank lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the Employer in writing and agree that any change in the constitution of the said contractor or the said Bank shall not discharge our liability hereunder.

NOTWITHSTANDING ANYTHING CONTAINED HERE IN ABOVE:

- (A) Our liability of the Bank under this guarantee shall not exceed **Rs. -----/- (Rupees --- --- only).**
- (B) This bank guarantee shall be valid upto -----.
- (C) We are liable to pay the guarantee amount or any part thereof under this Bank Guarantee only and only if you serve upon the Bank a written claim or demand on or before ----- --- under the Guarantee is lodged with the Bank on or before -----

For and on behalf of the Bank.

Seal & Signature of the Tenderer



SPECIAL CONDITIONS OF CONTRACT

A GENERAL

1. Contract

- 1.1 The **Owner, Jamia Hamdard**, located at **Hamdard Nagar, New Delhi**, has appointed **M/s Bulten Architecture and Design Consultancy LLP** as the **Project Management Consultant (PMC) / Engineer-in-Charge** for the **design, engineering, fabrication, supply and erection of Pre-Engineered Building (PEB) structure along with associated civil and allied works** at the **Jamia Hamdard Campus**.
- 1.2 The scope of work broadly consists of **design, engineering, fabrication, supply, transportation and erection of Pre-Engineered Building (PEB) structure including associated civil works such as foundations, structural supports, roofing and cladding systems, drainage systems and other allied works**, as specified in the **Technical Specifications, Drawings and Bill of Quantities (BOQ)**.
- 1.3 The entire work covered under this tender document shall be treated as a **Works Contract**, and the Tenderer shall quote rates accordingly.
- 1.4 The rates quoted by the Tenderer shall be **inclusive of all costs, allowances, taxes and duties, freight, royalties, loading/unloading, insurance, handling charges, labour costs, water, electricity, site establishment, plant and machinery and all other incidental expenses required for execution and completion of the work**, including applicable GST.
- 1.5 Under no circumstances shall the **Employer / Owner compensate any increase in cost of labour, materials or other inputs during the currency of the contract**, except where specifically provided under the **Contract Price Adjustment provisions in the General Conditions of Contract (GCC)**, if applicable.
- 1.6 In case **any new taxes, duties or statutory levies are imposed by the Government during the currency of the contract**, the Employer may reimburse such additional statutory payments

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to the Contractor **subject to submission of documentary evidence and compliance with applicable laws.**

- 1.7 The Tenderer shall **not include any conditional statements or qualifications having technical or financial implications in the bid.** Any tender submitted with such conditions may be **liable for rejection by the Employer without assigning any reason.**
- 1.8 In the event of **any discrepancy between the description of items in the Bill of Quantities (BOQ) and the Special / General Conditions of Contract,** the description contained in the **Bill of Quantities shall prevail,** unless otherwise clarified by the Engineer-in-Charge.
- 1.9 All **composite items of work shall be executed by the Contractor as complete in all respects,** including supply of materials, labour, equipment, accessories and incidental works necessary for proper completion of the item, **even if not specifically mentioned but required for satisfactory performance of the work,** unless otherwise stated in the Bill of Quantities.
- 1.10 Any dispute arising out of or in connection with this contract shall be **subject to the exclusive civil jurisdiction of the courts at New Delhi,** including the **Hon'ble High Court of Delhi.**

2 Roles and Responsibilities

2.1.1 PMC Consultant – M/s Bulten Architecture and Design Consultancy LLP

2.1.2 Site evaluation

2.1.3 Designing and detailing of Architecture, MEPF and vetting & approval of PEB Drawings by GC or GC appointed PEB vendor for the project

2.1.4 Providing Architectural, Approval of Structural and Services drawings, Construction drawings

2.1.5 Interpretation of drawings and specifications.

2.1.6 Preparation and processing of tender documents.

2.1.7 Communication/ Coordination between Contractor and the Employer/Owner.

2.1.8 Any Correspondence regarding the project should be made only with the PMC/Engineer In-Charge.

2.2 OWNER/EMPLOYER

2.2.1 Furnishing design inputs/approvals to the PMC.

2.2.2 Help in resolution of the issues related to the project, on and off site.

2.2.3 Help ensuring steady cash flow and timely payments for completing the project.

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- 2.2.4 Owner shall delegate authority to the PMC/Engineer In-charge to act as their Representatives.
- 2.2.5 Help with all supporting documents required at various stages of project for getting approvals & clearances from local bodies.

2.3 CONTRACTOR

- 2.3.1 The contractor shall execute the work as per the provisions of the contract.
- 2.3.2 Contractor shall provide all labour, including the supervision thereof, materials, and constructional plant and all other things, whether of a temporary or permanent nature, required in and for proper execution and maintenance of the work. None of contractor's supervisor, engineer, labour should be withdrawn from the work without due notice being given to Owner/PM and without seeking PM's approval. The contractor shall employ such persons who are skilled and experienced in their respective trades. The Owner /PM however reserves the right to remove any person employed by contractor if found incompetent, negligent and non-cooperative.
- 2.3.3 The contractor shall take full responsibility for the adequate stability and safety and security of the equipment and scaffoldings deployed at the site. Execute the work by coordinating with Designer/Architect/Project Manager, with best workmanship and sound practice as per specification and drawings. All required statutory approvals like for excavation of earth, would be sought by the contractor at no additional cost.
- 2.3.4 Adhere to time lines strictly and avoid possible slippages.
- 2.3.5 Ensure all workers engaged on the work follow **safety measures**.
- 2.3.6 Coordinate with other agencies and settle issues amicably along with PMC to obtain all necessary approvals and clearances from statutory and concerned authorities/agencies.
- 2.3.7 Ensuring **safe & hygienic practices** at all work centres, create awareness and maintain the safety sense in the rank and file of contracting companies. Create and provide necessary provisions at the site for all staff and workmen.
- 2.3.8 The contractor shall set out the works and shall be responsible for true and perfect setting out of the same for proper position, levels, dimensions and alignment. The contractor shall check all their aspect during construction and correct the error if any at his own cost. He shall also maintain the baselines & benchmarks.
- 2.3.9 The contractor shall keep the site neat and clean at all times and follow good housekeeping practices. All debris and waste shall be removed from site periodically or as directed by PMC/Engineer In-charge.

2.4 CONTRACTOR'S REPRESENTATIVE

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- 2.4.1 The Contractor shall appoint at the site Engineer-in-Charge / Project Coordinator for execution of the work at the site. The contractor shall at places indicated elsewhere, furnish all the necessary information (names, educational qualifications, number of years of experience in the field etc) about the site engineer(s) / project coordinator proposed to be deputed for the project. The above Site Engineer(s) / Project Coordinator shall be constantly in attendance during the currency of the contract.
- 2.4.2 Attend the meetings on the site with the Owner/Employer, PMC/Engineer In-Charge and other Contractors & agencies working on site.
- 2.4.3 Review frequently all aspects of progress, quantity, cost, sourcing, priorities of various activities and interactions and update Project Manager about the same through structured reporting system or PERT/BAR Chart.
- 2.4.4 Review the time line for various elements and coordinate with sub-contractors & agencies for the Project.
- 2.4.5 Documenting various activities, reporting and briefing the same to all Project Authorities.
- 2.4.6 Responsible for quality, security, safety, human relations and other components of the project. Documenting various activities, reporting and briefing the same to all Project Authorities.
- 2.4.7 No disturbance should happen to the existing functionalities during day to day execution operations.
- 2.4.8 Coordination with Executive Engineer/PMC/Engineer Incharge through contractor and monitoring of procurement of materials,
- 2.4.9 Resolution of issues related to the project, on and off site.
- 2.4.10 Monitoring of timely completion of work including monthly progress, quality and billing.
- 2.4.11 Supervision and Management of the project. Instructions issued by the PMC/Engineer In-charge to the contractor instructions in respect of:
- a. Non approval/rejection of work due to bad workmanship, use of non- approved materials
 - b. Matters of urgency involving the safety or protection of persons and or property.
 - c. Progress of work.
- 2.4.12 Conduct regular weekly site progress meetings at the site for evaluation of accepted programme, prepare and issue MIS.
- 2.4.13 Works under this contract shall be executed as per specification and workmanship as laid down in contract and as per the Supervisions the Engineer Incharge/PMC. But such supervisions and instructions do not in any way absolve the Contractor from his obligation to remedy any defects, which have been brought to the notice to the Contractor by the PMC/Engineer In-charge or that

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may have existed at any stage of the work and detected later even after the same has been cleared by the PMC/Engineer In-charge.

- 2.4.14 Carry out along with Engineer Incharge/PMC. joint measurements of the works executed. The contractor shall provide necessary help, equipment and labour, etc. as required.
- 2.4.15 Bills thus prepared, and approved by the PMC/Engineer In-charge shall be submitted to the Employer/Owner for Payment & further action.
- 2.4.16 Compliance of BoQ & list of makes (provided in tender).
- 2.4.17 The Project Manager with prior approval of the Engineer Incharge/PMC shall provide
- a. variation/deviation.
 - b. extra item rates.
 - c. Extension of time.
- 2.4.18 Scheduling and organizing the activities relating to handing over the completed work.
- 2.4.19 Ensuring the safety, security and cost aspect of the project.
- 2.4.20 Following all the safety provisions issued from government agencies/ authorities as applicable to works site as well as for activities outside the works site.

2.5 WORKS TO BE CARRIED OUT UNDER DIRECTION OF EXECUTIVE ENGINEER/PMC

- 2.5.1 Under this contract work shall be executed as per the directions of EE/PMC/Engineer In-charge or their representative.
- 2.5.2 The Contractor will closely co-ordinate and co-operate with other Contractors required to work on the structures to enable smooth working and timely completion of the project.

3 Tender Rates

- 3.1 The rates quoted by the bidder in the schedule shall be firm during the currency of the contract period and deemed to include for everything spelt out in the specification and shall inter alia include the cost of the following in addition to the cost of materials, transportation and labour as given below:
- 3.1.1 To meet the project schedule provision of adequate scaffolding, centring materials, formwork, hiring of tools and plant equipment etc, shall be ensured within the quoted price.
- 3.1.2 All liabilities, PF, ESI, fire insurance, Workmen's compensation policy, Third Part Liability, Contractors All risk Policy etc including all statutory requirements.

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- 3.1.3 All taxes, royalty charges, costs of statutory approvals etc and any other levied by the Government and other public bodies.
- 3.1.4 Royalties and Patent Fees/ charges etc.
- 3.1.5 Temporary sanitary facilities.
- 3.1.6 Watch and ward service and security.
- 3.1.7 Temporary establishments such as Contractor's site offices, covered/open storage space for building materials and stores, Laboratories and any services required for successful completion of work.
- 3.1.8 Allied preliminary enabling works.
- 3.1.9 Liability for protection and care of work stipulated in the contract document.
- 3.1.10 Cleaning of site and building after completion of work including removal of all temporary structures constructed by the Contractor.
- 3.1.11 Theodolites and Total Station, levels, prismatic compass, steel tapes and all other surveying instruments found necessary at the works shall be provided by the Contractor for the due performance of this contract.
- 3.1.12 The Contractor shall supply all measuring steel tapes, scaffolding and ladders that may be required for taking measurements.
- 3.1.13 Contractor should carefully study lift of materials as he will have to carry out the work at any and all levels at the quoted rates.
- 3.1.14 Use of any and all diesel/petrol operated Plant & equipment.
- 3.1.15 The Contractor shall provide everything necessary for the proper execution of works according to the true intent and meaning of the drawings, specifications and schedule of quantities taken together, whether the same may or may not be particularly shown or described therein, provided that the same can be inferred there from.
- 3.2 Dust Control: The Contractor shall ensure that while carrying out the construction, water is regularly sprayed on access roads and around worksites to minimize the nuisance because of dust.

4 Bill of Quantities (BOQ):

- 4.1 A BOQ with probable quantities in respect of the work and specifications accompany these special conditions. The bill of probable quantities is liable to be operated by omissions or variations or additions at times, at the discretion of PM/Owner. Such variation in the quantities shall not, however, vitiate/prejudice the contract in any way whatsoever and Contractor shall be paid for actual measured quantities of work executed by him at the rates given in the BOQ.

5 Commencement & chronology of Work

Seal & Signature of the Tenderer



5.1 Commencement of Work

The Contractor shall commence the work **within 7 days from the date of issuance of the Notification of Award (NoA) / Letter of Award (LoA)** or from the date of handing over of the site, whichever is earlier.

Design & Engineering Phase

5.2 Site Study & Initial Assessment

Immediately upon commencement of work, the Contractor shall undertake a **detailed site study**, including:

- verification of site levels and layout
- identification of existing utilities and service routing
- assessment of soil strata relevant to foundation works
- confirmation of structural grid and building layout

A **Site Study Report** shall be submitted to the **Engineer-in-Charge / PMC within 5 days** of commencement of work.

5.3 Engagement of PEB Design Team

The Contractor shall mobilize the **PEB structural design team immediately upon award of contract** and initiate structural design based on approved layouts and loading parameters. The Contractor shall submit **preliminary structural design calculations and STAAD model (or equivalent structural analysis model) within 7 days of award of work.**

5.4 Anchor Bolt (AB) Drawings

The Contractor shall submit **Anchor Bolt layout drawings along with pedestal details and foundation interface drawings within 10 working days from award of work** for approval by the **Engineer-in-Charge / PMC.**

5.5 General Arrangement (GA) Drawings

The Contractor shall submit **General Arrangement (GA) drawings including structural grid layout, column placement, roof geometry, bracing systems and structural members within 21 days from the date of award of the project.**

Fabrication shall commence **only after approval of GA drawings by the Engineer-in-Charge / PMC.**

Civil & Foundation Works

5.6 Foundation Works

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The Contractor shall commence **foundation excavation within 7 days from approval of Anchor Bolt drawings.**

Foundation works including:

- excavation
- PCC and RCC works
- pedestal construction
- anchor bolt placement

shall be executed as per approved drawings.

Fabrication & Production Phase

5.7 Fabrication of PEB Structure

5.7.1. Upon approval of **GA drawings and structural design**, the Contractor shall initiate **fabrication of PEB structural components at the approved manufacturing facility.** Fabrication, inspection and dispatch shall be **completed within 6 weeks from GA approval.**

5.7.2. The GA & STAAD & Structural arrangement shall be verify by IIT/NIT by contractor at their own cost.

5.8 Fabrication Monitoring

The Executive Engineer / PMC shall have the right to **inspect the fabrication facility** and manufacturing process, including:

- raw materials
- welding procedures
- fabrication process
- painting and surface treatment
- quality control testing

Structural Erection Phase

5.9 Delivery of Structural Components

The Contractor shall ensure **timely delivery of fabricated structural components to site in accordance with the erection sequence.**

5.10 Structural Erection

The Contractor shall mobilize erection teams and equipment immediately upon availability of foundations and structural components.

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The Contractor shall ensure **completion of primary structural erection including columns, rafters, bracing systems and secondary members within 90 days from award of the project.**

Roofing & Building Envelope

5.11 Roofing & Cladding Works

After completion of structural erection, the Contractor shall proceed with:

- roof sheeting installation
- wall cladding systems
- ridge caps and flashings
- gutters and rainwater down-take pipes
- Other related works

These works shall be completed as per **approved technical specifications.**

Services Installation Phase

5.12 HVAC System Installation

The Contractor shall initiate **HVAC installation works including ducting, equipment installation, piping and insulation after completion of primary structural erection and before finishing works.**

All HVAC works shall comply with approved drawings and specifications.

5.13 Electrical Works

Electrical works including:

- cable routing
- distribution boards
- lighting systems
- earthing and grounding systems
- power supply connections
- other related works

shall be carried out **in coordination with the structural and architectural works to ensure timely completion.**

5.14 Fire Fighting & Safety Systems

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Installation of **fire detection, fire alarm and firefighting systems** shall be carried out in coordination with HVAC and electrical systems as per applicable codes and approved drawings.

Interior Finishing Works

5.15 Interior Finishing Materials

The Contractor shall submit **samples and specifications of finishing materials for approval**, including:

- flooring materials
- ceiling systems
- partition systems
- painting and coatings
- doors and windows
- other related works

Procurement of approved materials shall be aligned with the project schedule to avoid delays.

Furniture & Equipment Installation

5.16 Furniture Works

Furniture works including **fixed furniture, laboratory furniture (if applicable), cabinetry, workstations and storage systems** shall be undertaken **after completion of finishing works**. Furniture drawings and shop drawings shall be submitted for approval before fabrication.

Project Monitoring & Scheduling

5.17 Project Schedule

The Contractor shall submit a **detailed project schedule within 7 days of award of work**, clearly indicating:

- design milestones
- fabrication schedule
- civil works timeline
- erection sequence
- services installation schedule
- finishing works timeline
- furniture installation schedule

The schedule shall be prepared using **CPM / bar chart methodology**.

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5.18 Weekly Progress Monitoring

The Contractor shall participate in **weekly progress review meetings with the PMC / Engineer-in-Charge**, and shall submit updated progress reports including:

- work progress
- fabrication status
- material procurement status
- manpower deployment

Project Completion

5.19 Final Completion

The Contractor shall ensure that **all works including structural erection, roofing, cladding, civil works, services installation, interior finishing and furniture works are completed within the stipulated contract period.**

The total project completion period shall not exceed 135 days from the date of issuance of the Letter of Award, unless extended by the Employer in accordance with the contract conditions.

Delay Liability

5.20 Delay Responsibility

Any delay in **design submissions, fabrication, delivery, erection, installation of services, finishing works or furniture installation attributable to the Contractor** shall attract penalties as per the **Liquidated Damages clause of the contract.**

6 Facilities for Contractor's Employees

- 6.1 The Contractor shall make his own arrangement for the housing and welfare of his staff and workmen including adequate drinking water and sanitary facilities. The Contractor shall also make his own arrangements at his own cost for transport where necessary for his staff and workmen to and from the sites of the works. The necessary drinking water and sanitary facilities for staff & labour & visitors at site shall be provided and maintained by the contractor at no extra cost.
- 6.2 The Contractor shall at his own expense make adequate arrangements for the provision of temporary Crèche (Bal-Mandir) facility for the children of construction labours employed by the contractor and the contractor shall maintain & operate it up to the satisfaction of PMC/Engineer In-charge without any extra cost.

7 Water and Electricity

- 7.1 The Contractor might be required to arrange for water from the municipal water supply or by tankers as necessary at his cost and the Contractor shall make his own arrangements for further distribution. However, no claims will be entertained, in terms of cost, time or quality, on account

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of shortfall in water supply. on completion of contract hand over the same to Owner/Employer in working condition.

- 7.2 The Contractor at his own cost will arrange and install electric meter required for execution of the works & the Contractor shall make his own arrangements for power backup, tapping the supplies and internal distribution. The Contractor shall ensure that all connections are carried out strictly in accordance with rules and regulations and restrictions enforced by the licenser/Government if or by any other competent authority from time to time. The distribution board should be weatherproof. The temporary cabling to be appropriately rated insulated and supported with proper joints where necessary. Contractor shall bear the cost metered connection/electricity bill.
- 7.3 The Owner will give necessary authority letters and use as per the availability.
- 7.4 The Contractor shall provide all artificial light required to enable to complete the work in the specified time including the workmen of any subcontractors or special tradesmen which may be required by the Contractor, at his own cost
- 7.5 Notwithstanding the above, it will be sole responsibility of the contractor to make available alternative power supply so that uninterrupted power supply is available for the construction work.

8 Dimensions

- 8.1 Figured dimensions are in all cases to be followed and in no case they should be scaled. Large-scale details take precedence over small-scale drawings, in case of the discrepancy; the Contractor is to ask for an explanation before proceeding with the work.

9 Site Order Book

- 9.1 A site order book with pages in triplicate will be maintained by the PMC/Engineer In-charge. The orders regarding the work shall be entered in this book by the PMC/Engineer In-charge or any other officer authorized by him and the contractor and the authorized representative of the contractor must sign the same in token of having received such instructions.

10 Record Drawings or As Built Drawings

- 10.1 The Contractor shall during the course of execution, prepare and keep updated a complete set of 'record' drawings recording all works, which shall be corrected/ marked-up to show each and every change from the working drawings and showing the exact location, size and kinds of work etc. This set of drawings shall be kept on the site and shall be used for record purpose. Changes recorded shall be countersigned by the PMC/Engineer In-charge and the Contractor. Copies of 'As Built drawings shall be supplied to the PMC/Engineer In-charge on request. The Contractor shall submit complete 'record' drawings on tracings or electronic reproducible as directed by the PMC/Engineer In-charge within 15 days of the completion of that portion of the work to which the same pertains.
- 10.2 In case, the Contractor fails to submit completed "As Built", he shall be liable to pay sum equivalent to 0.5 per cent of the value of work subject to maximum of Rs.5,00,000/- and the decision of PMC/Engineer In-charge shall be final and binding.

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11 Dispatch of Materials

- 11.1 Materials shall not be dispatched from the manufacturer's works or to the Site without clearance from the PMC/Engineer In-Charge or his Representatives and Engineer from Jamia Hamdard and the Contractor shall seek permission for the same for such dispatch when necessary.

12 Non-Operation of Tender Items

- 12.1 The Owner reserves the right not to operate any item from the Schedule of Quantities without assigning any reasons. Nothing shall be payable to the Contractor in such case.

- 13 Adequate equipment at site:** The Contractor shall provide adequate equipment and machinery in good working condition at site during the entire period of construction and the number of equipment required shall be arrived at with respect to the Time Schedule of work agreed to at the time of award of Contract or as assessed by PMC/Engineer In-charge from time to time.

- 14 Work by mechanical means:** The work shall, wherever possible, be carried out with the use of Mechanical means / Equipment, compressed air equipment (chisels, vibrators, and air/water jets), hoists for material, wheel barrows etc. Oxygen and acetylene gas cylinders, wire ropes, lifting tools & tackles, slings as recommended by PMC/Engineer In-charge at no extra cost. The Contractor is required to prepare a list of Machinery/Equipment before award of work and shall adhere to this list.

- 15 Work through other agency in case of delay:** If because of the main Contractor's defective workmanship or inordinate delay in completing particular item of work, any of the items in the scope of this tender are given to any other agency for execution, and if the agency claims extra amount due to extra work necessary to be done, all such extra amounts claimed, will be deducted from the main Contractor. Or if, there are no dues to the main Contractor, this amount will be deducted from the Security Deposits or Retention Money, and the same will be binding on the contractor.

16 Advertisements and Publications

- 16.1 The Contractor, without the consent in writing of the PM/Owners, or in conjunction with any other person, shall not publish any articles, photographs or other illustrations relating to the works.
- 16.2 The contractor shall not affix or place any placards or advertisements of any description or permit the same to be affixed or placed in or upon hoarding gantry building, or structure other than that approved in advance by the PMC/Engineer In-charge.

B. TIME CONTROL

17 Time Schedule and Work Program

- 17.1 Contractors shall submit detailed programme, demonstrating the scheduled dates that can be met, giving details of resources - manpower, equipment and supervisory staff, required for achieving the programme. After the work is awarded, the Contractor shall prepare and submit a detailed Bar chart, for approval by PMC/Engineer In-charge. This time schedule after approval

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shall form a part of the contract and the work shall be carded out in all respects as per this Bar chart.

- 17.2 Time is the essence of this contract. The Contractor shall properly assess his capabilities and fully satisfy himself before start of work that he will be able to adhere to the specified time schedule.
- 17.3 The Contractor shall furnish to PMC/Engineer In-charge weekly progress report in triplicate on Saturday of every week indicating the following and shall attend fortnightly site meeting and/or at PM's/Owner's office to review the same.

Item of work	Scheduled progress of work	Actual progress	Reason for shortfall	Steps to make-up shortfall	Resource deployment on site
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Tasks to be taken up urgently	Task delayed with time of delay	Reason for delay	Critical Information Required, if any	Material in Hand	Accidents (if any)
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Drawings/ Details Required (if any)					
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If the contractor apprehends any delay in construction of work due to drawings and details required, he shall immediately advise PMC/Engineer In-charge in writing. The temporary stoppage, if any, not attributable to the contractor shall be considered by the PMC/Engineer In-charge while considering extension of stipulated date of completion.

- 17.4 Contractor shall employ sufficient number of skilled and unskilled labour required for the work for maintaining the progress of work as stipulated in the time schedule. The day-to-day labour strength, trade wise, should be intimated in writing to PMC/Engineer In-charge weekly. The skilled and unskilled labour shall be increased if required by PMC/Engineer In-charge to maintain the progress of work.
- 17.5 The whole of the work including all extras and additional items if any, when ordered are required to be completed in the time stipulated in the contract. The Contractor will be required, if necessary, to work in additional shifts in order to complete all works by the stipulated date. No extra payment will be allowed on the contracted amount on account of additional shifts involved under the contract.
- 17.6 The whole of the work must be executed at all levels and by such time as directed by PMC/Engineer In-charge.

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17.7 No work shall be done on Sundays & holidays without the sanction in writing of the PMC/Engineer In-charge.

17.8 The Contractor shall submit to the PM, within 15 days of approval of the construction schedule, a cash flow statement indicating monthly billing by the Contractor and costs of materials to be supplied by the Owner along with their recovery from subsequent bills.

18 Working Hours

18.1 Contractor will be permitted to work extra hours and if necessary, round the clock, subject to local rules and regulations. Necessary permissions to work extended hours / holiday to be obtained by the contractor from required statutory authority / Project Manager.

19 Progress Evaluation and Review

19.1 The Contractor has to adhere to the interconnected time schedules as specified by PMC/Engineer In-charge. The Contractor shall submit his offer taking into account the programme as specified above. The criticality shall be reviewed periodically in consultation with PMC/Engineer In-charge. The time scheduling of the activities shall be so done by stipulated stage-wise and total completion time, agreed at the time of award of work.

19.2 The Contractors shall plan well in advance and shall arrange adequate resources in time to adhere to the time schedule at each stage and this adherence will be a part of the Contractor's performance under the contract.

19.3 The work shall be executed as per the programme approved by PMC/Engineer In-charge. The Owner or his authorized representative and the PMC/Engineer In-charge shall review progress of work in every 15 days period.

20 Site Meetings

20.1 Progress and quality evaluation meetings will be held at the site every week. The Contractors senior Representative-in-charge of the project along with his site-in-charge and other staff including staff of approved sub-contractors and suppliers as required shall participate in these progress review meetings and ensure all follow up actions. Any additional review meetings shall be held if required, as decided and notified by the PM, which also shall be attended by the above referred, representative.

The various parts of the contract are intended to be complementary to each other but should any discrepancy appear, or any misunderstanding arise as to the import of anything contained therein, the explanation of the PMC/Engineer In-charge shall be final & binding. The correction of any error or omission of the drawings and specifications may be made by PMC/Engineer In-charge which will be binding on the contractor.

C. SAFETY & PHE

21.1 Safety code as per relevant IS Codes and CPWD norms shall be strictly adhered to and compliance recorded periodically.

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- 21.2 Garbage/construction waste material should not be thrown to ground from floors. If lifting machines (like lift, hoist) is provided for personal transport, limit switch control shall be provided.
- 21.3 The drinking water shall be obtained from approved sources and shall be stored carefully.
- 21.4 Any openings and cut out provided on floors shall be covered to avoid accidents.
- 21.5 Safety nets are to be provided when work is going on at heights.

D. COST CONTROL

22 Joint Measurement for Extra Items/ Works

- 22.1 In the event of the Contractor having to execute any work or provide any material in regard to which he may propose to claim extras, he shall immediately notify the Project Manager in writing and shall at once make arrangements to take the measurements of the said work or materials with the Project Manager.
- 22.2 The fact of such joint measurement having been made will in no way commit the Project Manager to recognition of the claim if he considers such claim without foundation. The Project Manager shall at all times have full access to the Contractor's time book and may daily check the time of any extra works with the Contractor's time keeper or otherwise but the fact of his agreeing upon any time shall in no way bind the Project Manager to value the work other.

23 Billing and Payments

- 23.1 The Contractor shall submit the bill with a minimum value of 50 Lakh and the Contractor will be paid with the bill cycle of minimum amount mentioned above. On the certificate of the PMC/Engineer In-charge the amount due to him on account of the value of the permanent work executed as mentioned in the bill submitted subject to a retention of the percentage named in the Tender until the amount retained shall reach the "Limit of Retention Money" named in the Tender.
- 23.2 Payment shall be on the basis of quantum of work actually carried out. Item rates shall remain valid for any variation in the estimated quantities up to the limits specified in clause. Payment will be made against the permanent works executed.
- 23.3 45 Days Payment Cycle for Bill clearance from the Date of Approval from PMC shall be followed
- 23.4 Extra item of work and rates shall be either as derived from the Tender items or from analysis of material and Labour.
- 23.5 Final payment shall be made only after fulfilling all conditions mentioned against 'Testing & Guarantee'.
- 23.6 Vouchers and/or Challans for various materials required for the works shall be produced to the PMC/Engineer In-charge on demand.

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- 23.7 Final bill shall be paid as per the provisions of contract after final certification and after completion of all works as per drawings, BOQ, specifications & instructions of PMC/Engineer In-charge and on testing / commissioning / guarantee.
- 23.8 Method of Measurement: The work shall be measured as per the CPWD Specifications. In case of non-availability of relevant provisions in the CPWD Specifications, then IS 1200 shall be applicable.
- 23.9 Deductions from payments: TDS as per govt. guidelines and 0.25% for JHRW.

24 Advance against Material at Site

- 24.1 Advance @75% of cost against all non-perishable items supplied on site duly supported with invoices and will be recovered pro-rata from the subsequent bills for the quantity consumed. Full advance against materials at site will be recovered before final bill irrespective of any quantity balance at site.
- 24.2 **MOBILISATION ADVANCE:** The Owner shall at the request of contractor, pay to the Contractor a Mobilisation Advance of 10% of the contract value, against Bank Guarantee of an equivalent amount from a Nationalised/Scheduled Bank as per approved format and the advance shall be recovered from the work Running Account bills of the Contractor. It shall be recovered from second running bill of and shall be fully recovered by 80% of work completion.-Interest at the rate of 2% per annum over SBI lending rates shall be deducted for the advance amount.

25 Payment of Interim Bills

- 25.1 Interim on account payments will be made periodically from time to time, against the value of work done. Payment will be made on receiving Interim Certificate for payment from the PMC/Engineer In-charge up to the amount approved or passed by the PM, whose certificate of such approval of the sum as payable shall be binding on both the parties. The Contractor shall be responsible for furnishing all necessary measurements as required by the PM, recorded jointly or otherwise, as directed by the PM, to enable certification of amounts payable. However, all such Interim payments shall be regarded as payments by way of advance against the final payment only, and not preclude the requirement that bad, unsound and imperfect or unskilful work be removed and taken away and reconstructed or re - erected, nor shall it conclude, determine or affect in any way the power of the PMC/Engineer In-charge as to the final settlement and adjustment of the accounts or otherwise, or in any way vary or affect the contract.
- 25.2 PMC certified contractor bill shall be submitted for a minimum bill value of 50 Lakh and 70% of the approved works bill shall be released within 7-10 days of bill submission and remaining amount shall be released in a maximum of 3 week time frame from the date of submission. The time period of 7-10 days will be counted after PMC/Engineer In-Charge approve the bill submitted by the Contractor.

26 Final Bill

- 26.1 The Contractor shall submit within 30 days of Final completion of the work the Final Bill for the works carried out along with all the necessary supporting measurements as required by the PMC/Engineer In-charge. In case the Contractor fails to do so, the PM's certificates of the

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measurements and of the total amount payable for the work accordingly, shall be final and binding on all parties. The final bill shall be processed after complete measurements and valuation within 3 months from the submission of the Bill.

26.2 The Contractor or their representative shall accompany PM, the Owner or their representatives when required to do so and assist in taking measurements and shall agree to the measurements recorded on the spot.

26.3 If the Contractor fails to accompany any person that has been duly authorized by PMC/Engineer In-charge to take measurements, he shall be bound by measurements recorded by PMC/Engineer In-charge or his representative.

27 Compensation

27.1 NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK TO BE CARRIED OUT:

27.2 If the Contractor is required to carry out additional works/floors during the tenure of this contract, as instructed by PMC/Engineer In-charge in writing, he shall carry out the same at his quoted unit prices of items and will not be entitled to any extra claim on this account.

27.3 PERFORMAMCE GUARANTEE

27.3.1 Contractor shall submit Performance Guarantee equivalent to 3% of the accepted value of the tender valid till project completion. It shall be submitted within 28 days from acceptance of work Order, and an extension of 7 days to be granted on request upon showing a valid reason. The bidder shall furnish PBG in form of Bank Guarantee from National Banks/Scheduled as per proforma included in the tender document. The amount of EMD would be adjusted from the total amount of Performance Guarantee.

27.4 RETENTION MONEY

27.4.1 Security Deposit in the form of Retention Money shall be deducted from the contractor's running account bill at the rate of five percent (5%) of the bill amount till it reaches 50 lacs in total value.

27.4.2 The Retention money shall not bear any interest. All compensation or other sums of money due to be payable by the Contractor to the Employer under the terms of this contract may be deducted from his security deposit and the contractor shall have no objection for the same.

27.4.3 The Retention money shall be released as follows: 50% after Virtual Completion (i.e., certificate of virtual completion from PM) and balance 50% after successful completion of Defect Liability Period starting from the date of handover/site possession upto 1 year. The balance 50% amount to be released against the BG of validity 1 year submitted by the contractor.

28 Defects Liability Period:

28.1 The Defects Liability period is 12 months after the date of virtual completion as may be certified by Project Manager/ Engineer in Charge.

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29 Existing Materials:

29.1.1 Existing HVAC materials/equipment available at site to be checked and used at its maximum capacity by the Contractor and with approval from PMC/Engineer In-Charge.

29.1.2 List of existing material/equipment to be submitted by the Contractor and same to be checked by PMC/Engineer In-Charge.

30 Force Majeure:

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

- (i) force majeure, or
- (ii) abnormally bad weather, or
- (iii) serious loss or damage by fire, or
- (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 the PMC/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 authority but shall nevertheless use constantly his best endeavours to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the PMC/Engineer In-charge. to proceed with the works.

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GUIDELINES FOR PROPOSAL OF PEB WORKS

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1.0 PEB SPECIFICATION

SCOPE

The specification covers the general requirements and the specific technical requirements for the **Pre-engineered Building works (PEB)**, which are not covered by any of the other component specifications of Civil, works technical document, but are required to be carried out for the satisfactory completion of the work. This specification and the other component technical specifications contained in Civil works technical document are mutually dependent and essential for correct interpretation of the contract. If the requirement of this section and the other technical specifications in Civil works technical document conflict, those of this section shall govern. It should be noted that all Codes of Practice and Standards shall be those of the latest issues.

The following are covered in the scope of PEB work,

- A) For facilitating the design of foundations, CONTRACTOR shall provide all the structural design data to CONSULTANT along with the drawings of anchor bolt location in foundations. Contractor shall supply anchor bolts/ foundation bolts well in advance of schedule for casting of foundations.
- B) The CONTRACTOR shall design the building as per the technical requirements furnished by the consultant in co-ordination with the client. Fabrication & erection will be started only after getting approval on design & drawings from the consultant.
- C) The CONTRACTOR shall be completely responsible for entire structural design, complete fabrication, and transportation to site and safe erection of the building at site, within the estimated time frame. Any approval from the consultant or OWNER will not relieve the CONTRACTOR from the responsibilities for correctness of his designs and drawings.

2.0 REQUIREMENTS OF PROPOSED PRE-ENGINEERED BUILDING:

2.0 Description: The All Requirements shall be as per bid purpose drawings.

- Type:

Tapered / Straight column solid web Steel portal frames & Hot Rolled Sections.

- Frame spacing:

As indicated in the architectural drawings.

- Height:

As indicated in the architectural drawings.

2.1 Bracing System-

A bracing system shall be provided for the columns in the entire building, wherever required as per design. The accesses as demarcated in the general arrangement drawings shall be free of braced bays.

The PEB contractor shall plan the bracing bays and patterns and shall get approval from CONSULTANT before going for detailed engineering.

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Bracing shall be provided for the roof & vertical wherever required as per design.

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3. LOADS: FOR LOAD ON PEB STRUCTURE REFER ANNEXURE – I

4. FOUNDATION & ANCHORAGE:

1. The CONTRACTOR shall provide the structural data for design of foundation to CONSULTANT along with the “Anchor Bolt Setting Plan” & bolt schedules.
2. The CONTRACTOR shall provide all the anchor bolts required for PEB structure along with the matching templates. The PEB contractor shall provide properly oriented and tagged MS templates.
3. To have a concurrence in foundation & superstructure, the CONTRACTOR shall clearly specify their requirements in preliminary stages & shall provide technical assistance to satisfy the foundation requirements as stated by them.

5. STRUCTURAL STEEL WORK

1. Primary members: Primary structural framing shall include the transverse rigid frames, lean- to-rafters and columns, canopy rafters, interior columns (beams and column frames), bearing frame rafters and corner columns and end-wall wind columns.
2. Secondary members: Secondary structural framing shall include the purlins, girts eave struts, wind bracing, flange bracing, base angles, clips and other miscellaneous structural parts.
3. Anchor bolts: All anchor bolts and anchor bolt assemblies shall be designed, detailed, approvals obtained from ENGINEER, supplied, and transported to site (for erection and grouting by others) including threading, provision of nuts, locknuts, washers, pie sleeves, etc. all as per specifications and approved fabrication drawings. All anchor bolts and anchor bolt assemblies shall conform to IS: 2062/ IS: 1367. The grade of reinforced cement concrete for placing the anchor bolts shall be M25 with 20 mm downgraded aggregates.
4. CONNECTIONS: All field connections shall be bolted (Unless otherwise noted). Primary bolted connections shall be furnished with high strength bolts confirming to the physical specifications of ASTM A325 (or equivalent). Secondary bolted connections shall be furnished with machine bolts conform to the physical specifications of ASTM A307 (or equivalent).
5. The auxiliary supports like duct supports and cabling supports, which are not in the scope of the PEB contractor as explicitly defined, provision of pre-defined bolted connections and / or site welded end connections shall be made.

6. CERTIFICATES TO BE SUBMITTED

1. The PEB Contractor shall furnish the manufacturer’s test certificate for structural steel materials prior to starting fabrication in his shop/ facility.
2. The PEB Contractor shall supply manufacturer’s test certificate for the sheeting

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materials and materials for other accessories prior to supply of these materials at site.

7. WARRANTY

1. The PEB Contractor shall provide leak proof warranty on a non-judicial stamp paper for the roof system for a minimum period of 10 (Ten) years for standing seam system and two consecutive rainy seasons for screw down system after total completion of work for screw down system.
2. The CONTRACTOR shall also furnish the warranty for coating provided on the sheeting for perforation, flaking and peel off for a period of 10 years on a non-judicial stamp paper for standing seam and screw down system.
3. The PEB vendor shall furnish the stability certificate for the building structure after erection for a period of 50 years on its letter head.

8. SUBMITTALS REQUIRED FROM PEB VENDOR:

I Along with Bid

A. Technical Data Sheet:

- a) Include manufacturer's specifications for materials, fabrication, installation, and recommendations for maintenance including basic proposal drawings.
- b) Project schedule for the successful completion of works tied into the enclosed overall project implementation schedule.
- c) Load reactions from PEB Vendor for designing the footing.
- d) The vendor shall furnish a sample of the documentation provided by the theme of any similar project executed in the past along with the tender.
- e) Fabrication / Erection tolerances manual
- f) Testing procedure / checklist manual of materials during fabrication.
- g) Mobilization plan
- h) Material storage plan and procedure.
- i) Inspection procedures
- j) Erection method of statement for structure and cladding
- k) Plan for fabrication error and installation
- l) Alignment procedures
- m) Method of statement for water leak test

II After Award of work and before fabrication

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- A. The following must be submitted for design validation:
- a) Structural analysis & design shall be done by PEB contractor using Software like STAAD. Pro 2008 V8i SS6 or as approved by the consultant. All the geometry, load development sheets, analysis and design details shall be furnished to the consultant for verification and approval.
 - b) Design of purlins and side girts, bracing members.
 - c) Seismic Connection designs.
 - d) Civil assignment drawing showing Foundation bolt layout and details along with foundation loads for various load combinations.
- B. Technical Submitting with catalogs
- C. Erection Manual
- D. Safety Manual
- E. Samples: Submit selection and verification samples.
- F. GA drawings: Contractor / vendor shall submit GA drawings for review and approval by the consultants. The fabrication / shop drawings are the responsibilities of the contractor.
- G. Drawings shall include all unit elevations.
- H. Include setting drawings, templates, and directions for the installation of all the components.
- I. Indicate where and how the system deviates from contract drawings and specifications. Provide material properties and other information needed for review.
- J. Vendor to submit to the scale ACAD drawings for the column layout for all the revisions.
- K. During fabrication of the works the Client/ Project manager will inspect the factory for Quality checks.
- L. Fabrication drawings shall include the following:
- a. Structural layout and elevations.
 - b. Sizes of structural members.
 - c. Adequacy of connections and joints.
 - d. Design and details of structural joints for required strength and Erection.

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- e. Type and dimension of welds and bolts.
- f. Shapes and sizes of edge preparation for welding.
- g. Details of shop and field joints included in the assembly

III . During casting of anchor bolts by civil contractor: -

The engineer of the PEB vendor to cross check and certify the location of the bolts for all the pedestals before concreting and sign the checklist and pour cards as directed by engineer-in- charge.

IV. During fabrications: - Check list / test reports of the materials, welding etc.

V. After completion of Work:

1. Contract close out information.
2. Warranty: Project Warranty documents as described herein.
3. As built and Record Documents: Two copies of documents for installed materials hard and soft copies on a CD in accordance with this contract
4. Maintenance Manuals: Submit 2 copies of a maintenance manuals hard & soft copies on a CD to the Owner. The manual shall include schedules for routine inspection, an inspection checklist, instructions for emergency repair and use of emergency repair materials, and warranty.

9. DESIGN VALIDATION BY STRUCTURAL CONSULTANT

The design software used should be STAAD or as recommended by structural consultant. The PEB vendor should submit a DBR clearly mentioning the imposed and lateral loads compliance, load combination cases considered for analysis, compliance's made with respect to the relevant codes and the software (STAAD, ETABS) used for analysis & design. The DBR needs to be got approved by vendors before starting with the analysis.

The analysis and design to be validated by the vendor from the consultant appointed by owner, through interaction and cost towards the same to borne by PEB vendor. The design Engineer appointed by vendor will have to visit consultants office along with the software for its validation, and perform/run the analysis in the presence of the consultants, who will be comparing the results with those obtained through their own analysis. The vendor's analysis will be approved if there is no major variation in the results.

When the erection process is complete the vendor will have to issue a stability certificate for the PEB structure, based on which the consultants would issue the stability certificate of the entire structure.

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It may be noted that certificate issued by the consultants does not absolve the PEB vendors of the adequacy of design & stability of the PEB structure.

Following details are required from PEB vendor for structural analysis and design of pedestal and foundation.

- Design preamble indicating design loads, load combinations and code considered.
- Detailed analysis and design report along with validation of software used by PEB vendor.
- Schematic drawings indicating column locations, girder positions, ties and any other member supporting the PEB structure.
- Details of base plate for each column along with bolt details.
- Governing load cases and combinations for designing of base plate and pedestal foundations.
- Sections indicating various heights of member.
- Any special requirement from PEB vendor if any needs to be considered in design.
- Pedestal top level.

10. FABRICATION SPECIFICATION

10.1 RAW MATERIAL RECEIPT AND STORING

- All steel parts furnished & supplied shall be checked sorted out straightened & arranged as per grades & qualities in stores.
- Structural steel with surface defects such as pitting, cracks , laminations etc, shall be rejected if the defects exceed the allowable tolerances specified in relevant standards or as directed by the engineer-in-charge/Architects/consulting Engineer.

10.2 RAW MATERIAL TESTS

- The contractor shall be required to produce manufacturer's quality certificate for materials supplied by the contractor. Notwithstanding the manufacturer's certificates, the Engineer-in-charge/Architects/Consultant may ask for testing of materials in approved test houses. The test results shall satisfy the requirements of the relevant Indian standards.
- Whenever quality certificates are missing or incomplete or when material quality differs from standard specifications, the contractor shall conduct all appropriate

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tests as directed by the engineer-in-charge/Architects/Consulting Engineer at no extra cost.

- Materials for which test certificates are not available or for which test results do not tally with the relevant standards specifications shall not be used.

10.3 PREPARATION OF MATERIALS

- Prior to release for fabrication, all rolled sections warped beyond allowable limit shall be pressed or rolled straight & freed from twists, taking care that a uniform pressure is applied.
- Minor wrapping, corrugations etc. in rolled sections shall be rectified by cold working.
- The sections shall be straightened by hot working where the architects so direct and shall be cooled slowly after straightening.
- Warped members like plates & flats may be used as such only if wave like deformation does not exceed L/1000 but limited to 10 mm (L-length)
- Surface of members that are to be joined by lap or fillet welding or bolting shall be even so that there is no gap between over lapping surfaces.
- If required, straightening and bending may be done by application of heat between 900°C and 1100°C. Cooling down of the heated item shall be done slowly

10.4 CUTTING

- Members shall be cut mechanically (buy saw or shear) or by oxyacetylene flame. However, all tubes for structural purposes shall be cut by saw only.
- All sharp, rough or broken edges & all edges of joints which are subjected to tensile or oscillation stresses shall be made good by grinding.
- No electric metal arc cutting shall be allowed.
- All edges cut by oxyacetylene shall be cleaned off impurities prior to assembly.
- Cutting tolerance shall be as follows:
 - For members connected at both ends + or -1 mm.
 - Elsewhere + or -1 mm
- The edge preparation for welding of members more than 12 mm thick shall be done Flame cutting & grinding. Cut faces shall not have cracks or be rough.
- Edge preparation shall be as per IS: 823

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10.5 DRILLING

- Bolt holes shall be drilled. Drilling shall be made to the diameter specified in drawings. No enlarging of holes or filling of holes, by man drilling or oxyacetylene flame shall be allowed.
 - Allowed variation for holes (out of roundness, eccentricity plumb line deviation) shall be as per IS 800-2007.
 - Maximum deviation for spacing of two holes on the same axis shall be 0 to 1 mm.
 - Two perpendicular diameter of any oval shall not differ by any more than 1mm.
 - Drilling falters in holes may be rectified by reaming holes to the next upper diameter provided that spacing of new hole center and distances of hole center to the edges of members are not less than allowed and that the increase of hole diameter does not impair the structural strength.
 - Bending of plates, flats and sections shall be carried out on bending rolls or in presses.
- A. Cold bending may be accepted when bending radius is equal or more than:
- 25 times member thickness for plates and flats.
 - 25h or 25b times for rolled steel beams, channels, etc. according to bending plane.
 - 45b for angle. Where 'h' is the section height and 'b' is the flange width.
- B. When bending radius is less than that indicated; bending shall be done on hot metal by heating the member up to 850°C-900°C (light red radiance). Cooling shall be done slowly as directed by Engineer-in- Charge.
- C. Bending shall be discontinued when temperature drops below 500°C.
- D. Accuracy of bending operations shall be checked by means of templates and the profile variation between member and template shall not be more than 1 mm.
- E. Bent members shall not have cracks or deep indentations lining after the process of bending operation

10.6 PREPARATION OF MEMBERS FOR WELDING

- Assembly of structural members shall be made with proper jigs and fixtures to ensure correct positioning of members (angles, nodes etc.)
- Sharp edges, rust of cut edges, notches, irregularities fissures due to faulty

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cutting shall be chopped or ground or filled over the length of the affected area, deep enough to remove faults completely. All steel tubes required for fabrication shall be cut only by a hacksaw/handsaw & shall not be gas so as to facilitate a good joint.

- Generally no special edge preparation shall be required for members under 8 mm thick.
- Edge preparation beveling denotes cutting of the same so as to result in V, X, K, or U scam shapes as per IS: 823
- Welding electrodes of LINCON / ESAB/ADOR to be used.
- All welding is to be in accordance with standard welding standards.
- For continuing the welding of seams discontinued due to some reason, the end of discontinued seam shall be melted in order to obtain a good continuity. Before resuming the welding operation, the groove as well as the adjacent parts shall be well cleaned for a length of approximately 50 mm
- For single butt welds (in V, ½ V or U) and double butt welds (in K, double U, etc.) the re- welding of the root butt is mandatory but only after the metal deposition on the root has been cleaned by back gouging or chipping.
- Welding procedures and Tests for welders shall be conducted as per IS 823 and approved by the Engineer- in-Charge. Dry penetration test to be performed for 10% of overall joint welding of members

10.7 FABRICATION

- Fabrication shall be done as per approved fabrication drawings adhering strictly to work points and work lines on the same. The connection shall be welded or bolted as per design drawing. The work shall also include fabricating built-up sections.
- Any defective material used shall also be replaced by the contractor at his own expenses, care being taken to prevent any damage to the structure during removal.
- All the fabricated & delivered items shall be suitably packed to be protected from any damage during transportation & handling. Any damage caused at any caused at any time shall be made good by the contractor at his-own cost. Any faulty Fabrication pointed out at any stage of work shall be made rectified by the contractor at his own cost.
- All Fabrication tolerance to be as per relevant codes and standard practice followed for such jobs.

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10.8 SURFACE PREPARATION AND PAINTING SPECIFICATION:

- Surface should be done with Standard cleaning and Monocoat of 100 microns to be applied at plant. touch up to be done at site.
- Standard paint Make Akzo Nobel / Asian paints / Berger.
- Manufacturers shall depute their technical representative to inspect and certify the workmanship & quality of the work at every stage.
- The purlins, girt and other cold rolled sections shall be galvanized with min. zinc coating of 275 GSM.

- **Sealant**

Special grade of silicone sealant non-hardening, neutral cure type of Dow corning or GE or approved equivalent make and grade shall be applied at all side laps and end laps (with flowable mastic) as per manufacturer's recommendation and as approved by the Client's Project Manager/Architect.

- **Bead mastic**

Bead mastic is an extruded elastomeric butyl rubber based sealant supplied in rolls on silicon release paper conforming to Federal specification TT-C-1796 A Type II Class B (or equivalent)

- **Flowable mastic (Caulking sealant)**

Flowable mastic (Caulking sealant) is a neutral cure silicone rubber sealant that is chemically inert and non-corrosive. It is UV resistant and suitable for exterior applications against weathering and rainwater. When cured it is non-toxic and will accommodate high thermal and shrinkage changes in structural movement joints.

- **Foam closures**

Foam closures match the panel profile. They are made of expanded polyurethane or similar material.

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10.9 FASTENERS

- All fasteners used for connecting primary members shall confirm to IS: 1364, PC 8.8 grade.
- All fasteners used for connections of secondary framing members shall be of PC 4.6 grade confirming to IS: 1363 or equivalent.
- Steel sheets shall be fixed with hexagonal head self-drilling, self-taping screws of ITW Build Ex (Class 3, Class4) with EPDM seals. Fasteners shall be 45 microns thickness zin tin alloy plated and confirm to AS
- 3566 class 3. Make for self-taping screws shall be ITW Build Ex (Class 3, Class4)
- All fasteners shall be procured from M/s GKW / TVS/DFL
- All foundation bolts shall be provided with pipe sleeve of 200mm long, Nut - PC 8.8 grade, Check
- Nut & two washers - to be specified by PEB vendor
- **Erection and Installation**
 - Installation shall be done in accordance to the standard practices as specified by the manufacturer and as approved by the Client's Project Manager / Architect. All sheets and accessories must be stored and finally erected without any damage.
 - The Vendor will be required to submit design calculations in support of the proposed profile of the sheet and standard loading etc. to the satisfaction of the design consultant and the Architect. The Vendor shall also submit a methodology for fixing and also maintenance.
- **Manual for routine maintenance.**
 - Special flashing, ridge capping and trims shall be fixed as per manufacturer's recommendation. The shape and grits shall be as per design requirement and shall be approved by the Client's Project Manager / Architect.
 - The Vendor shall ensure that panel erector is familiarized with the erection procedure and the supporting members are straight, level and true (according to code) before starting panel erection. Panels shall be erected according to approved shop drawings by the Architects.

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11 PACKING AND FORWARDING

- 11.1 The vendor shall ensure that all the materials shall be packed properly and dispatched to avoid any damage to the materials during transportation.
- 11.2 All components / assembly of PEB shall be suitably prepared and packed for transportation on road and open yard storage conditions at site. The packing should protect the components against corrosion, dampness, and breakage or vibration injury during transportation & storage until installation.
- 11.3 All major items, loose parts and accessories shall be packed in one case. All loose material shall be identified with a main item code & part list also to be provided with codes for easy identification.
- 11.4 Each part shall be packed in appropriate packing material.
- 11.5 Each consignment shall be identified with the contents, purchase order number and item number. When components have been split for transportation, proper match marking and correlation should be provided for easy identification at site.
- 11.6 Each consignment shall mention the weight of the components. Wherever required "Handle with Care" instruction shall be mentioned on the consignment with top side arrow markings.
- 11.7 Lifting lugs shall be provided & lifting locations shall be marked clearly on each consignment for safe and easy handling during transportation & storage. All the consignment shall be properly sized for ease of transportation.

12 UNPACKING AND HANDLING AT SITE

- 12.1 Vendor shall ensure that their site supervisor reaches site before arrival of consignment at site. Vendor's site supervisor shall receive material at site. Vendor shall unpack the received consignment at site. Vendor shall report any shortage / damage to site engineer & their office for necessary replacement. Vendor shall take action for replacement and report to the owner.
- 12.2 Vendor shall make necessary arrangement for the stay of his / her workman nearby.
- 12.3 Vendor shall arrange for labor license and workmen insurance policy.
- 12.4 Vendor shall arrange for necessary safety gadgets (Mandatory are safety shoes, safety belts, helmets) for their workmen.
- 12.5 Vendor shall be responsible for handling of the canopy and it's accessories at site.
- 12.6 Vendor shall clear all packing material and debris generated at site during the course of unpacking and Installation.
- 12.7 The parts shall be unloaded, sorted and stored so as to be easily identified.

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- 12.8 The parts shall be stored according to construction symbol and markings so that these may be taken out in order of erection.
- 12.9 The parts shall be set at least 150 mm clear from ground on wooden or steel blocks for protection against direct contact with ground and to permit drainage of water.
- 12.10 If rectification of members like straightening etc. are required, these shall be done in a special place allotted which shall be adequately equipped.
- 12.11 The parts shall be clean when delivered for erection.

13 PEB ERECTION AT SITE

- 13.1 Contractor shall prepare and submit detail erection method statement giving details of sequence of erection, Manpower, tools and tackles required for erection to Owner for review.
- 13.2 On receipt of materials at site, vendor shall take possession of all materials and commence erection activity, subject to readiness of site.
- 13.3 Contractor shall make arrangement of lifting tools and tackles including crane if required for erection. Contractor shall provide all safety gears (Mandatory are safety shoes, safety belts, helmets, guy ropes, wooden battens etc. in sufficient quantity) for their workmen at site.
- 13.4 Before starting the erection of PEB, contractor shall ensure the foundation casted by civil contractor is checked and is as detailed in drawing. Preferably a joint protocol shall be made by engineer in charge, contractor representative and civil contractor.
- 13.5 Fabrication and erection tolerances shall confirm to best engineering practices.
- 13.6 Positioning and leveling of the structure, alignment and plumbing of the stanchion and fixing every member of the structure shall be in accordance with the relevant drawings and to the complete satisfaction of the Engineer-in-Charge.
- 13.7 The following checks and inspection shall be carried out before, during and after erection:
- Damages during transportation.
 - Dimensional check of all members
 - Accuracy in alignment of structures.
 - Erection according to drawings and specifications.
 - Progress and workmanship.
- 13.8 In case there are any deviations regarding positions of foundations, or anchor bolts, which would lead to erection deviations, the Engineer-in-Charge shall be informed immediately. Minor rectifications in foundations, orientation of

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bolt holes etc. shall be carried out as a part of the work, at no extra cost.

- 13.9** The various parts of the steel structure shall be so erected as to ensure stability against inherent weight, wind and erection stresses.
- 13.10** The structure shall be anchored and final erection joints completed after plan and elevation positions of the structural members have been verified with corresponding drawings and approved by the Engineer-in- Charge.
- 13.11** The bolted joints shall be tightened so that the entire surface of the bolt heads and nuts shall rest on the member. For parts with sloping surfaces, tapered washers shall be used.

14 SAFETY MEASURES & ERECTION PRACTICES TO BE FOLLOWED:

a	Lifeline during erection of structural steel	Lifeline of 12 mm steel wire rope shall be used for fall protection.
b	Use of boom lift	All height work will be carried out only with boom lift / scissor lift. Boom lift should have working platform and it should not be only a access platform. Use of Mobile scaffolding is strictly prohibited. No any sub-standard method e.g. ladder/ scaffolding or any other means will be used. Height work area must be barricaded properly and signage should be displayed in well manner.
c	Personal protective equipment	All the people working at site should have personal protective equipment which includes helmets, high visibility jackets, hand gloves, full body harness with double lanyard and shock absorber, guy ropes. All the belts, steel ropes, shackles etc. to be used at site for lifting of materials must be certified by third party agency and must be valid.
d	Use of Crane	Preferably Cranes or F15/Farana only should be used for erection. All operators must have a minimum of 5 years of experience. The cranes must have valid Insurance and Pollution certificate. The cranes must have load switch, reverse horn, safety latch on hook, lights etc. for operating in safe condition.
e	Site office and store	Container should be used for site office and store. There should be two separate containers for office and store.

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15 SITE INSTALLATION, INSPECTION AND CERTIFICATION

- 15.1 Water levels and plumb levels shall be ensured while PEB installation at site.
- 15.2 Contractor shall co-ordinate with site in-charge for allocation of proper space for preserving his tools and tackles. Contractor shall adhere to the procedures laid down by site in-charge regarding material receipt, material return and it's possession at site.
- 15.3 Contractor shall discuss and agree with site in-charge the erection sequence and milestones that site in-charge would like to witness.
- 15.4 Contractor shall keep record of all inspection reports at site and take approval signature of site-in-charge from time to time. During installation of PEB / casting of foundation Owner's representative shall carry out random inspection.
- 15.5 After complete structure is erected and all levels are checked by Owner, foundation bolts shall be grouted suitably.
- 15.6 After satisfactory completion of job at site, contractor shall obtain completion certificate from the owner.
- 15.7 Contractor shall have work compensation **insurance** policy for its workmen at site.

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Material Specification: -

No.	Structural Components		Specifications	Yield Strength
1	Built - up sections		ASTM A572M Grade 50 Type 1	Fy = 345
2.	Hot Rolled Sections	I- Sections	IS 2062	Fy = 250
		Channels	IS 2062	Fy =250
3	Cold formed secondary members		ASTM A 653 Gr.50 ,GI(275 GSM)	Fy = 345
4	ROOF SHEETING		ASTM A 792M Grade 300	Fy = 345
5	WALL SHEETING		ASTM A 792M Grade 550	Fy = 550
6	Mezzanine Deck panels		ASTM A653M Grade 340 class 1 : coating Z275	Fy = 345
	Diagonal „x“Bracing	Rods	IS 2062	Fy = 345
		HR Angles	IS 2062	Fu= 402
8	Anchor Bolts		Hot Rolled bar per Grade 4.6 IS 2062	Fy = 345
9	High Strength Bolts		ASTM A 325 M = Bolts ASTM A 563 M = Nuts	Ft= 303
10	Sag Rods for Walls & Sag Pipe for Roof		Hot rolled bar per IS 2062	Fy = 345
Fy= Yield Strength. Fu = Ultimate Tensile Strength.				

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DESIGN LOADS AND CODES (ANNEXURE – I)

- Design of Primary Members as per IS 800:2007
- Design of Secondary Members as per AISI 2012.
- Indian Standard Code of Practice for Dead Loads Part – 1, 2 (IS: 875 – 1987)
- Indian Standard Code of Practice for Wind Load as per Part – 3 (IS: 875 – 2015)
- Indian Standard Code of Practice for Seismic Loads (IS: 1893 – 2016)

13	Mezz floor	<ul style="list-style-type: none"> • Mezz structure should be Designed for specified loads. Structure beam/ formed steel deck and share studs should be designed as per composite or Non-composite flooring. • Floor concrete thickness should be considered 150 mm. • There should not any gap between the mezz floor and building PEB wall. • Egde angle should be considered at the edge of the mezz. • Clear Bottom of mezz beam should be min 5 mts from FFL. • 1.2 M high handrail with toe guard to be considered at mezz periphery.
14	Mezz Staircases	Staircases should be finished in paint finish as per specification.
15	Expansion Joint	As per vendor requirement.
16	Anchor Bolt	Anchor bolts shall be fabricated from rods conforming to ASTM A 36M G250 or IS:2062 Gr A or equal with a minimum yield stress of 235 N/Sq.mm.
17	High strength bolt for primary as well as secondary connection	High Strength Bolts (HSB) are plain galvanized (Electroplated) finish, fully threaded and are identifiable by marks on the bolt head. HSB are provided with flat washers. HSB conform to ASTM A 325M Type 1 or (Grade - 8.8 or as deemed necessary basis design).
18	Steel Column Base Conditions	As per vendor designer.
19	Anchor bolts, base plates & stiffeners	All anchor bolts, base plates and stiffener shall be embedded with the concrete and not to be seen at floor levels.

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20	Surface preparation and Paint specs	<p>Surface should be done with Standard cleaning and Monocoat of 100 microns to be applied at plant. touch up to be done at site.</p> <p>Standard paint Make Akzo Nobel / Asian paints / Berger.</p> <p>Manufacturer shall depute their technical representative to inspect and certify the workmanship & quality of the work at every stage.</p> <p>The purlins, girt and other cold rolled sections shall be galvanized with min. zinc coating of 275 GSM.</p>
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Roof System:

1	Purlin Section (Minimum Thickness as per design calculation and Maximum spacing 1.4m c/c.)	As per design, by pass type (Rafter flange bracing permitted)
2	Purlin - Material and Finish	Pre-galvanized 275 GSM; Galvanized coils to be used. Use of imported steel not allowed. Purlins to have pre- punched holes of 16mm dia at every 1.35 m interval.
3	Sheeting Profile	Standing seam profile width 400-500 mm standing seam, bare Galvalume.
4	Thickness of Sheet	0.55 mm (TCT, G-345 MPa)
5	Sheeting Fasteners	ITW buildex make, Class 3 or class 4 with EPDM washer.
6	Insulation	Super polynum 8mm thick double side aluminum foil reflective insulation (bubble wrap)- R value 3.7 m ² K/W min.
7	Roof Monitors	Should be designed for 6 air changes and protection against rain draft entry.
8	Gutters	Eve gutters shall be cold formed and same material as wall panels. Valley gutter shall be made of GI- minimum 2mm thick

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Wall System

1	Girt Section (Minimum Thickness should be as per design calculations and Maximum spacing 1.4m c/c/Nothing mentioned)	As per design, bypass type (Column flange bracing permitted)
2	Girt - Material and Finish	Pre-galvanized 275 GSM
3	Thickness Of Sheet	0.5mm TCT (G-550MPa)
4	Sheeting Fasteners	ITW buildex make, Class 3 or class 4 .
6	Insulation	Super polynum 8mm thick double side aluminum foil reflective insulation (bubble wrap)- R value 3.7 m ² K/W min.

Schedule of Deliverables:

- 1) **Supply of 100% PEB material on site**
- 2) **Erection works schedule**

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WEIGHT BREAKUP ANNEXURE- II

To be filled by PEB vendors

Component	Weight (MT)	Area (Sq.m)
Primary members (Columns and rafter only)		
Secondary members		
Roof and side purlin/Girt		
Roof sheeting		
Wall sheeting (External sheet)		
Roof Insulation		
Wall Insulation		
Accessories and others (Rafter flange bracing, Gutters, Down take pipes, Ladders, Bolts, Fasteners).		
Total (MT)		

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SCHEDULE OF DEVIATION ANNEXURE– III

To be filled by PEB vendors

Sr. No.	Tender Item	Description of Deviation
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

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ANNEXURE – IV

Deflection Limitations:

The deflection criteria recommended in relevant IS codes or equivalent is to be filled by the Vendor.

HORIZONTAL DEFLECTIONS :			
No.	For Member (or) Element	Maximum Allowable Design Deflection (To be filled by vendor)	Load cases (To be filled by vendor)
1.	Rigid frame rafters with partly sheeted walls		
	Wall Panels		
	Wall girts		
2.	Wind columns		

VERTICAL DEFLECTIONS :			
No.	For Member (or) Element	Maximum Allowable Design Deflection (To be filled by vendor)	Load cases (To be filled by vendor)
1.	Rigid frame rafters with partly sheeted walls		
2.	Mezzanine beams & joists		
3.	Roof Panels		
4.	Roof Purlins		

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ANNEXURE – V

STRUCTURAL DESIGN BRIEF – PRE-ENGINEERED BUILDING (PEB) JHU ADMIN EXTENSION (PORTA STRUCTURE)

a. Project Location

Jamia University, Delhi, India

b. Design Scope

The scope includes the structural analysis and design of a Pre-Engineered Building (PEB) structure, including all primary frames, secondary members (purlins, girts), and bracing systems. Design will also include connection locations and member sizing as per applicable Indian Standards. A complete STAAD.Pro model and design calculation report with Steel Structural drawings will be provided for peer review and vetting.

c. Codes and Standards to be Followed

- IS 800:2007 – General Construction in Steel (Limit State Method)
- IS 875 (Part 1):1987 – Dead Loads
- IS 875 (Part 2):1987 – Imposed (Live) Loads
- IS 875 (Part 3):2015 – Wind Loads
- NBC 2016 – National Building Code of India
- IS 801 – Cold-formed light gauge sections (for purlins and girts)
- SP:6(6) – Handbook for Structural Engineers (Steel)

- Dead Load: Self-weight of structure + permanent fixtures
- Live Load: As per IS 875 Part 2, based on intended occupancy
- Collateral Loads for services – 0.5 KN/m²
- Wind Load: As per IS 875 Part 3 (Delhi wind zone, terrain category, importance factor as per Code)
- Seismic Load: As per NBC 2016 and IS 1893:2016
- Temperature Load

d. Load Combinations

Structural Design will consider only Indian Standard combinations as per IS 800:2007 (Limit State Method), including combinations of DL, LL, WL, and seismic loads as per Indian Standards only.

e. Structural Modeling

A full STAAD.Pro model will be prepared, including:

- Primary frames (columns, rafters, beams)
- Secondary members (purlins, girts, eave struts)/ Can be designed in Separate Shareable Excel Files
- Wind bracings and longitudinal bracings
- Load application and support conditions.

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- Member properties and assignments
- Load combinations and results output

a. Deliverables

- STAAD model file (.std)
- Design report of Main Structure and Connection Details (PDF format) with Load calculations as per Indian standards
- Native Excel Files for calculation of Connections, Purlins, girts etc.
- Structural GA drawings including connection details
- Bill of quantities (BOQ) for structural steel
- Purlin and Girts design Calculations
- Reactions shall be provided for the civil Design of Foundations.

b. Notes

- All designs shall strictly follow the Indian codes only.
- No international standards or mixed code design shall be used.
- Stress Ratio for all columns, rafters, beams & bracings shall be limited to 0.95.
- All Column (Incl Mezzanine Columns) Base Plate Stiffeners; Base Plate and Anchor Bolts should not be visible above FFL. The same should be embedded in the Flooring Concrete.
- The Location of the wall light in the side walls shall be as per the Architecture.
- The wall-lighting shall be made of "Diffused FRP or Fiber Reinforced Plastic" sheet material only.
- The roofing system shall be a "Standing Seam" roof system to ensure that the roof is leak-proof
- All Purlins to have 12mm dia holes @ 1.5 meters c/c to facilitate supporting of the MEP services.
- The strength & Leak Proof of the roof shall be certified by the developer through independent tests from competent agencies for the load-bearing capacities & Leak Proof.
- Please ensure access to the Eave Side Gutters is provided.
- Rainwater downpipes shall be external to the building and connected to the drainage system. Under no circumstances can the rainwater gutters be inside the Building.
- Roof Test Certificate for No Leakage and Structure Stability Certificate for Code Compliance to Indian standards will be required.
- There shall be no wind-bracings or tie-beams within the building area. Wind bracings shall be provided on the side-walls or on the Roof Only.
- All Roof and Wall Side Metal claddings have to be insulated. Insulation to be Bonded Fiber Glass Wool Insulation having a density of 24 kg/cu.m, 75mm thickness.
- Insulation material shall be non-combustible, non-toxic, chemically inert, and free from impurities.
- All structural steel members shall be shot blasted conforming to Swedish Standard SIS-05-5900 with Sa2.5 finish and given one coat (35 micron) of zinc phosphate primer and 1 coat (35 micron) of synthetic enamel paint at the plant. One coat (35 micron) of Synthetic Enamel Paint shall be done at the site after erection.
- All connection bolts shall be of grade 8.8.

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DRAWINGS, BOQ & LIST OF APPROVED MAKES

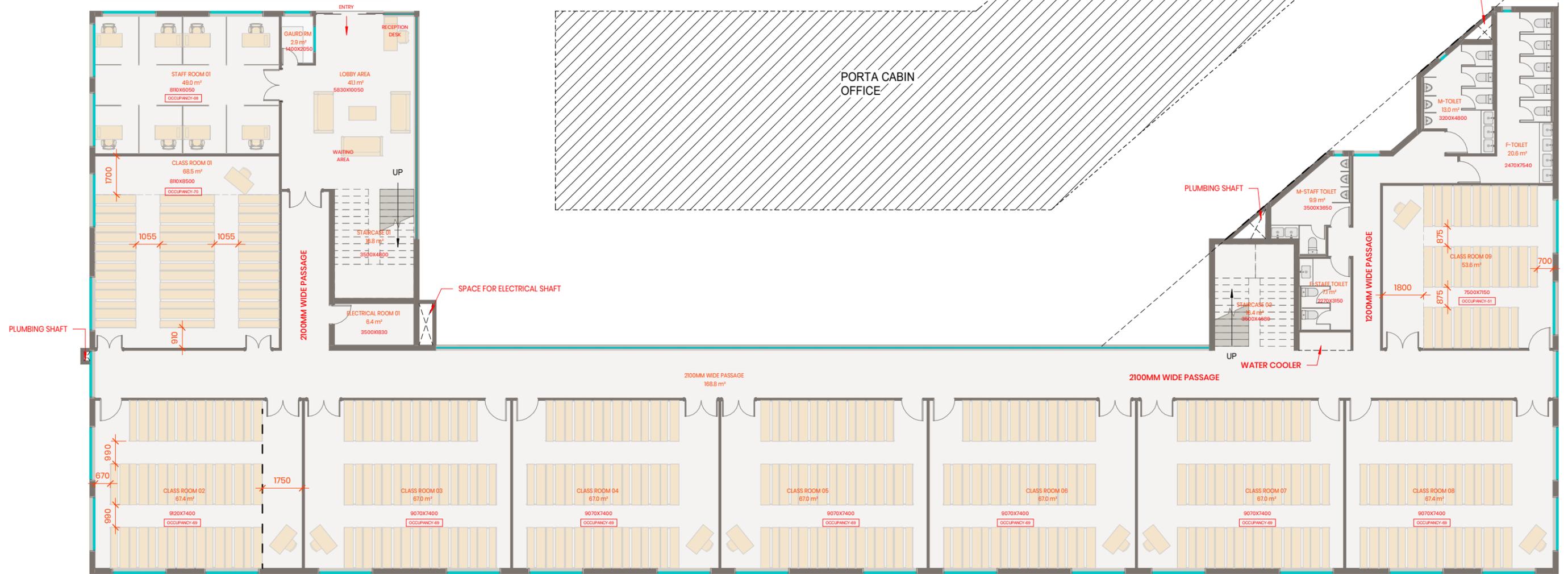
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AREA STATEMENT		
Name	Area (SQ.M.)	Occupancy
2100MM WIDE PASSAGE	168.8	0
2100MM WIDE PASSAGE	172.4	0
CLASS ROOM 01	68.5	70
CLASS ROOM 02	67.4	69
CLASS ROOM 03	67.0	69
CLASS ROOM 04	67.0	69
CLASS ROOM 05	67.0	69
CLASS ROOM 06	67.0	69
CLASS ROOM 07	67.0	69
CLASS ROOM 08	67.4	69
CLASS ROOM 09	53.6	51
CLASS ROOM 10	68.8	70
CLASS ROOM 11	67.4	69
CLASS ROOM 12	67.0	69
CLASS ROOM 13	67.0	69
CLASS ROOM 14	67.0	69
CLASS ROOM 15	67.0	69

AREA STATEMENT		
Name	Area (SQ.M.)	Occupancy
CLASS ROOM 16	67.0	69
CLASS ROOM 17	67.4	69
CLASS ROOM 18	53.6	51
ELECTRICAL ROOM 01	6.4	0
ELECTRICAL ROOM 02	6.4	0
F-STAFF TOILET	7.1	0
F-STAFF TOILET	7.1	0
F-TOILET	20.6	0
F-TOILET	20.6	0
GAURD RM	2.9	0
LOBBY AREA	41.1	0
M-STAFF TOILET	9.9	0

AREA STATEMENT		
Name	Area (SQ.M.)	Occupancy
M-STAFF TOILET	9.9	0
M-TOILET	13.0	0
M-TOILET	13.0	0
MUMMTY 01	22.1	0
MUMMTY 02	20.8	0
STAFF ROOM 01	49.0	8
STAFF ROOM 02	84.3	14
STAIRCASE 01	16.8	0
STAIRCASE 01	22.1	0
STAIRCASE 02	16.4	0
STAIRCASE 02	16.2	0
Grand total	1931.2	1230



1 GROUND FLOOR
1 : 125 (AREA: 1015 SQ.M.)

NOTES:

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- CONTRACTOR TO CONFIRM ALL FINISHES & MATERIALS WITH BUILTEN PRIOR TO APPLICATION.

REV. NO.	DESCRIPTION	DATE

KEY PLAN



SERVICES CONSULTANT

MAIN CONTRACTORS

CLIENT/PROJECT NAME

JHU PORTA
PROPOSED LAYOUT
GROUND FLOOR LAYOUT

PROJECT NO.	JHU_19
SHEET ISSUE DATE	14.02.2026
DRAWN BY	D.K.
CHECKED BY	Y.S.
REVISION DATE	
SCALE	1:125
SHEET STATUS	SCHEMATIC DESIGN

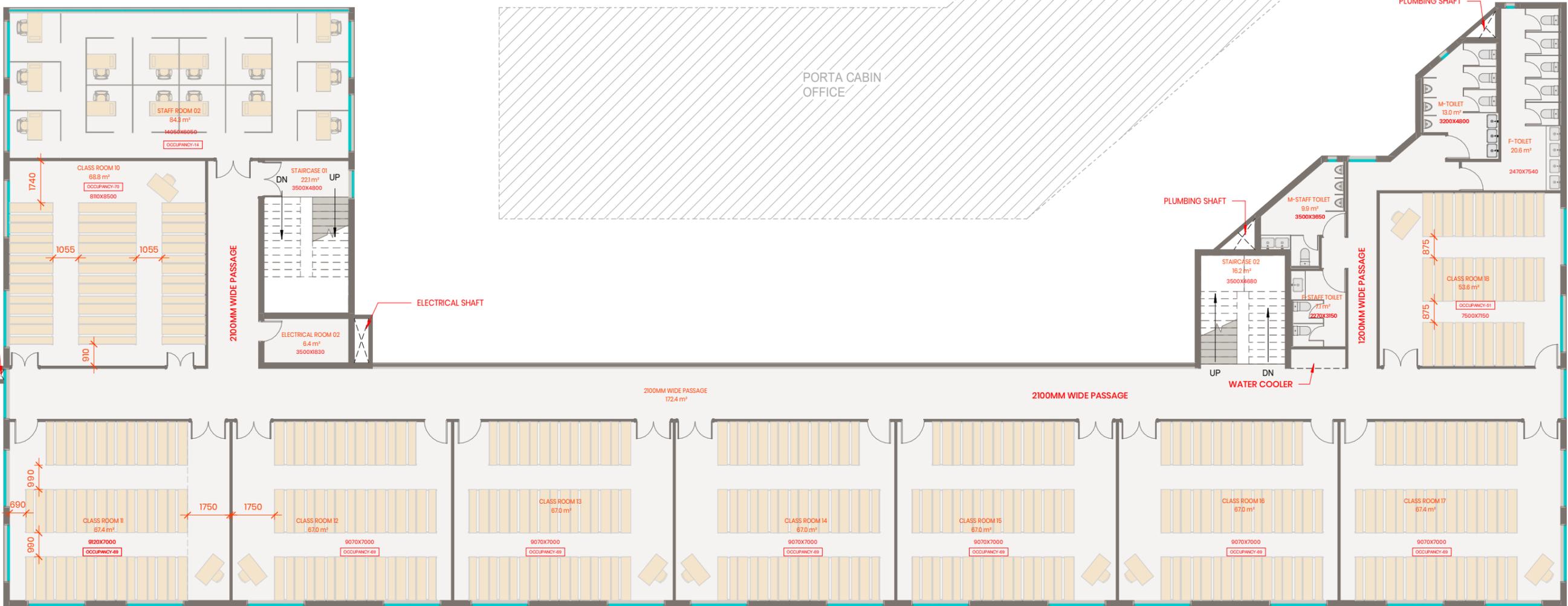
A
101
R
SHEET SIZE-A2

PROJECT DATE 14.02.2026

AREA STATEMENT		
Name	Area (SQ.M.)	Occupancy
2100MM WIDE PASSAGE	168.8	0
2100MM WIDE PASSAGE	172.4	0
CLASS ROOM 01	68.5	70
CLASS ROOM 02	67.4	69
CLASS ROOM 03	67.0	69
CLASS ROOM 04	67.0	69
CLASS ROOM 05	67.0	69
CLASS ROOM 06	67.0	69
CLASS ROOM 07	67.0	69
CLASS ROOM 08	67.4	69
CLASS ROOM 09	53.6	51
CLASS ROOM 10	68.8	70
CLASS ROOM 11	67.4	69
CLASS ROOM 12	67.0	69
CLASS ROOM 13	67.0	69
CLASS ROOM 14	67.0	69
CLASS ROOM 15	67.0	69

AREA STATEMENT		
Name	Area (SQ.M.)	Occupancy
CLASS ROOM 16	67.0	69
CLASS ROOM 17	67.4	69
CLASS ROOM 18	53.6	51
ELECTRICAL ROOM 01	6.4	0
ELECTRICAL ROOM 02	6.4	0
F-STAFF TOILET	7.1	0
F-STAFF TOILET	7.1	0
F-TOILET	20.6	0
F-TOILET	20.6	0
GAURD RM	2.9	0
LOBBY AREA	41.1	0
M-STAFF TOILET	9.9	0

AREA STATEMENT		
Name	Area (SQ.M.)	Occupancy
M-STAFF TOILET	9.9	0
M-TOILET	13.0	0
M-TOILET	13.0	0
MUMMTY 01	22.1	0
MUMMTY 02	20.8	0
STAFF ROOM 01	49.0	8
STAFF ROOM 02	84.3	14
STAIRCASE 01	16.8	0
STAIRCASE 01	22.1	0
STAIRCASE 02	16.4	0
STAIRCASE 02	16.2	0
Grand total	1931.2	1230

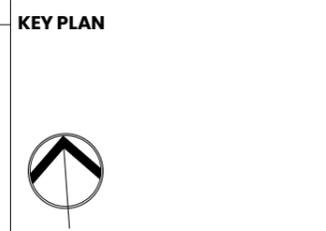


1 **FIRST FLOOR**
1 : 125 (AREA: 980 SQ.M.)

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4. CONTRACTOR TO CONFIRM ALL FINISHES & MATERIALS WITH BUILTEN PRIOR TO APPLICATION.

REV. NO.	DESCRIPTION	DATE



DESIGN CONSULTANT / ARCHITECTS
built en
ARCHITECTURE INTERIOR | EIM

SERVICES CONSULTANT

MAIN CONTRACTORS

CLIENT/PROJECT NAME
JHU PORTA

SHEET NAME
FIRST FLOOR LAYOUT

PROJECT NO.	JHU_19
SHEET ISSUE DATE	14.02.2026
DRAWN BY	D.K.
CHECKED BY	Y.S.
REVISION DATE	
SCALE	1:125
SHEET STATUS	SCHEMATIC DESIGN

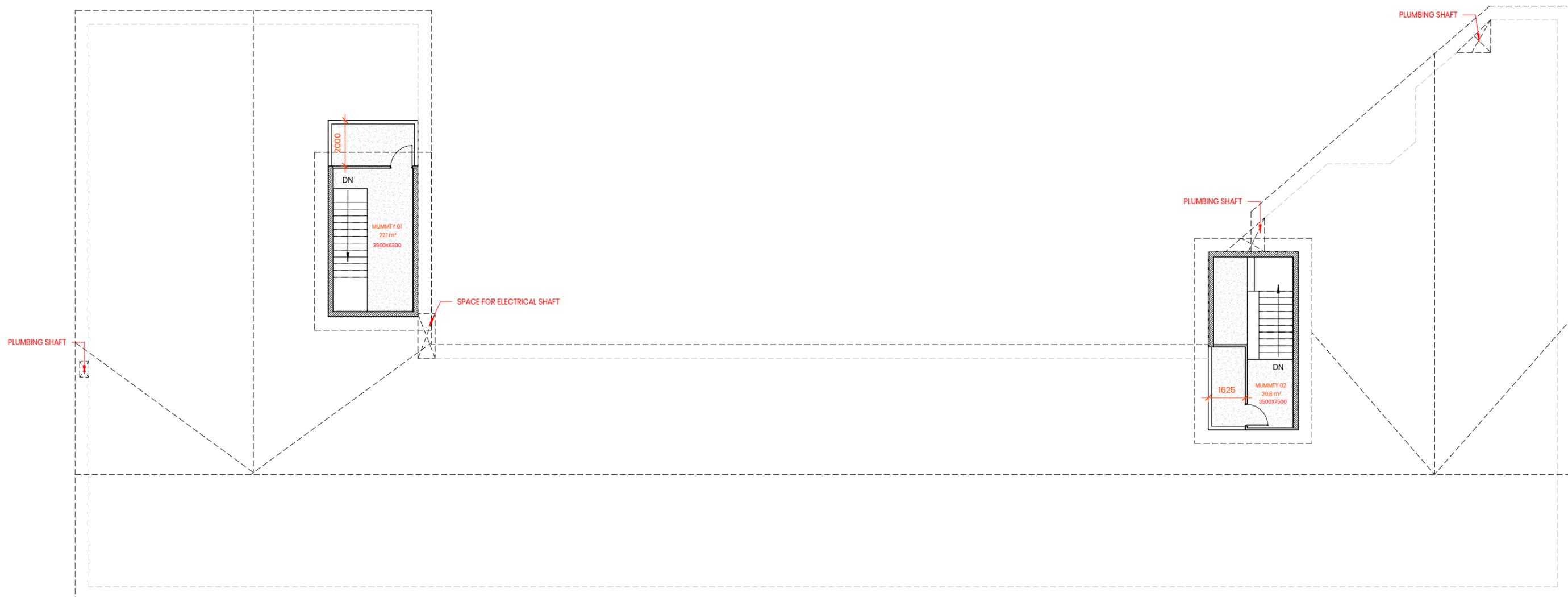
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102

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SHEET SIZE-A2

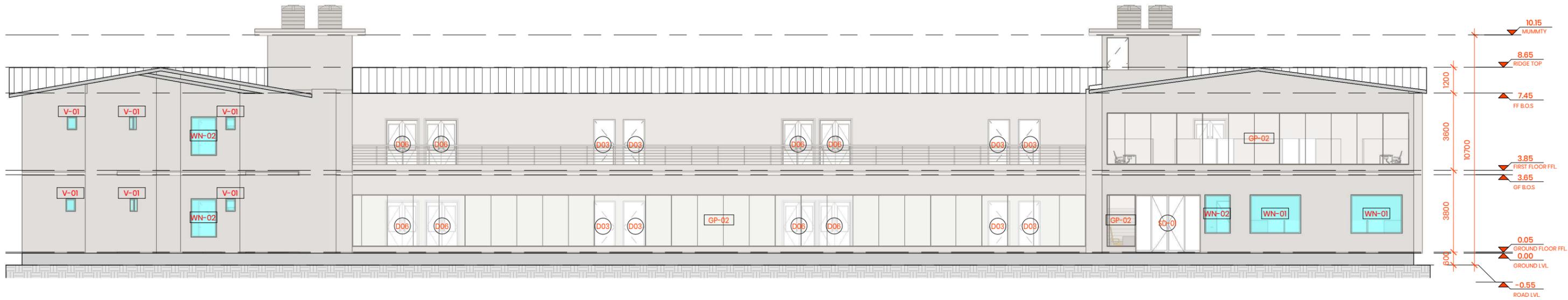
PROJECT DATE
14.02.2026



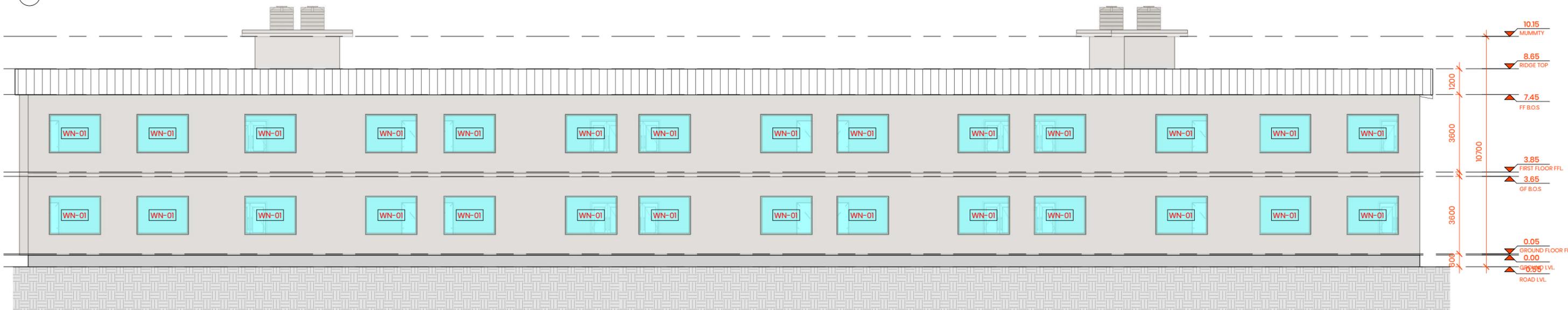
2 MUMMT LAYOUT
1 : 125

(AREA: 980 SQ.M.)

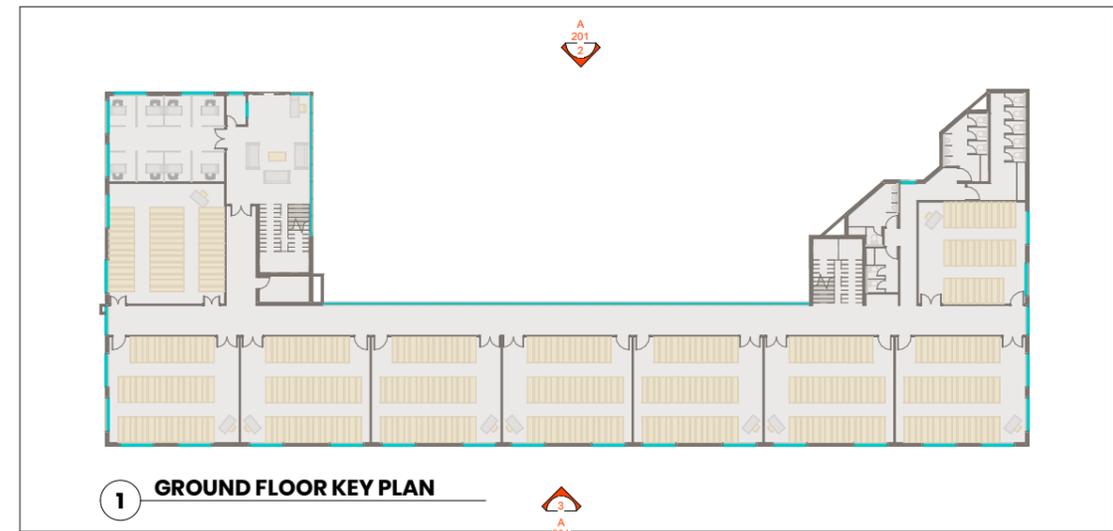
NOTES: THIS DOCUMENT IS AN INTELLECTUAL PROPERTY OF BUILTEN. THIS DRAWING CANNOT BE COPIED, REPRODUCED, RETAINED OR DISCLOSED TO ANY UNAUTHORISED PERSON. ALL DIMENSIONS AND FINAL FINISHES TO BE SUBJECT TO CHECKING AND APPROVAL. DO NOT SCALE OFF DRAWING. FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO THOSE SCALED. DIMENSIONS TO BE VERIFIED ON SITE.	DRAWING NOTES:- 1. CONTRACTOR MUST VERIFY & CHECK ALL DIMENSIONS, DRAWINGS, DETAILS AND SPECIFICATIONS ON SITE AND REPORT ANY ERROR AND DISCREPANCIES TO BUILTEN BEFORE PROCEEDING TO WORK. 2. ALL DIMENSIONS / LEVELS MENTIONED IN THE DRAWING ARE BASED ON THE SURVEY DRAWINGS. CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION. 3. ALL DIAGRAMMATIC REPRESENTATIONS OF FIXTURES IN DRAWINGS BY BUILTEN ARE FOR REPRESENTATION PURPOSE ONLY AND ARE NOT SPECIFIC TO INDIVIDUAL FIXTURES. 4. CONTRACTOR TO CONFIRM ALL FINISHES & MATERIALS WITH BUILTEN PRIOR TO APPLICATION.	REV. NO.	DESCRIPTION	DATE	KEY PLAN 	DESIGN CONSULTANT ARCHITECTS ARCHITECTURE INTERIOR EIM SERVICES CONSULTANT	MAIN CONTRACTORS	CLIENT/PROJECT NAME JHU PORTA PROPOSED LAYOUT	PROJECT NO. JHU_19	A 103 R	PROJECT DATE 14.02.2026
									SHEET NAME TERRACE LAYOUT		



2 ELEVATION A



3 ELEVATION B



1 GROUND FLOOR KEY PLAN

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REV. NO.	DESCRIPTION	DATE

KEY PLAN



DESIGN CONSULTANT ARCHITECTS



SERVICES CONSULTANT

MAIN CONTRACTORS

SHEET NAME
CLIENT/PROJECT NAME

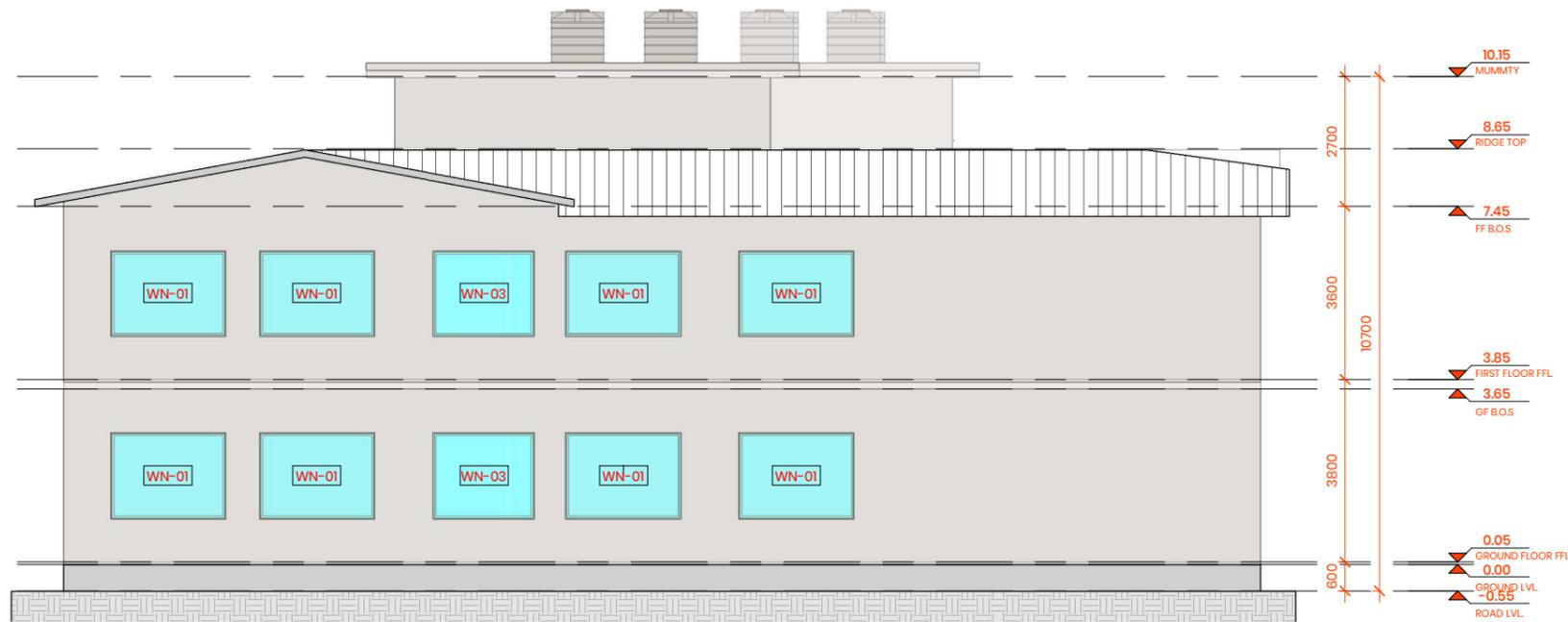
JHU PORTA
PROPOSED LAYOUT
EXTERIOR ELEVATION

PROJECT NO.	JHU_19
SHEET ISSUE DATE	23.02.2026
DRAWN BY	D.K.
CHECKED BY	Y.S.
REVISION DATE	
SCALE	As indicated
SHEET STATUS	SCHEMATIC DESIGN

A
201
R

SHEET SIZE-A2

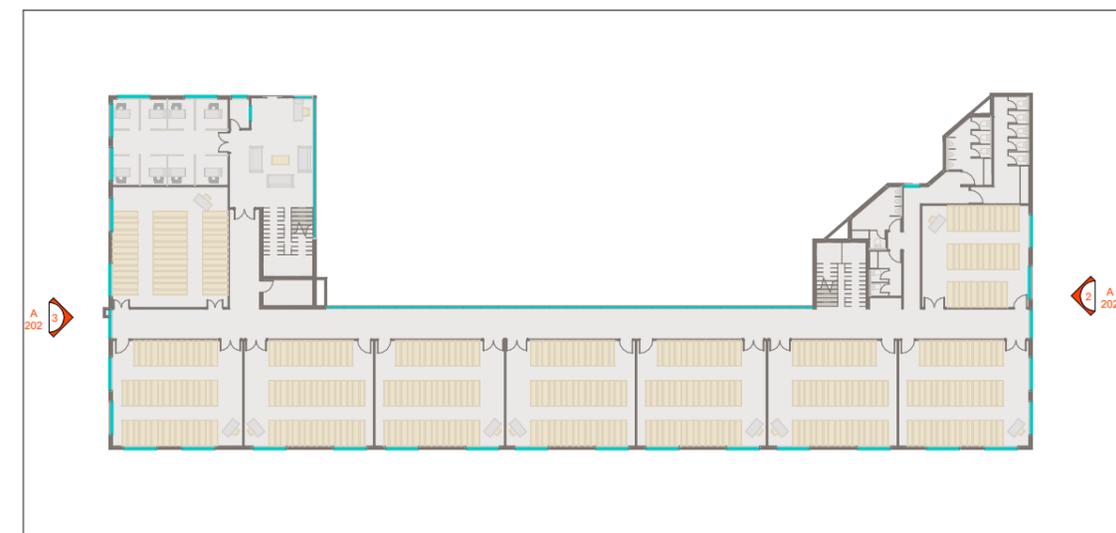
PROJECT DATE
14.02.2026



2 ELEVATION C



3 ELEVATION D



1 GROUND FLOOR KEY PLAN.

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REV. NO.	DESCRIPTION	DATE

KEY PLAN



DESIGN CONSULTANT ARCHITECTS
builten
ARCHITECTURE INTERIOR | BIM
SERVICES CONSULTANT

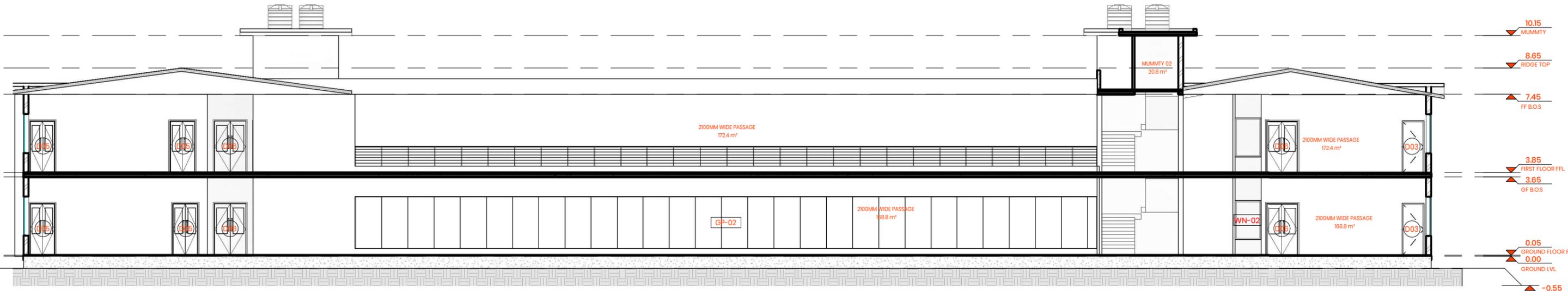
MAIN CONTRACTORS

CLIENT/PROJECT NAME
JHU PORTA
PROPOSED LAYOUT
EXTERIOR ELEVATION

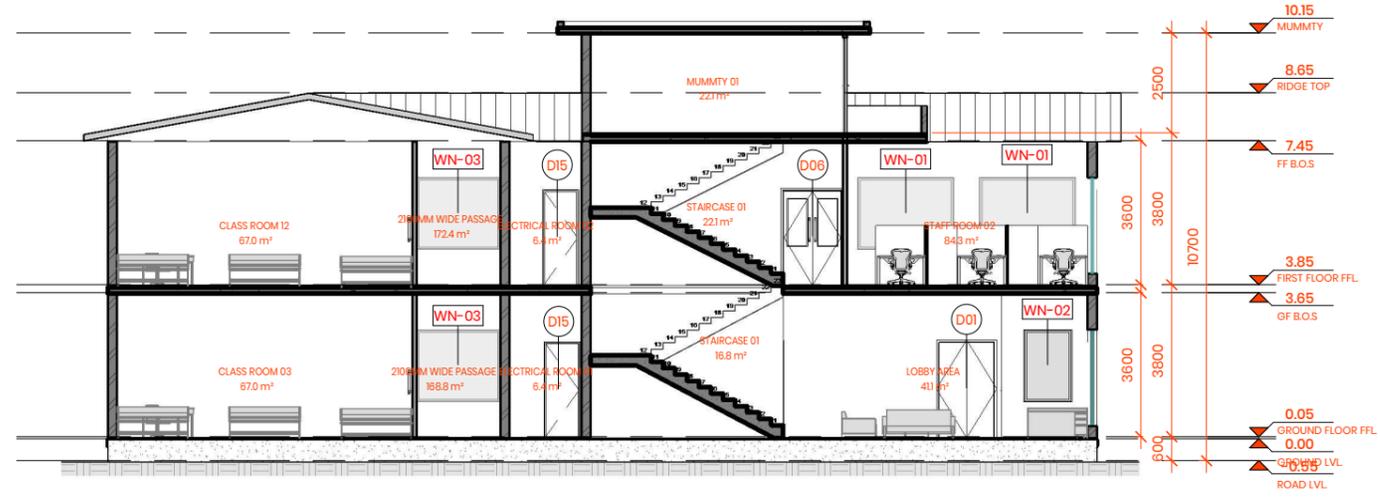
PROJECT NO. **JHU_19**
SHEET ISSUE DATE **23.02.2026**
DRAWN BY **D.K.**
CHECKED BY **Y.S.**
REVISION DATE
SCALE **As indicated**
SHEET STATUS SCHEMATIC DESIGN

A
202
R
SHEET SIZE-A2

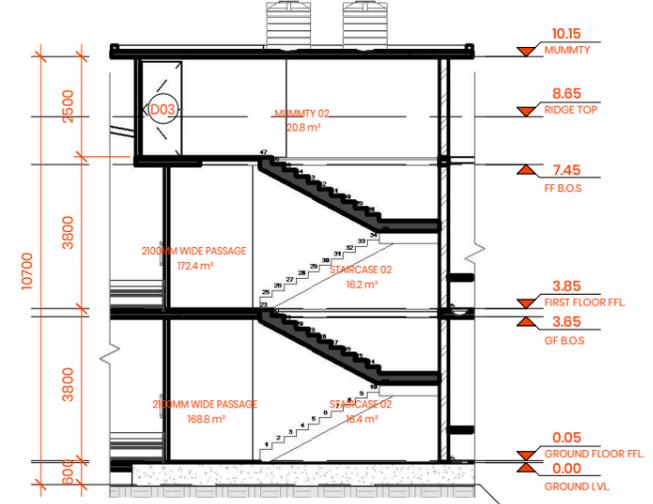
PROJECT DATE
14.02.2026



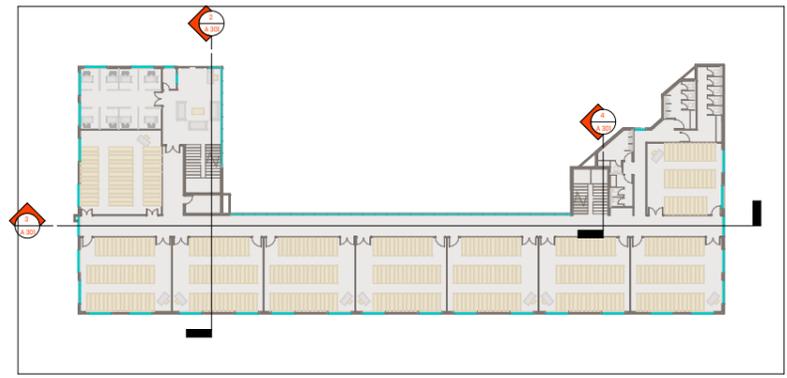
3 SECTION A-A'
1 : 125



2 SECTION B-B'
1 : 125



4 SECTION C-C'
1 : 125



1 GROUND FLOOR KEY PLAN

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REV. NO.	DESCRIPTION	DATE

KEY PLAN

DESIGN CONSULTANT / ARCHITECTS
builten
ARCHITECTURE INTERIOR | EIM

SERVICES CONSULTANT

MAIN CONTRACTORS

CLIENT/PROJECT NAME

SHEET NAME

JHU PORTA

PROPOSED LAYOUT

SECTION

PROJECT NO.	JHU_19
SHEET ISSUE DATE	23.02.2026
DRAWN BY	D.K.
CHECKED BY	Y.S.
REVISION DATE	
SCALE	As indicated
SHEET STATUS	SCHEMATIC DESIGN

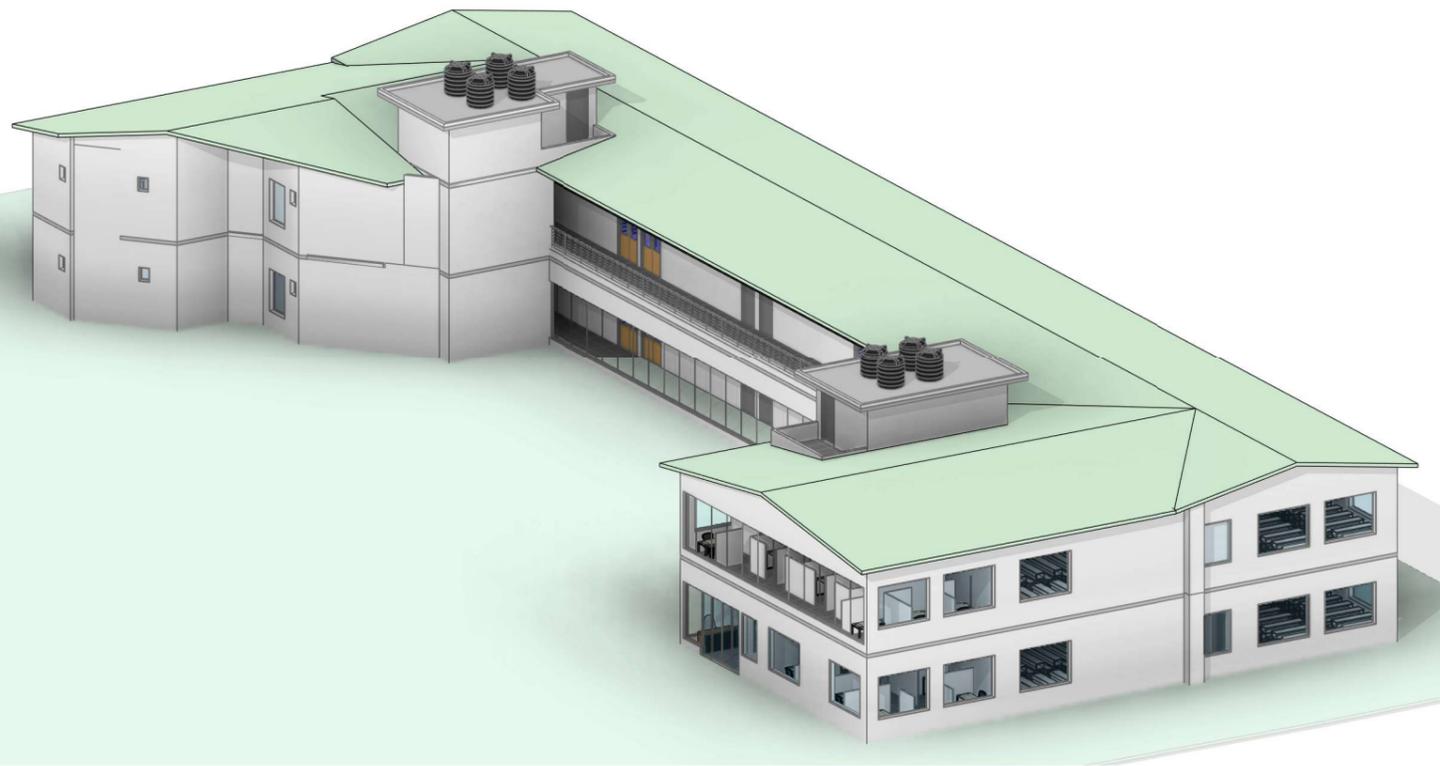
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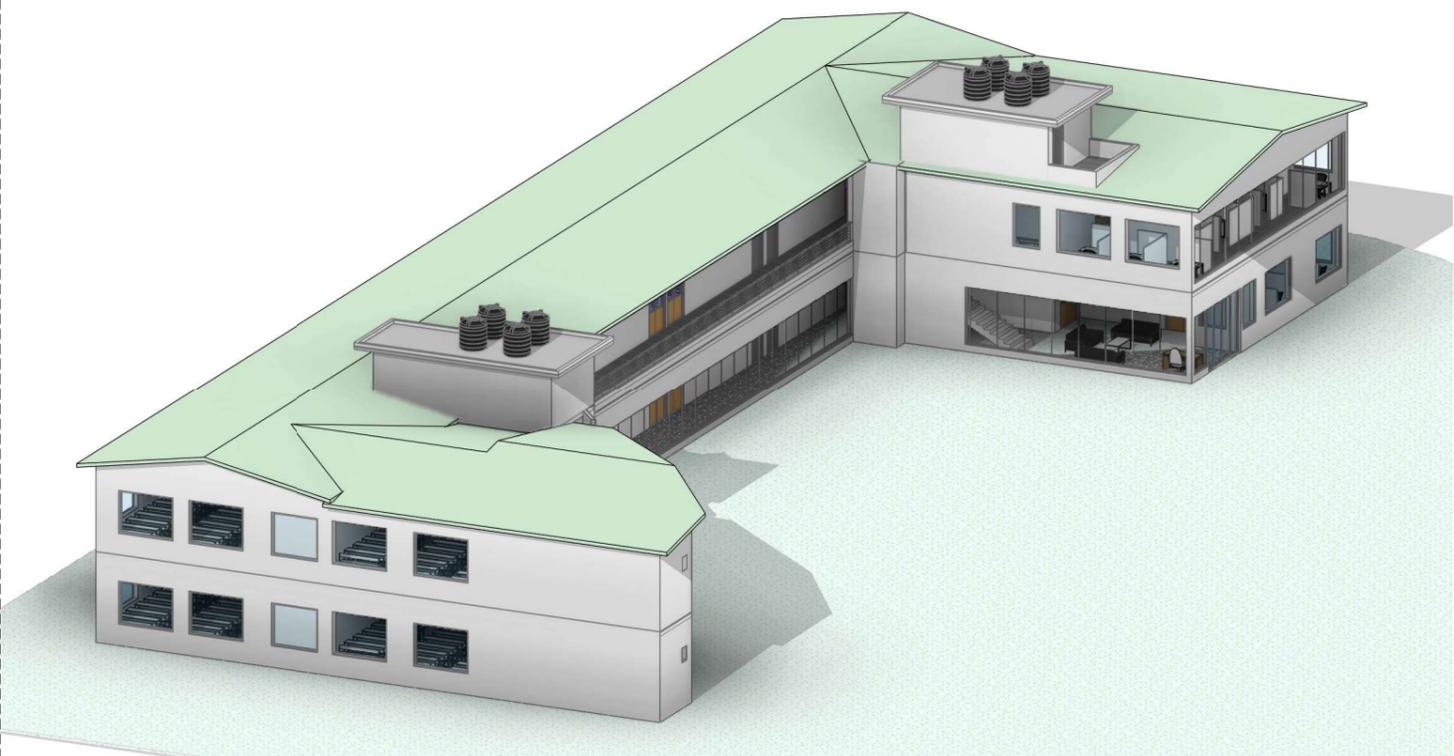
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SHEET SIZE-A2

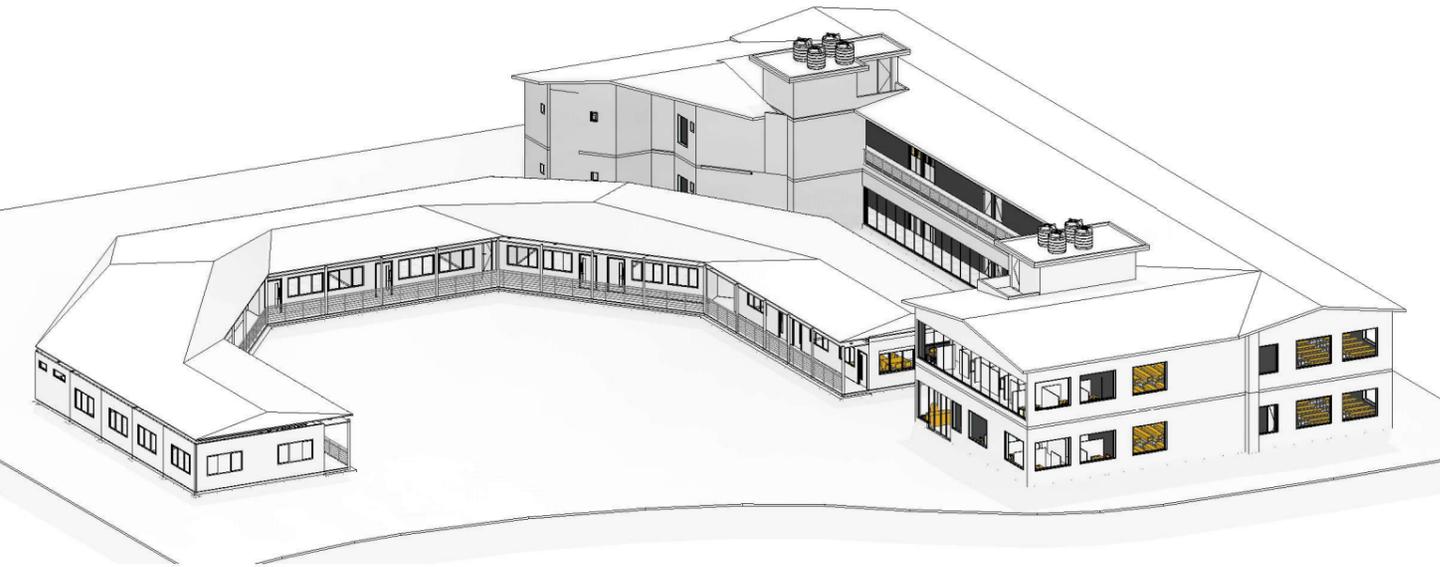
PROJECT DATE
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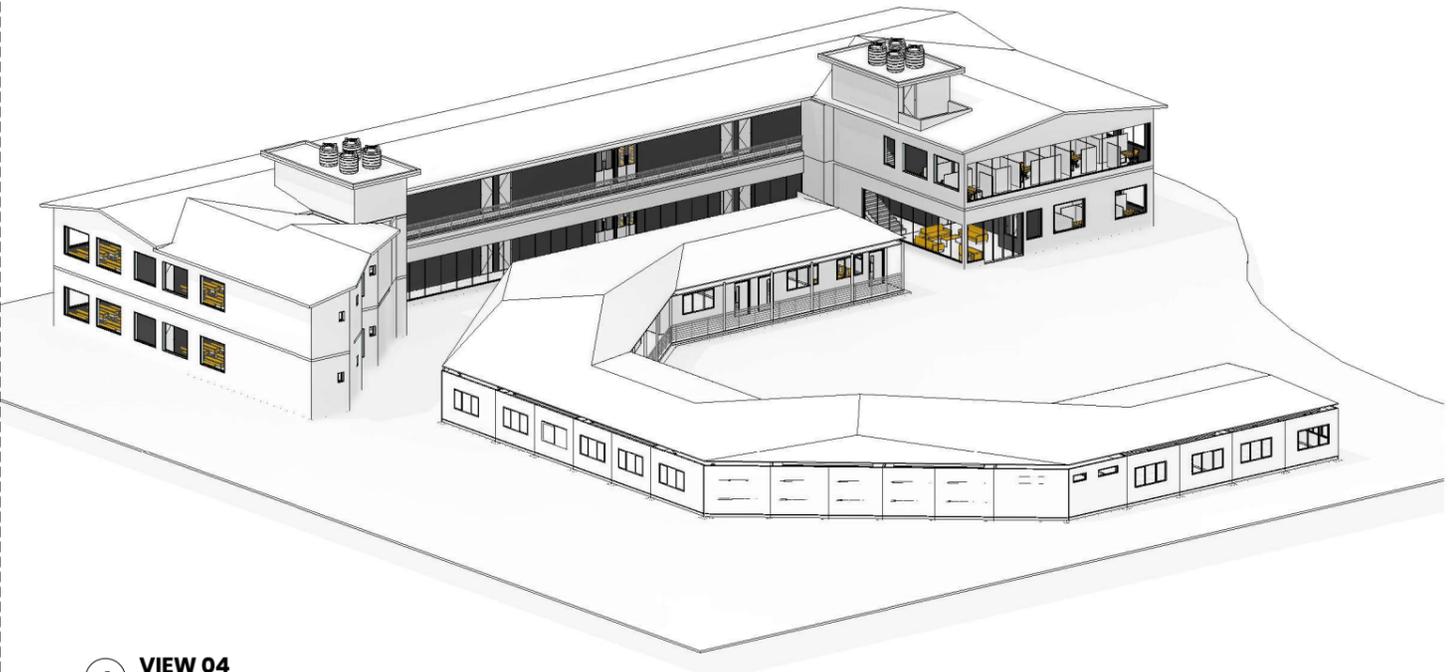
1 VIEW 01



2 VIEW 02



3 VIEW 03



4 VIEW 04

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REV. NO.	DESCRIPTION	DATE

KEY PLAN

DESIGN CONSULTANT ARCHITECTS
builten
 ARCHITECTURE INTERIOR | BIM
 SERVICES CONSULTANT

MAIN CONTRACTORS

CLIENT/PROJECT NAME

SHEET NAME

JHU PORTA

PROPOSED LAYOUT

3D VIEWS

PROJECT NO.	JHU_19
SHEET ISSUE DATE	23.02.2026
DRAWN BY	D.K.
CHECKED BY	Y.S.
REVISION DATE	
SCALE	
SHEET STATUS	SCHEMATIC DESIGN

A

203

R

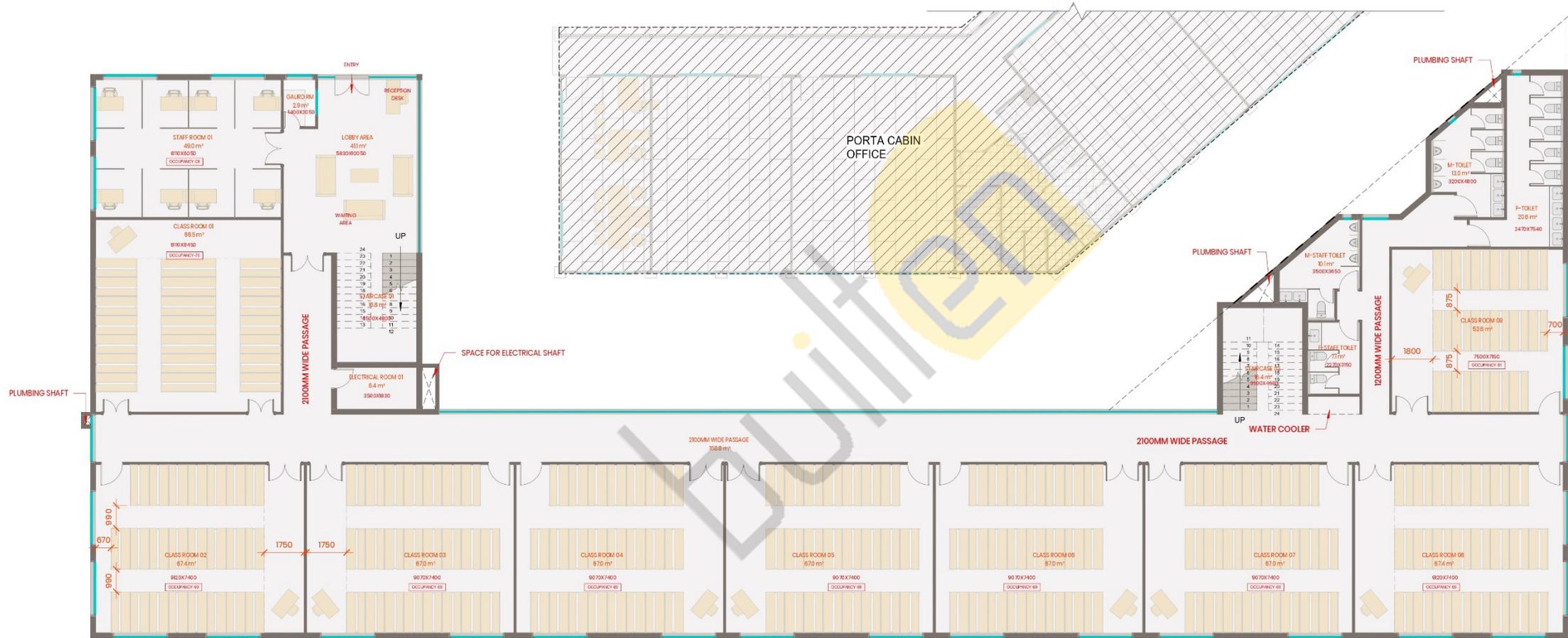
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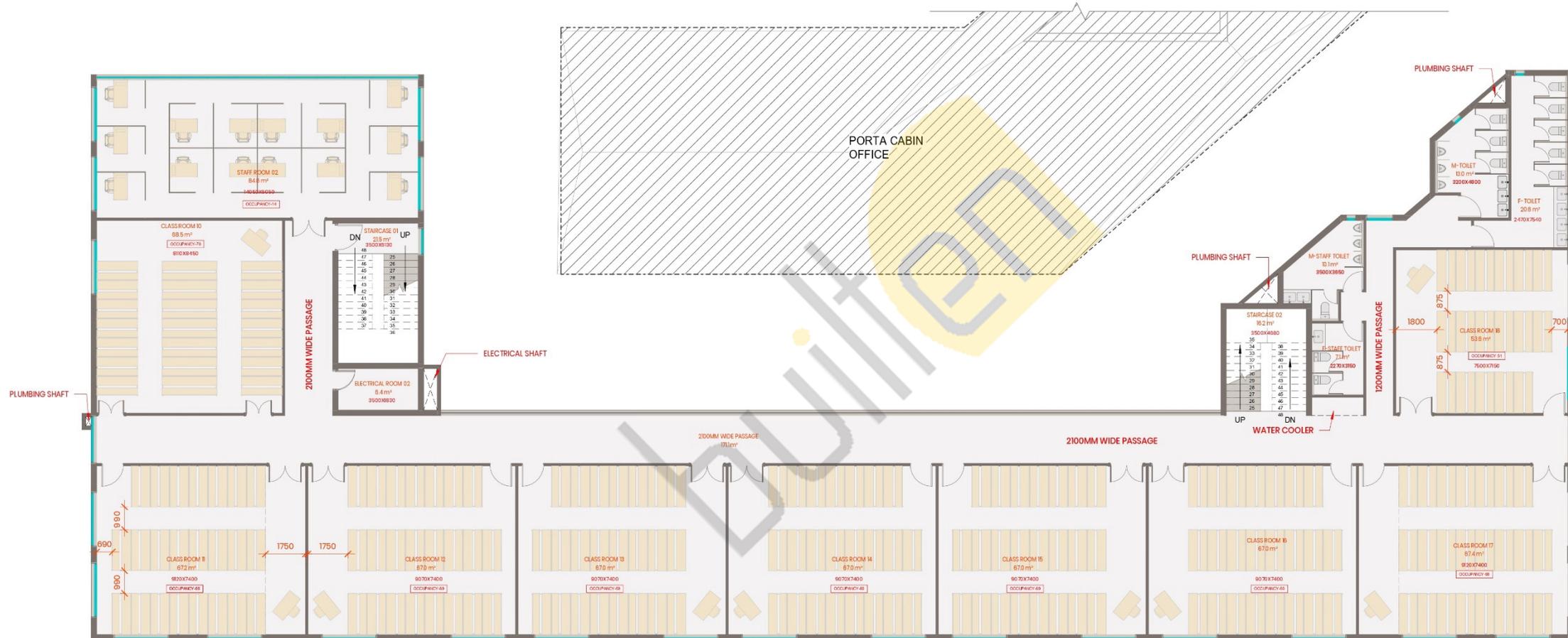
PROJECT DATE
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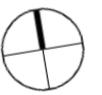
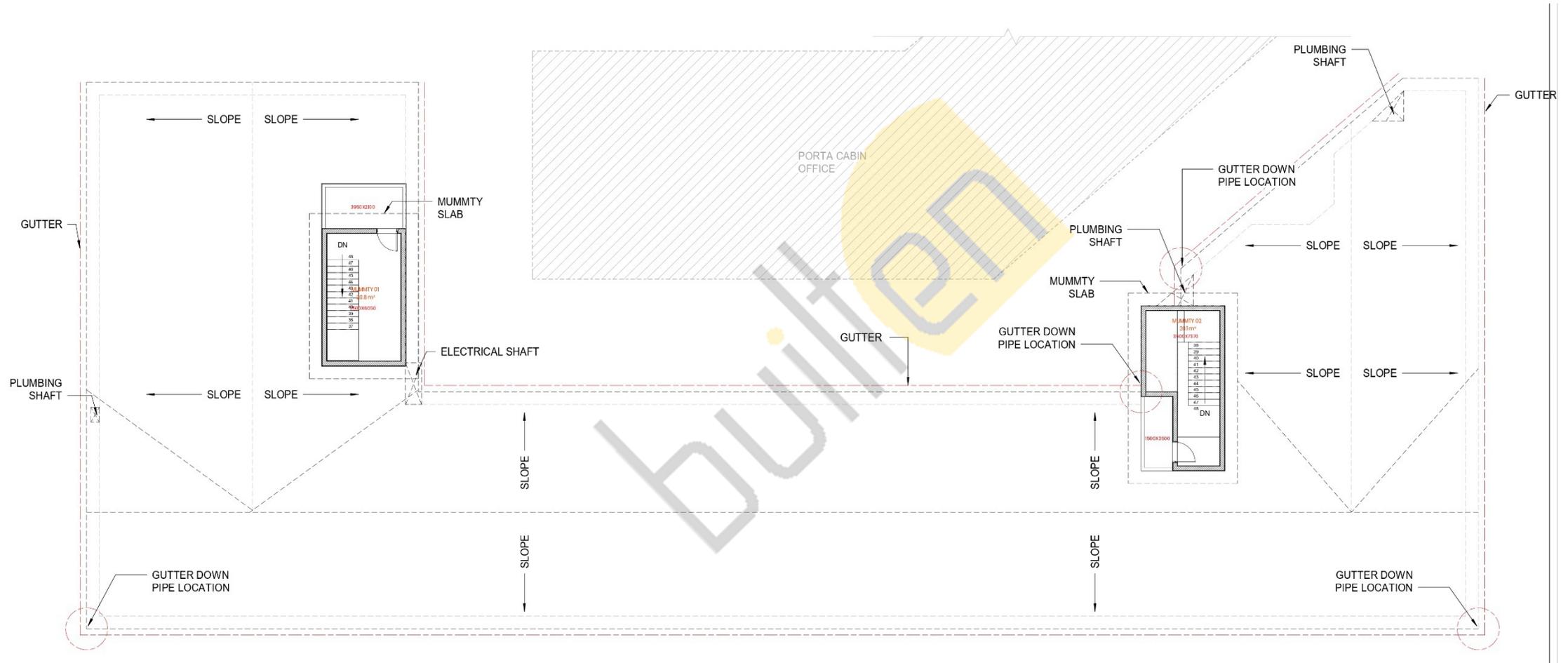


JHU-19 PORTA

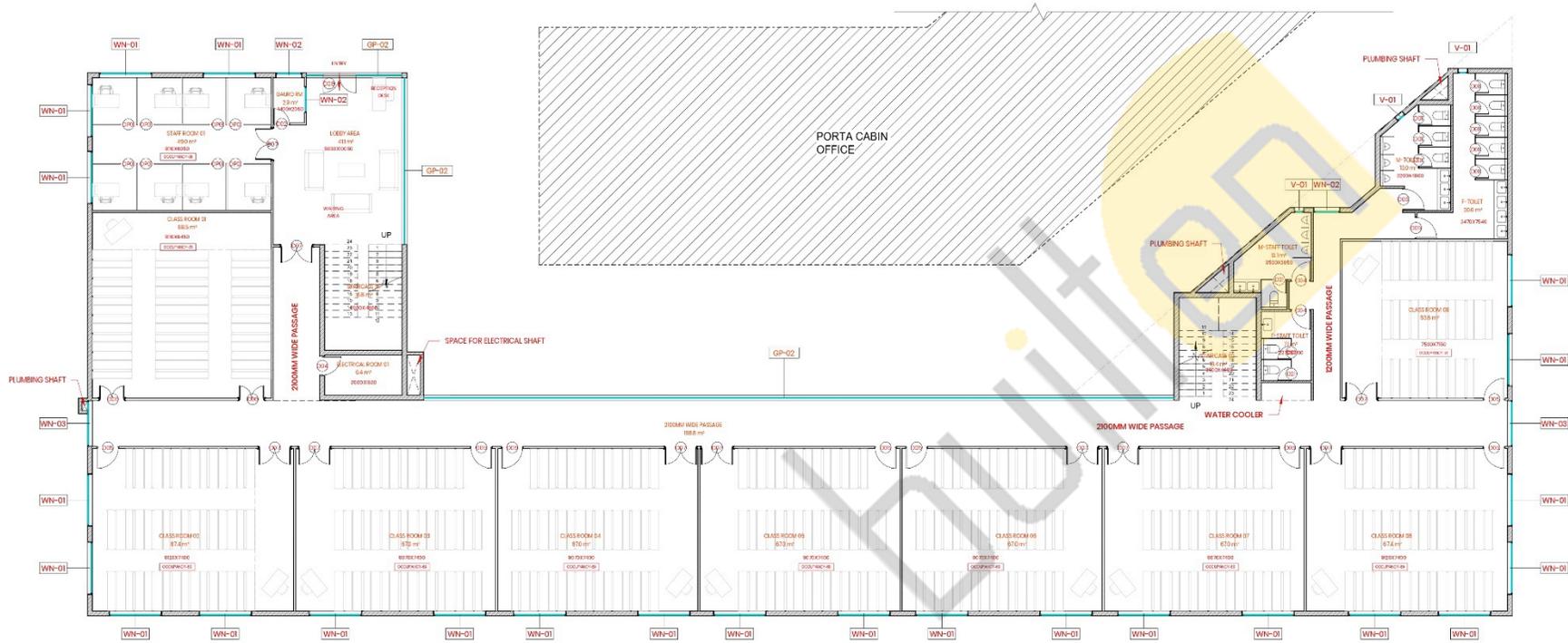
**JAMIA HAMDARD UNIVERSITY
NEW DELHI**





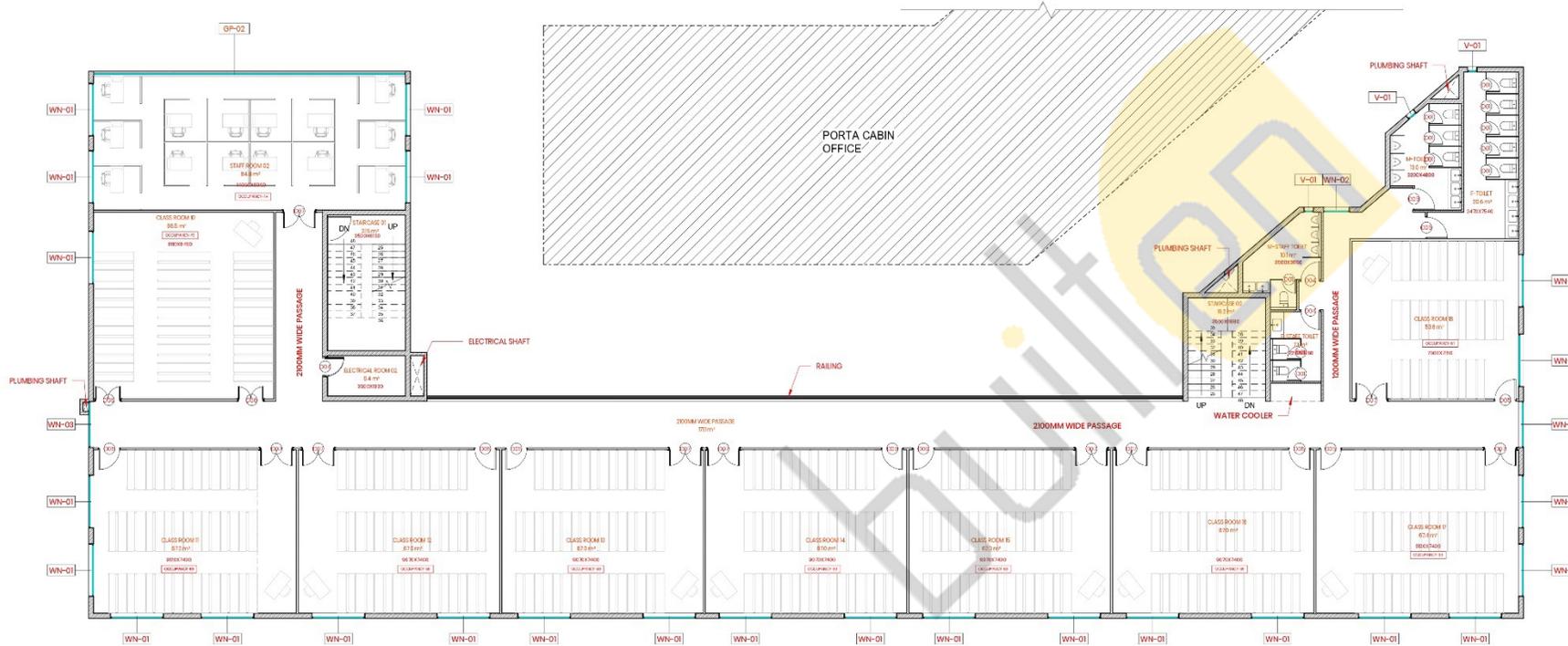


GROUND FLOOR AREA STATEMENT

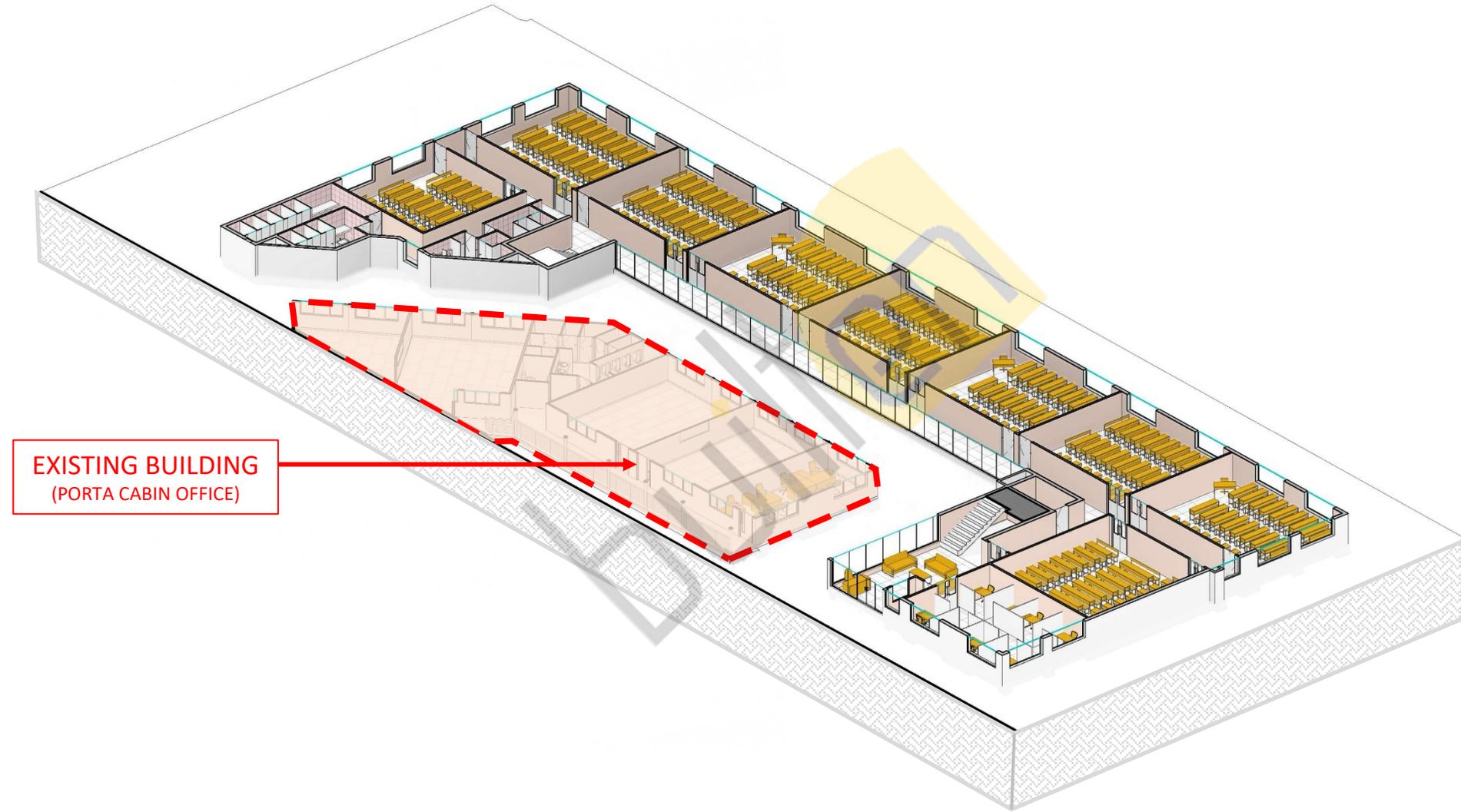


AREA STATEMENT			
Sr. No.	Area Name	Area (SQ.M.)	Occupancy
1	2100MM WIDE PASSAGE	339.9	0
2	CLASS ROOM 01	68.5	70
3	CLASS ROOM 02	67.4	69
4	CLASS ROOM 03	67	69
5	CLASS ROOM 04	67	69
6	CLASS ROOM 05	67	69
7	CLASS ROOM 06	67	69
8	CLASS ROOM 07	67	69
9	CLASS ROOM 08	67.4	69
10	CLASS ROOM 09	53.6	51
11	CLASS ROOM 10	68.5	70
12	CLASS ROOM 11	67.2	69
13	CLASS ROOM 12	67	69
14	CLASS ROOM 13	67	69
15	CLASS ROOM 14	67	69
16	CLASS ROOM 15	67	69
17	CLASS ROOM 16	67	69
18	CLASS ROOM 17	67.4	69
19	CLASS ROOM 18	53.6	51
20	ELECTRICAL ROOM 01	6.4	0
21	ELECTRICAL ROOM 02	6.4	0
22	F-STAFF TOILET	14.3	0
23	F-TOILET	41.1	0
24	GAURD RM	2.9	0
25	LOBBY AREA	41.1	0
26	M-STAFF TOILET	20.2	0
27	M-TOILET	25.9	0
28	MUMMTY 01	20.8	0
29	MUMMTY 02	20.1	0
30	STAFF ROOM 01	49	8
31	STAFF ROOM 02	84.8	14
32	STAIRCASE 01	38.3	0
33	STAIRCASE 02	32.6	0
Grand total		1927.8	1230

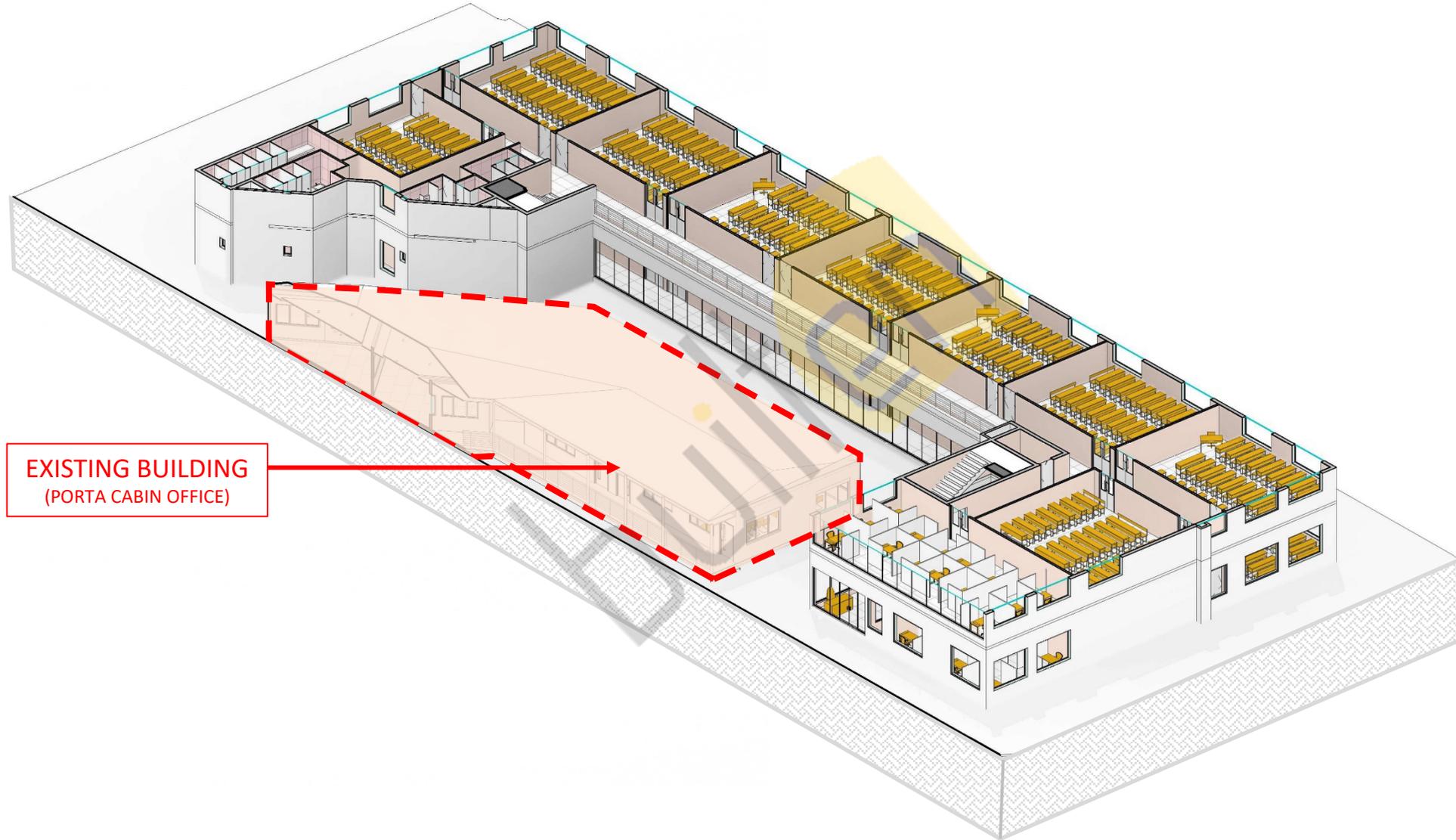
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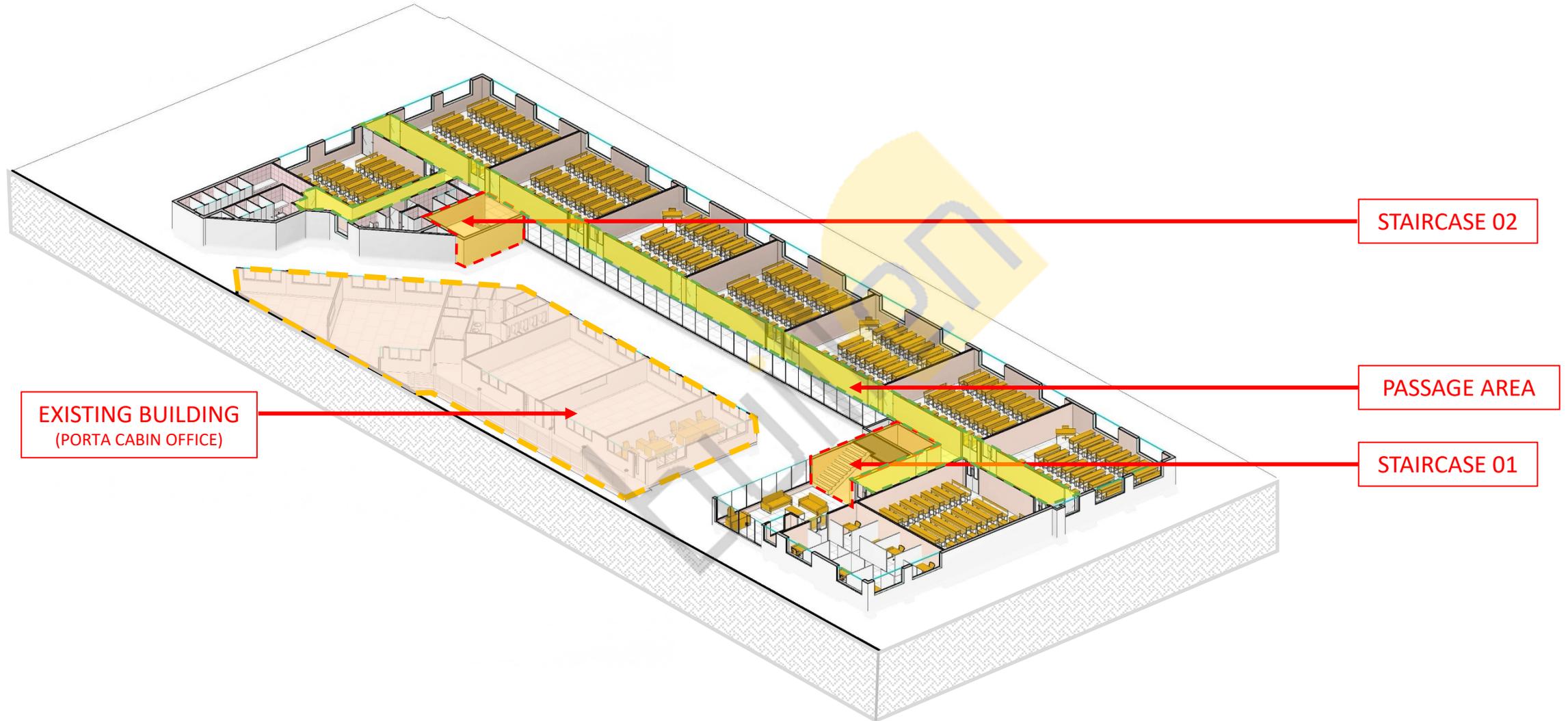
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9	CLASS ROOM 08	67.4	69
10	CLASS ROOM 09	53.6	51
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13	CLASS ROOM 12	67	69
14	CLASS ROOM 13	67	69
15	CLASS ROOM 14	67	69
16	CLASS ROOM 15	67	69
17	CLASS ROOM 16	67	69
18	CLASS ROOM 17	67.4	69
19	CLASS ROOM 18	53.6	51
20	ELECTRICAL ROOM 01	6.4	0
21	ELECTRICAL ROOM 02	6.4	0
22	F-STAFF TOILET	14.3	0
23	F-TOILET	41.1	0
24	GAURD RM	2.9	0
25	LOBBY AREA	41.1	0
26	M-STAFF TOILET	20.2	0
27	M-TOILET	25.9	0
28	MUMMTY 01	20.8	0
29	MUMMTY 02	20.1	0
30	STAFF ROOM 01	49	8
31	STAFF ROOM 02	84.8	14
32	STAIRCASE 01	38.3	0
33	STAIRCASE 02	32.6	0
Grand total		1927.8	1230

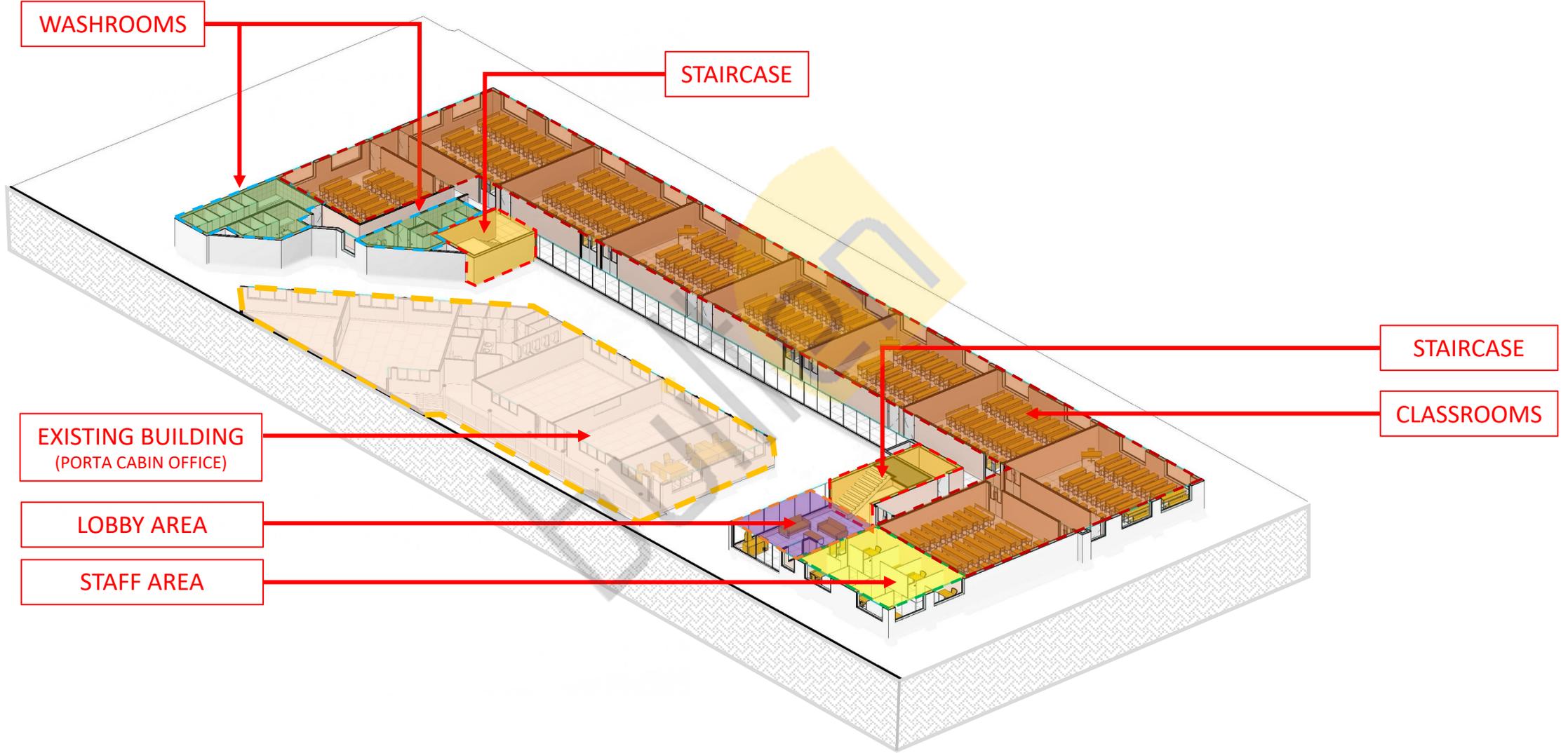


EXISTING BUILDING
(PORTA CABIN OFFICE)



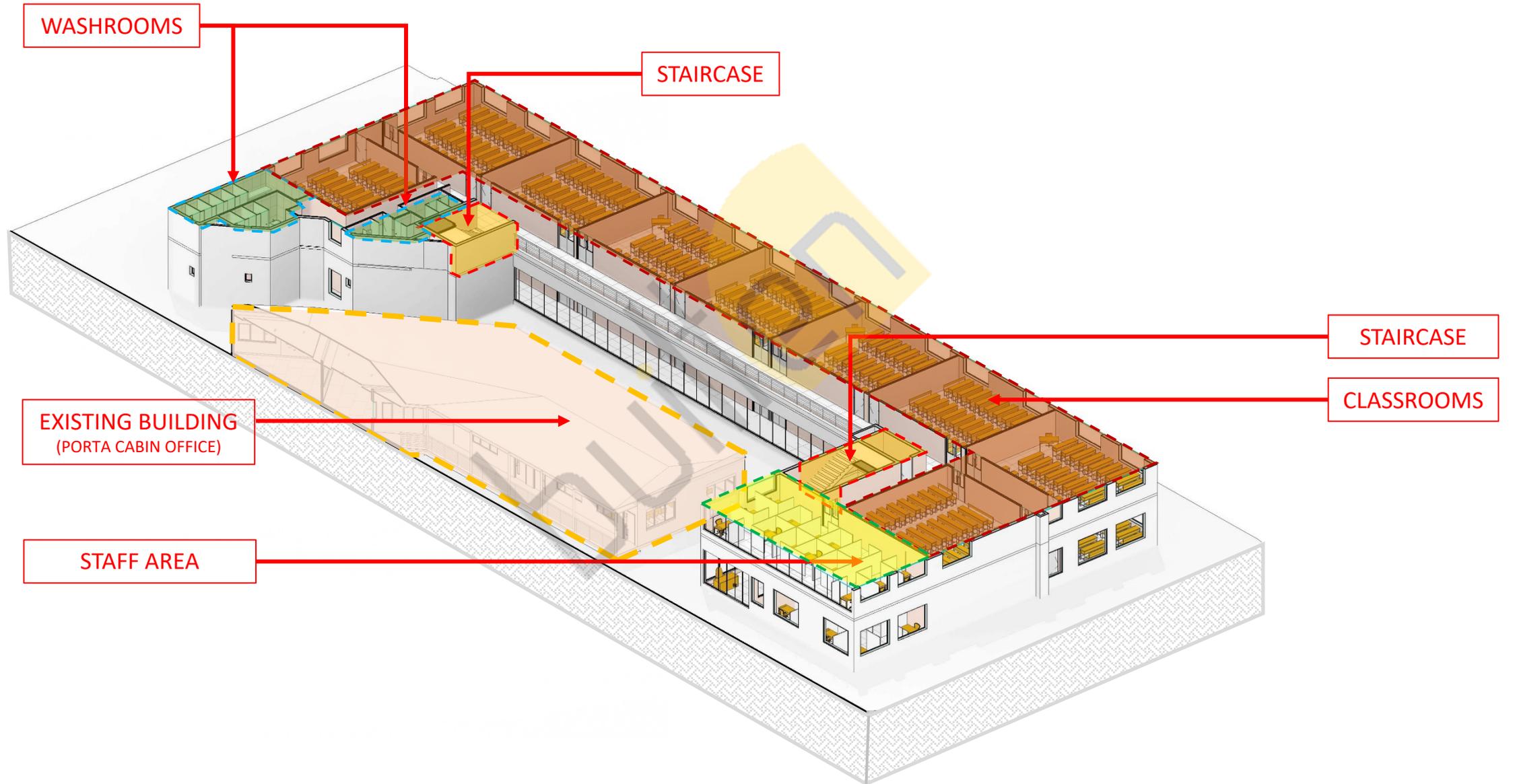
EXISTING BUILDING
(PORTA CABIN OFFICE)

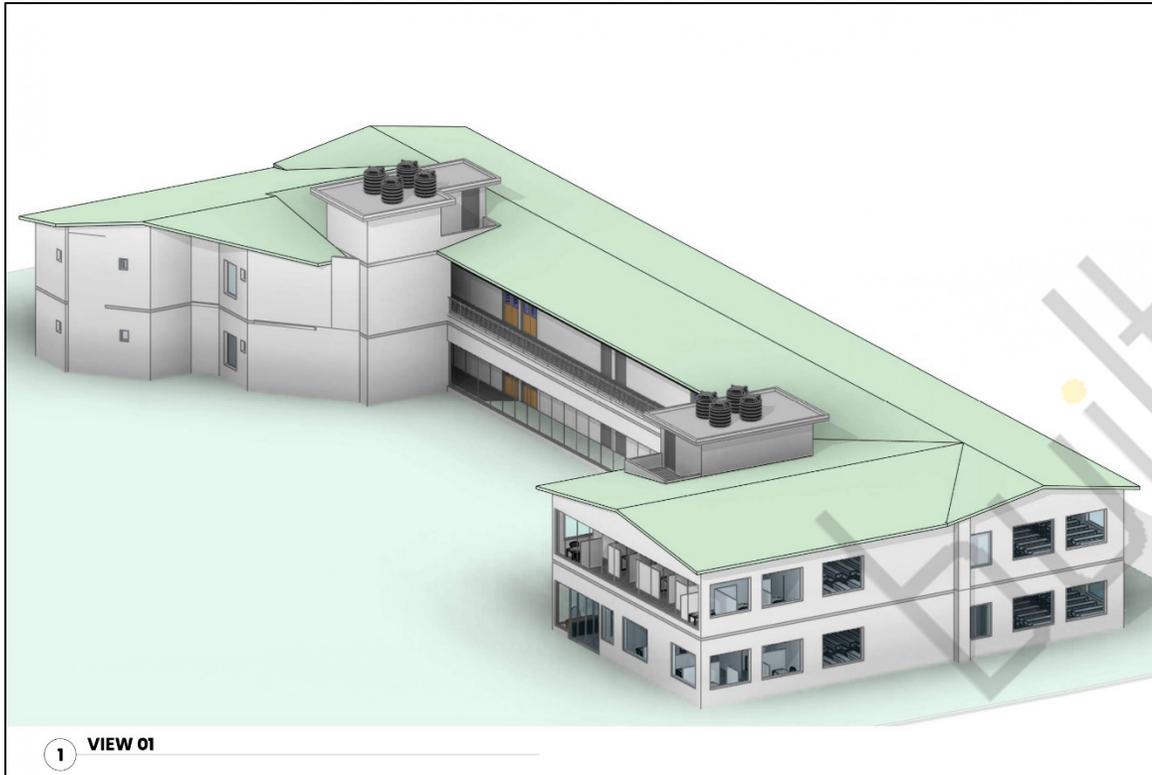


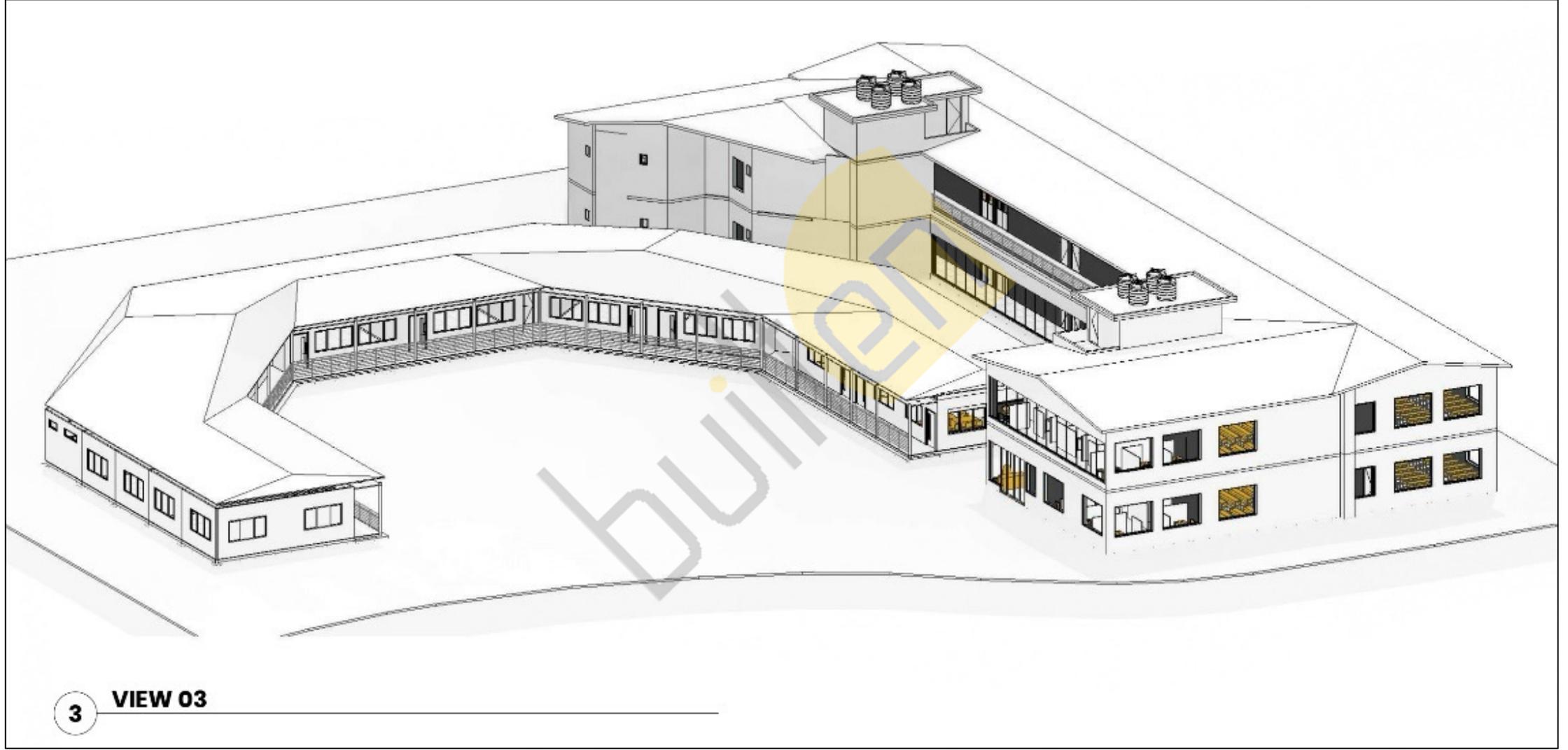




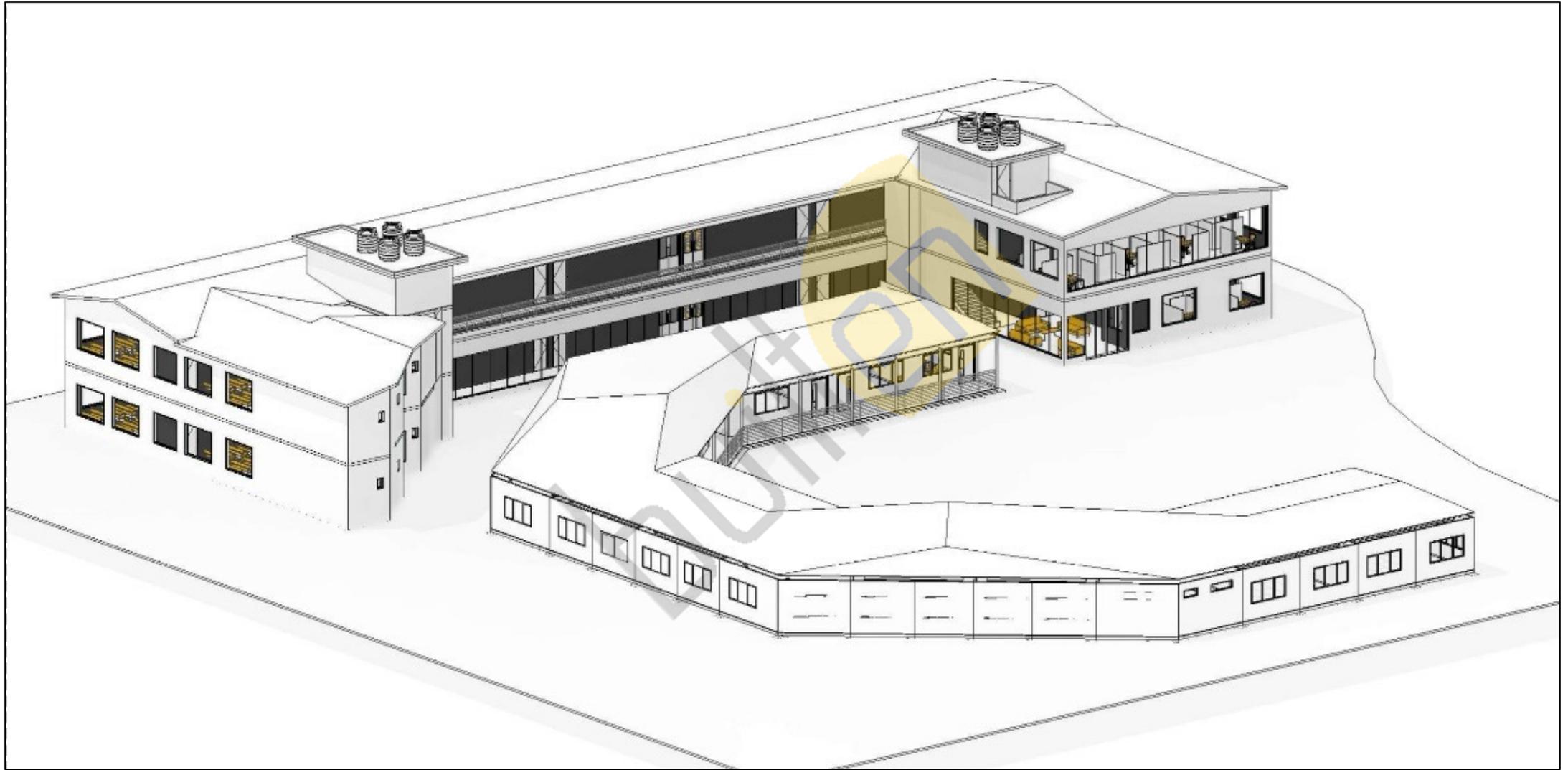
FIRST FLOOR ZONING





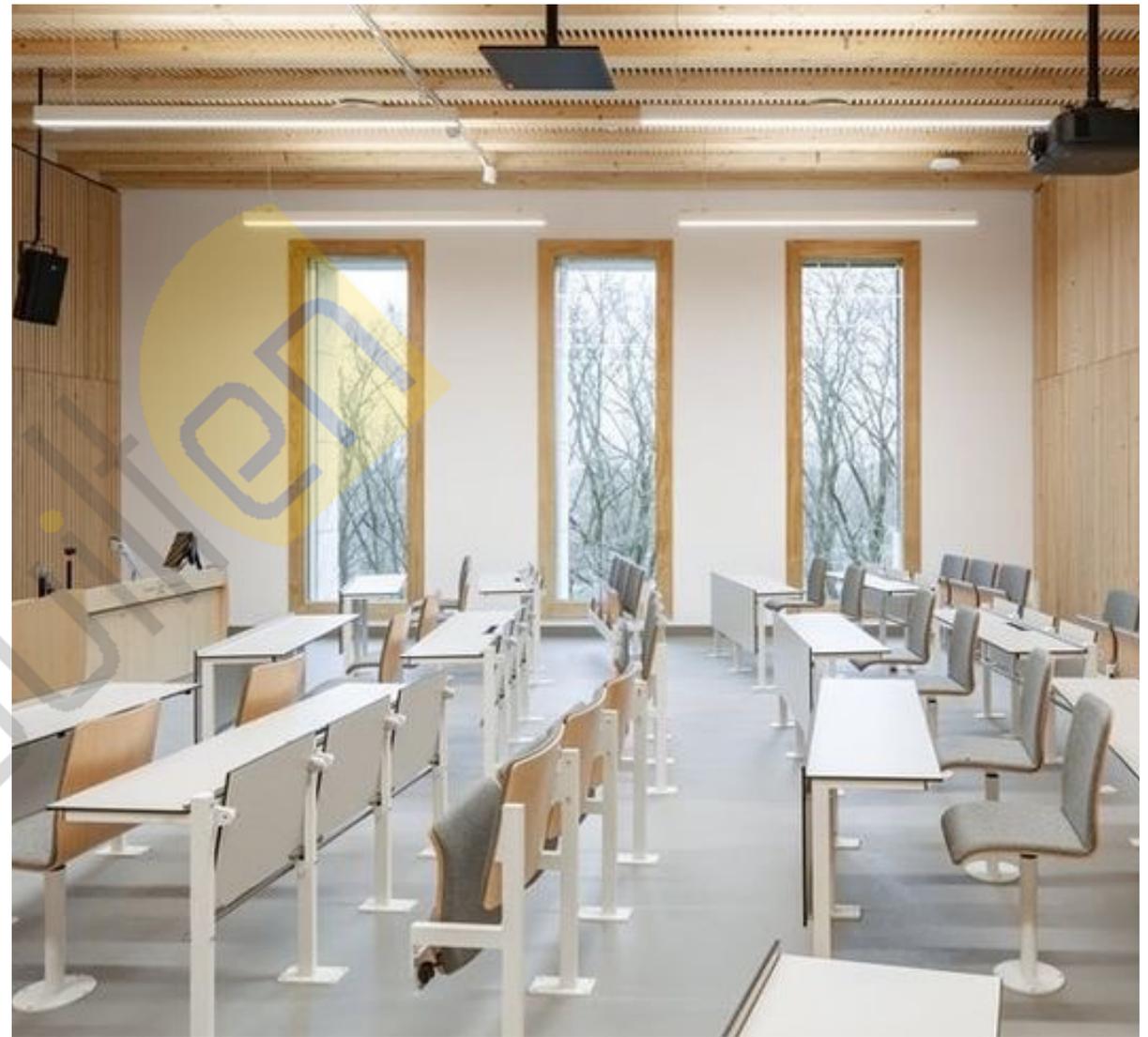


3 VIEW 03



































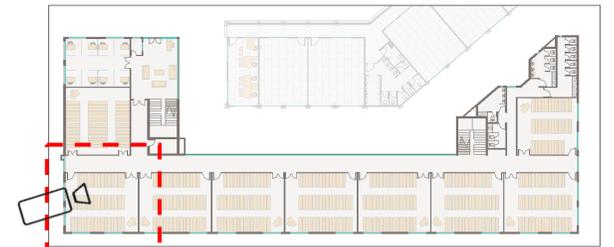








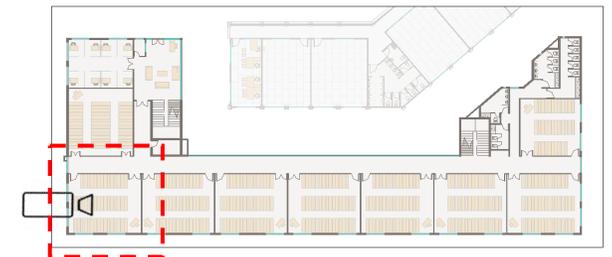
CLASSROOMS



GF KEY PLAN



CLASSROOMS



GF KEY PLAN



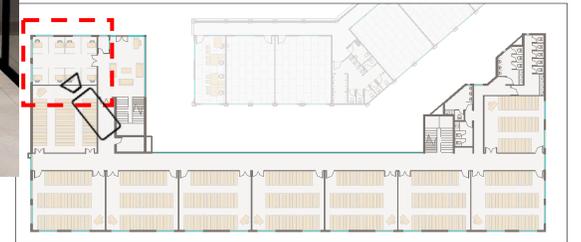
CLASSROOMS



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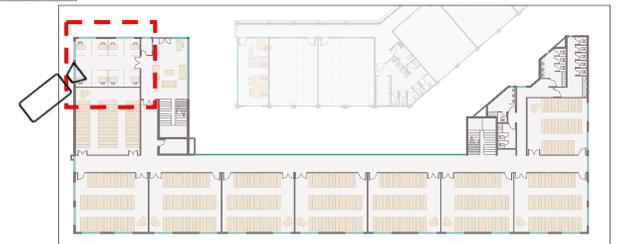
STAFF AREA



GF KEY PLAN



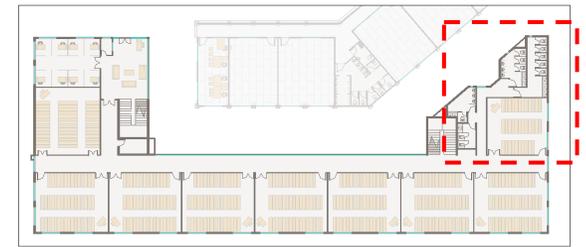
STAFF AREA



GF KEY PLAN



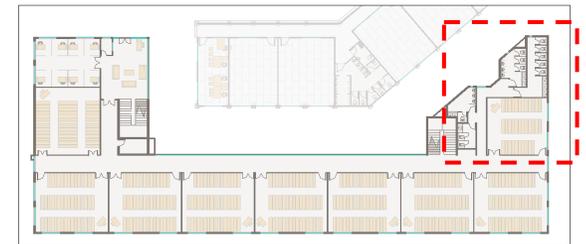
WASHROOMS



GF KEY PLAN



WASHROOMS



GF KEY PLAN

THANK YOU

BoQ**PORTA STRUCTURE (PORTA CLASSROOMS NEAR LIBRARY)****SUMMARY OF COST FOR CIVIL & INTERIOR WORKS, PLUMBING AND SANITARY WORK AND INTERNAL ELECTRICAL WORK.**

S.NO.	PART	DESCRIPTION	AMOUNT
1	A	CIVIL & INTERIOR WORKS	-
2	B	STRUCTURE	-
3	C	PLUMBING AND SANITARY WORKS	-
4	D	HVAC WORKS	-
5	E	INTERNAL ELECTRICAL WORKS	-
6	F	FURNITURE	-
	TOTAL (INCLUDING GST)		-
	GRAND TOTAL		-



PORTA STRUCTURE (PORTA CLASSROOMS NEAR LIBRARY)

SUMMARY OF COST FOR CIVIL & INTERIOR WORKS

S.No	DESCRIPTION				AMOUNT (RS)
A	DISMANTLING AND DEMOLISHING				-
B	CEMENT CONCRETE WORK				-
C	BRICK AND PORTA PARTITION WORK				-
D	CEILING WORKS				-
E	DOORS AND WINDOWS				-
F	FLOORING WORKS				-
G	PARTITION & PANNELLING WORKS				-
H	FINISHING WORKS				-
I	TOILET WORKS				-
J	WATER PROOFING				-
K	MISCELLANEOUS				-
	TOTAL OF CIVIL & INTERIOR WORKS				-

S.No	DESCRIPTION	UNIT	Qty	RATE (in Rs)	AMOUNT (in Rs)
A	DISMANTLING AND DEMOLISHING				
1	Disposal of building rubbish / mulba / similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge, within Campus premise, for all leads including all lifts involved.	Cum	500.00		-
	TOTAL OF DISMANTLING AND DEMOLISHING				-

S.No	DESCRIPTION	UNIT	Qty	RATE (in Rs)	AMOUNT (in Rs)
B	CEMENT CONCRETE WORK				
1	1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum	199.50		-
2	Providing and laying in position cement concrete of specified grade excluding the cost of shuttering 1:1.5:3 (1 cement:1.5course sand (zone-III) : 3 grade stone aggregate 20mm nominal size)	Cum	2.00		-
3	Providing and laying brick aggregate of 25 mm to 50 mm size in plinth protection work, including filling of voids with fine sand, watering, ramming, compaction and finishing complete, as per direction of Engineer-in-Charge.	Cum	40.00		-
4	Providing and laying damp-proof course 40 mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 12.5 mm nominal size derived from natural sources)	Sqm	150.00		-
	TOTAL OF CEMENT CONCRETE WORK				-

S.No	DESCRIPTION	UNIT	Qty	RATE (in Rs)	AMOUNT (in Rs)
C	BRICK AND PORTA PARTITIONS				
1	Providing and laying Autoclaved Aerated concrete(AAC) blocks masonry with 100 mm to 300 mm thick with Grade-1 AAC blocks of density 551 to 650 kg/cum conforming to IS:2185 (Part 3) in super structure above plinth level up to floor level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar all complete as per direction of Engineer-in-Charge. (The payment of RCC band and reinforcement shall be made for separately).	Cum	161.00		-
2	Making the opening in brick masonry including Dismantling in floor or walls by cutting masonry and making good the damages to walls, flooring and jambs complete, to match existing surface i/c disposal of mulba/rubbish to the nearest municipal dumping ground, all complete as per direction of Engineer-in- Charge. For door / Window/clestroy window.	Sqm	25.00		-
3	Providing and fixing HPL compact laminate toilet cubicle partition of approved colour and finish for cubicle size 900 x 1200 mm and height 2100 mm, including door and SS-304 accessories complete, as per direction of Engineer-in-Charge.	NO.	22.00		-
	TOTAL OF BRICK AND PORTA PARTITIONS				-

S.No	DESCRIPTION	UNIT	Qty	RATE (in Rs)	AMOUNT (in Rs)
D	CEILING WORKS				
1	Providing and fixing tiled false ceiling of specified materials of size 595x595 mm in true horizontal level, suspended on inter locking metal grid of hot dipped galvanized steel sections (galvanized @120 grams/ sqm, both side inclusive) consisting of main "T" runner with suitably spaced joints to get required length and of size 24x38mm made from 0.30 mm thick (minimum) sheet, spaced at 1200mm center to center and cross "T" of size 24x25 mm made of 0.30mm thick (minimum) sheet, 1200 mm long spaced between main "T" at 600 mm center to center to form a grid of 1200x600 mm and secondary cross "T" of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm and laying false ceiling tiles of approved texture in the grid including, required cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main "T" runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x1.6 mm fixed to ceiling with 12.5 mm dia and 50mm long dash fasteners, 4 mm GI adjustable rods with galvanised butterfly level clips of size 85 x 30 x 0.8 mm spaced at 1200 mm center to center along main T, bottom exposed width of 24 mm of all T-sections shall be pre-painted with polyester paint, all complete for all heights as per specifications, drawings and as directed by Engineer-in-charge.				
	12.5 mm thick fully Perforated Gypsum Board tile made from plasterboard having glass fibre conforming to IS:2095 part I, of size 595x595 mm, having perforation of 9.7x9.7 mm at 19.4 mm c/c with center borders of 48mm and the side borders of 30 mm, backed with non woven tissue on the back side, having an NRC (Noise Reduction Coefficient) of 0.79, with 50 mm resin bonded glass wool backing.	Sqm	1600.00		-
2	Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (b)Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (bothside inclusive) as per IS : 277 and consisting of angle cleats of size25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I.wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with :oth side inclusive) as per IS : 277 12.5 mm thick tapered edge Glass Reinforced Gypsum (GRG) board conforming to IS: 2095- (Part 3):1996 (Boards with BIS certification marks)				
2.a	"12.5 mm thick tapered edge gypsum moisture resistant board"	Sqm	300.00		-
	TOTAL OF CEILING WORKS				-
E	DOORS AND WINDOWS				



1	<p>Wooden Flush Door: Providing and fixing factory-made, ISI-marked solid-core flush door shutter, 35 mm thick, conforming to IS 2202 (Part 1), with block-board core, frame of 1st-class hardwood, and well-seasoned hardwood edge lipping (minimum 25 mm depth) on all edges. Both faces finished with 1.0 mm thick laminate conforming to IS 2046, colour/pattern as approved, fixed with phenol-formaldehyde / BWR adhesive to IS 848. Shutter to have hardwood blocks at hardware locations.</p> <p>The rate shall be inclusive of: - Door Chaukhat of 50x75mm finished in melamine polish to the matching color of laminated selected or MS angle finished in red oxide and enamel paint matching to the finish of laminate as per EIC/PMC selection - All necessary stainless steel butt hinges with SS screws. - One set of approved make heavy-duty mortise lock (with pair of handles). - Tower bolts (150 mm) to ISI specifications. - 300x600mm Vision panels - All incidental fittings for proper functioning. - Labour for fitting to prepared frames, including cutting, drilling, and adjustment. - Louvers, door closer, stopper, and final polishing/painting of laminate edges, unless otherwise specified</p> <p>Installation complete at all heights and locations as per manufacturer's instructions and Architect's approval. Measurement shall be on shutter area (sqm).</p>					
i	WOODEN DOORS (1500X2400) DOUBLE DOOR	NO.	20.00			-
ii	WOODEN DOORS (900X2400)	NO.	6.00			-
iii	WOODEN DOORS (1000X2400)	NO.	22.00			-
iv	WOODEN DOORS (1200X2400) DOUBLE DOOR	NO.	4.00			-
v	WOODEN DOORS (750X2400)	NO.	1.00			-
						-
						-
2	<p>Glass Door: Providing and fixing frameless door shutter made from 12 mm thick toughened (tempered) safety glass conforming to IS 2553 (Part 1):2018, with polished edges and factory-made cut-outs/holes as per hardware templates: size as shown on drawings. Door to be fixed with stainless-steel patch fittings (SS 304) including top patch with pivot, bottom patch with pivot insert, compatible overpanel/side-panel patches wherever required, and complete alignment and commissioning.</p> <p>Include: one double-action hydraulic floor spring conforming to IS 6315, with stainless-steel cover plate, suitable for door leaf up to 100-125 kg; adjustable closing and latching speeds; cutting of floor, pocket box setting, grouting, and finishing flush with floor.</p> <p>Include: one pair (back-to-back) D-type pull handles in SS 304, 32 mm tube dia, 600 mm CTC (approx.), satin finish, through-bolted with nylon gaskets for 12 mm glass; all fasteners, gaskets and accessories.</p> <p>Execution: set-out, drilling, fixing, sealing and making good; ensure even gaps and smooth double-action. Measurement: by shutter Nos.</p> <p>Exclusions (unless noted): locks/access control, signage, electronic door hardware, manifestation film. Notes: Base conformance to CPWD DSR framework—glass door shutter with floor spring (Ref. DSR 21.18) and floor spring requirements (Ref. DSR 21.4.x). Finish/handle brand as approved.</p>					
i	GLASS DOORS (900X2400)	NO.	2.00			-
ii	GLASS DOORS (1500X2400)(Double Door)	NO.	1.00			-
3	<p>Windows With lock, frame and other complete accessories Aluminium Sliding Window — Double Track (Powder Coated)</p> <p>Description: Providing and fixing factory-made double-track sliding window using extruded aluminium sections of approved make conforming to IS 733/IS 1285; powder-coated minimum 50 µm (shade as approved). Outer frame with two tracks and matching sliding shutter profiles with meeting interlock; mechanically jointed with aluminium cleats and SS-304 screws. Weathering system to include EPDM/neoprene gaskets, wool-pile weather strips at interlocks and rails, and drain/weep holes in bottom track. Each shutter on twin adjustable nylon rollers with SS ball bearings; anti-lift blocks; crescent cam lock with keeper; all incidental fittings complete. Glazing (included): 6 mm clear float glass to IS 14900, set on EPDM gaskets with clip-on snap beading. (Where shown/scheduled, provide 6 mm toughened safety glass to IS 2553 (Part 1) instead.) Aluminium Grill on External facade</p> <p>Installation: true to line/level, plumb and square; perimeter sealed with neutral-cure silicone; complete cleaning and commissioning for smooth, rattle-free sliding and positive locking. Measurement: by finished outer frame area (sqm). Finish option (if preferred): Anodized to IS 1868, minimum AC-15.</p>	sqm	248.40			-
4	<p>Aluminium Mullion-Transom Glazing with DGU (Stick System) Providing, fabricating, supplying and fixing aluminium glazed curtain-wall (stick type) comprising extruded aluminium alloy 6063-T5/T6 mullions & transoms (section depth as per design, wall ≥2.0 mm), pressure plates & snap-on caps, EPDM gaskets, SS fasteners, GI/SS anchor brackets & cleats, powder-coated (60-80 µm) / anodized (≥15 µm), factory-sealed IGU ≈28 mm (6T + 16 mm argon warm-edge spacer + 6 mm soft-coat Low-E; dual seal PIB + structural silicone), setting blocks, drainage/pressure-equalised glazing, sealants, hoisting, scaffolding and all incidentals, conforming to IS 733/1285/1868/15965, IS 14900/2553/16231; IGU to ASTM E2190/EN 1279, complete in all respects and as per direction of Engineer-in-Charge.</p>	sqm	30.00			-
5	<p>Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners, stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).</p>	Kg	600.00			-
6	<p>Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a prim</p> <p>In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works</p>	Kg	600.00			-
	TOTAL OF DOORS AND WINDOWS					-
F	FLOORING					
1	<p>Providing and laying rectified Glazed Ceramic floor tiles of size 300x300mm or more (thickness to be specified by the manufacturer) of 1st quality conforming to IS:15622 of approved make, in colours white ivory, Grey, fume red Brown, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @3.3kg/sqm including grouting the joints with white cement and matching pigments etc. complete (anti skid floor tiles)</p>	Sqm	100.00			-
i	<p>Providing and laying Vitrified tiles in floor in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS:15622, of approved brand & manufacturer, in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) jointing with grey cement slurry @3.3 kg/sqm including grouting the joints with white cement and matching pigments etc. The tiles must be cut with the zero chipping diamond cutter only. Laying of tiles will be done with the notch trowel, plier, wedge, clips of required thickness, leveling system and rubber mallet for placing the tiles gently and easily. SIZE OF TILE 600X600MM</p>	Sqm	2000.00			-
2	<p>Providing & fixing Kota stone slabs 20 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.</p>	Sqm	130.00			-
3	<p>Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) : 11.26.1 25 mm thick</p>	Sqm	20.00			-



TOTAL OF FLOORING WORK					
G	PARTITION & PANELING				
1	<p>Low-height Partition — Sal wood Frame, Ply+Laminate, Toughened Glass Corner Panel- Partition height- 1500mm</p> <p>Scope/Configuration:</p> <ul style="list-style-type: none"> Overall height: 1500 mm (as per drawings), overall thickness ~75 mm (nominal). Modules: (A) Opaque laminated panel; (B) Glazed panel with timber surround; corner posts where required. <p>A) Framing (common to both modules)</p> <ul style="list-style-type: none"> Timber: Seasoned Sal wood sections, MC 8–12%, preservative-treated; vertical studs 50×50 mm @ ≤600 mm c/c; top/bottom rails 75×50 mm; intermediate rails as needed. Fixing: SS countersunk screws + concealed L-brackets/raw plugs at floor/walls; isolating strip at floor contact; pack plumb/level. <p>B) Opaque laminated panel</p> <ul style="list-style-type: none"> Sheathing: 12 mm BWP plywood (IS 710) each face or 12 mm BWR (IS 303) if approved. Finish: 1.0 mm HPL/laminate (IS 2046) on both faces; shade/texture as scheduled. Exposed edges lipped with 6–8 mm matching hardwood and finished to line. Joints: Vertical joints backed with noggings; 2–3 mm shadow gap or matching H-joint as detailed. <p>C) 1000 mm Glazed panel with timber surround (as visible)</p> <ul style="list-style-type: none"> Perimeter frame: Sal-wood slim surround 60–75 mm face × 50 mm thick, rebated for glazing; finished with laminate/clear PU to match. Glass: 12 mm fully-toughened safety glass (IS 2553-1) — **reeded/fluted vertical pattern** or clear as scheduled; polished arises, machine cut-outs if any. Setting & seals: EPDM/neoprene setting blocks; continuous EPDM glazing gasket or timber glazing beads with concealed pins; perimeter sealed with neutral-cure silicone; edge cover ≥10–12 mm. <p>D) Optional acoustic/rigidity (add if required)</p> <ul style="list-style-type: none"> Infill within opaque panels: 50 mm mineral/glass wool 24–48 kg/m³. Hidden steel flats at head/sill for long spans or where furniture abuts. <p>Execution & QA</p> <ul style="list-style-type: none"> Tolerances: plumb/level ±2 mm in 2 m; straightness ±3 mm in 5 m; uniform reveals. Finish: clean mitred corners, aligned grains; scribe neatly to floor/ceiling/walls; protect finished faces until handover. Hardware/fasteners: SS-304; adhesives low-VOC (PU/PVA for timber; contact adhesive for HPL). 	Sqm	140.00		-
2	<p>Dado Panelling — Aluminium Backer + 12 mm Ply + 1.0 mm Laminate (900 mm High)</p> <p>Description:</p> <p>Providing and fixing 900 mm high wall dado panelling on aluminium backer, comprising:</p> <p>A) Aluminium backer: extruded aluminium carriers/cleats (alloy 6063-T5/T6) — typical hat/T/angle sections 25×38×1.2 mm (min) or 25×25×1.5 mm, as detailed — fixed true to line/level on masonry/gypsum wall using SS-304 countersunk screws with nylon plugs @ ≤450 mm c/c; horizontal rails @ ≤450 mm c/c; plastic/EPDM isolators where dissimilar materials contact; packings to achieve a plane surface; expansion breaks at ~3 m bays.</p> <p>B) Substrate: 12 mm BWP plywood (IS 710) screw-fixed to the aluminium backer with SS wafer-head self-drilling screws @ ≤200 mm c/c along edges and ≤300 mm c/c at supports; provide noggings/backing at panel joints, corners and cut-outs.</p> <p>C) Finish: 1.0 mm high-pressure laminate (HPL) conforming to IS 2046 on the face (shade/texture as scheduled) **with 0.8–1.0 mm balancing laminate on the reverse** to prevent warping; adhesives low-VOC (contact/PU as recommended); exposed vertical edges lipped with 6–8 mm hardwood, flushed; top capping (solid wood/aluminium/laminate) 20–30 mm wide as detailed; 1–2 mm shadow groove or matching H-profile at panel joints; neat junction with skirting.</p> <p>D) Cut-outs: provide framed cut-outs for switches/sockets with edged reveals; seal perimeters with neutral-cure silicone where required.</p> <p>Execution & Tolerances: plumb/level ±2 mm in 2 m; flushness across joints ≤1 mm; clean mitred corners; protect finished surfaces until handover.</p> <p>Includes: aluminium backer/carriers, fasteners/anchors, 12 mm BWP ply, balancing laminate, face laminate, edge lipping, top capping, adhesives, sealant, protection and final cleaning.</p> <p>Excludes: wall levelling beyond local packings, electrical accessories/relocation, metal skirting/corner guards unless scheduled.</p> <p>Measurement: by running metre of finished length (height taken as 0.90 m). (If you prefer area measurement, use UOM: **sqm** with Area = length × 0.90 m.)</p>	Sqm			-
3	<p>Providing and fixing urinal partitions of 12 mm thick compact high pressure laminate (HPL) board (toilet cubicle grade), of approved colour and texture, including all necessary stainless steel (SS 304) fittings such as brackets, channels, screws, anchor fasteners, edge polishing, cut-outs, and making good the walls/floors complete as per direction of Engineer-in-Charge.</p> <p>The partition shall be fixed with SS wall-mounted brackets and floor support (if required), with all exposed edges machine finished and polished.</p> <p>Approved makes: Greenlam / Merino / CenturyPly / FunderMax or equivalent make approved by Engineer-in-Charge/PMC.</p> <p>Size: 600 mm wide x 900 mm height (or as per drawing).</p> <p>All complete as per drawings, specifications and directions of Engineer-in-Charge.</p>	Nos.	12.00		-
TOTAL OF PARTITION & PANELING					-
H	FINISHING WORK				
1	12mm cement plaster of mix: 1:6(1 cement : 6 fine sand)	Sqm	700.00		-
2	15mm cement plaster on the rough side of single of half brick wall of mix: (1cement:6 fine sand)	Sqm	700.00		-
3	POP Punning - Providing and applying average 12 to 15mm thick POP Wall punning in line, level and plumb on general walls"	Sqm	700.00		-
4	Finishing with Deluxe Multi surface paint system for interiors and exteriors using Primer as per manufacturers specifications : Two or more coats applied on walls @ 1.25 ltr/10 sqm over and including one coat of Special primer applied @ 0.75 ltr /10 sqm	Sqm	3800.00		-
5	Finishing walls with textured exterior paint of required shade : New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/10 sqm	Sqm	1700.00		-



6	Providing and fixing of industrial tape with fill in the joints and sealants. Providing and laying or putty on wall surface with render smooth and sanded ready for application of paint finishes. Providing and applying water proof paint on the inside wall(Make Asian/ Burger) in any desired shade as per the client. Providing and applying out side superfine paint (Make globe paints) in any desired shade as per the client.(External wall).	Sqm	1198.15		-
7	Painting With Synthetic enamel paint of approved brand and manufacture of required colour to give an even shade: Two or more coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacture	Sqm	500.00		-
8	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (Thickness to be specified by the manufacturer) of approved make, in all colours, shades except burgundy , bottle green,black of any size as approved by Engineer-In-Charge, in skirting,risers of steps and dados, over 12mm thick bed of cement mortar 1:3(1 cement : 3 coarse sand) and jointing with grey cement slurry 3.3kg/sqm ,including pointing in white cement mixed with pigment of matching shade complete.		800.00		-
TOTAL OF FINISHING WORK					
-					
I TOILETS/PANTRY					
1	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills , facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.	Sqm	15		-
2	Extra for providing opening of required size & shape for wash basin/ kitchen sink in kitchen platform, vanity counter and similar location in marble/ granite/ stone work, including necessary holes for pillar taps etc. including moulding, rubbing and polishing of cut edges etc. complete.	NOS	20		-
TOTAL OF TOILET WORK					
-					
J WATER PROOFING					
1	Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of W.C. , kitchen and the like consisting of:(i) 1st course of applying cement slurry @ 4.4kg/sqm mixed with water proofing compound conforming to IS 2645 in recommended proportions including rounding off junction of vertical and horizontal surface.(ii) 11nd course of 20mm cement plaster 1:3(1cement : 3 coarse sand)mixed with water proofing compound in recommended proportion including rounding off junction of vertical and horizontal surface. (iii) 11rd course of applying blown or residual bitumen applied hot at 1.7kg per /sqm of area.(iv) 1Vth course of 400micron thick PVC sheet. (Overlaps at joints of PVC sheet should be 100mm wide and pasted to each other with bitumen @1.7kg/sqm).	sqm	250.00		-
TOTAL OF WATER PROOFING					
-					
K MISCELLANEOUS					
1	Providing and fixing pelnets to Blinds made of 19 mm thick BWP ply, having clear internal dimensions as 150 x 200mm, finished in approved laminate on all exposed surfaces from all external surfaces and balancing laminate on all internal surfaces, supported from RCC ceiling slab by necessary framework, giving additional supports in MS angles etc. complete. All exposed edges to be finished in 5mm thick TW beading and finished in approved colour.	Rmt	100.00		-
2	Providing and fixing mirror of require shape and size with 20mm wide bevelled edges with 6 mm thick hard board backing.	sqm	5.00		-
3	Supply and Installation of Double Schafolding for Exterior as well as Interior works wherever required	L/S	1.00		-
4	Treatment of soil under existing floors using chemical emulsion @ one litre per hole, 300 mm apart including drilling 12 mm diameter holes and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor. 2.35.3.1 With Chlorypyriphos/Lindane E.C. 20% with 1% concentration	sqm	1100.00		-
5	Cutting holes up to 15x15 cm in R.C.C. floors and roofs for passing drain pipe etc. and repairing the hole after insertion of drain pipe etc. with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including finishing complete so as to make it leak proof.	NOS	50.00		-
TOTAL OF MISCELLANEOUS					
-					



PORTA STRUCTURE (PORTA CLASSROOMS NEAR LIBRARY)

SUMMARY OF COST FOR CIVIL WORKS

S.No	DESCRIPTION			AMOUNT (RS)
A	STRUCTURAL WORKS			-
B	GROUND WORKS			-
C	NEW TECHNOLOGIES			-
	TOTAL OF CIVIL WORKS			-

S.No	DESCRIPTION	UNIT	Qty	RATE (in Rs)	AMOUNT (in Rs)
A	STRUCTURAL WORKS				
1	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete	Kg	144000.00		-
	TOTAL OF STRUCTURAL WORK				-
B	GROUND WORKS				
1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.	Cum	1379.16		-
2	Providing and laying in position ready mixed or site batched design mix cement concrete for plain cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana/Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering and finishing as per direction of the engineer-in-charge; for the following grades of concrete. All works upto plinth level : Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the minimum specified cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				-
i	Concrete of M10 grade with minimum cement content of 220 kg /cum	Cum	59.58		-
6	Centering and shuttering including strutting, propping etc. and removal of form work for : Foundations, footings, bases for columns	Sqm	1619.85		-
7	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum	1054.45		-
8	Twisted steel/ deformed TMT bars Fe-500D	KG	5735.00		-
9	Providing and laying in position ready mixed or site batched design mix cement concrete for plain cement concrete work; using coarse aggregate and fine aggregate derived from natural sources and using recycled concrete aggregate (RCA) as coarse aggregate and fine aggregate within the permissible utilization, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering and finishing as per direction of the engineer-in-charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the minimum specified cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				-
i	Concrete of M25 grade with minimum cement content of 300 kg /cum	Cum	725.13		-
	TOTAL OF GROUND WORKS				-
C	NEW TECHNOLOGIES				
1	Designing, providing, installing and fixing factory finished custom designed cold form Light Gauge Steel Framed super structure comprising of steel wall panel, trusses, purlins etc manufactured out of minimum 0.75 mm thick steel sheet as per design requirements. The steel sheet shall be galvanized (AZ-150gms Aluminium Zinc Alloy coated steel having minimum yield strength 300-550 Mpa) conforming to AISI specifications and IBC 2009 for cold formed steel framing and construction and also as per IS: 875-1987, ISO 800-1984 and IS: 801-1975. The wind load shall be as per provisions of IS 875 (part -III). LGSFS frame shall be designed as per IS: 801 using commercially available software such as Frame CAD Pro-11.7/ STAAD PRO-V8i/ArchitekV2.5.16/ Revit architecture-2011 or equivalent. Proper usage of Connection Accessories like Heavy Duty Tension Ties, Light Duty Hold-ons, Twist Straps (to connect truss with wall frames), Strong Tie, Tie Rod, H-Brackets, Boxing Sections, L-Shaped Angles for better structural stability. The framing section shall be cold form C-type having minimum web depth 89 mm x 39 mm flange x 11 mm lip in required length as per structural design requirement duly punched with dimple/slot at required locations as per approved drawings. The slots will be along centre line of webs and shall be spaced minimum 250 mm away from both ends of the member. The frame can be supplied in panelized or knock down condition in specific dimensions and fastened with screws extending through the steel beyond by minimum of three exposed threads. All self drilling tapping screws for joining the members shall have a Type II coating in accordance with ASTM B633(13) or equivalent corrosion protection of gauge 10 & 12, TPI 16 & 8 of length 20 mm. The frames shall be fixed to RCC slab or Tie beam over Neoprene rubber using self expanding carbon steel anchor bolt of dia as per approved drawings. design subject to minimum 12 mm diameter and 121 mm length conforming to AISI 304 and 316 at 500 mm c/c with minimum embedment of 100 mm in RCC (RCC to be paid separately) and located not more than 300 mm from corners or termination of bottom tracks complete in all respects. The item also includes the submission of stability reports duly examined and issued by any NIT/IIIT. The rate includes the concept design, detailed design, fabrication of sections, transportation, installation and all required fixing arrangement at site as described above	KG	43200.00		-



2a	Providing and fixing of external wall system on Light gauge steel frame work with outer face cement boards as per standard sizes fixed with selfdrilling / tapping screws / fasteners @ 60 cm c/c of approved make. A groove of 2 mm to 3 mm shall be maintained and grooves shall be sealed with silicon based sealant. The board shall be fixed in a staggered pattern. Screws shall be of counter sunk rib head of 1.60 mm to 4 mm thick or 8 to 10 gauge of length varying from 25 to 45 mm and. Internal face 12.5 mm thick gypsum plaster board fixed on cement board as per standard sizes fixed with self- drilling / tapping screws / fasteners @ 60cm c/c of approved make, proper taping and jointing to be done using fiber mesh tape and epoxy and acrylic based jointing compound for seamless finish.(cost of frame work to be paid for separately)					-
2a	Outer face- Outer face having 6 mm thick fiber cement board Type A, Category-IV as per IS:14862:2000 fixed on 9 mm thick fiber cement board, Type A, Category-IV as per IS:14862:2000 (high pressure steam cured) Inner Face- 12.5 mm thick gypsum plaster board conforming to IS 2095:2011 fixed on 8 mm thick fibre cement board of Type B, Category-III as per IS:14862:2000 (High pressure steam cured)	SQM	1001.15			-
2b	Providing and fixing in all exterior face panels breathable vapour barrier underneath the cement fiber board as per National Building Code 2009 complete as per direction of Engineer-in-charge	SQM	1001.15			-
3	Providing and fixing internal wall panels on Light gauge steel frame work with 12.5 mm thick gypsum plaster board conforming IS 2095:2011 fixed on cement board as per standard sizes fixed with self-drilling / tapping screws / fasteners @ 60 cm c/c of approved make, Screws shall be of counter sunk rib head of 1.60 mm to 4 mm thick or 8 to 10 gauge of length varying from 25 to 45 mm. Proper taping and jointing to be done using fiber mesh tape and epoxy and acrylic based jointing compound for seamless finish.(cost of frame work to be paid for separately)					-
3a	Cement Fiber Board 8 mm thick of Type B, Category III as per IS 14862:2000 (High pressure Steam Cured	SQM	2500.00			-
4	Providing and fixing roofing consist of 0.8 mm thick galvanized steel deck sheet conforming to IS 277:1992 used as permanent shuttering over which MS wire mesh 3 mm laid at 100x100 mm grid including edge trim covered with concrete. This metal deck will be supported on structural steel beam with shear studs. (Structural steel like Beam, column, joists etc. & concrete of different grade as per design will be paid separately).	SQM	1120.00			-
5	Providing corrugated G.S. sheet roofing including vertical / curved surface fixed with polymer coated J or L hooks, bolts and nuts 8 mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead, including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete (up to any pitch in horizontal/ vertical or curved surfaces), excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required. 0.63 mm thick with zinc coating not less than 275 gm/ m ²	SQM	1120.00			-
6	Bubble Sheet insulation of roof Construction Supply and installation of insulation of bubble sheet of 12mm	Sqm	1120.00			-
						-
	TOTAL OF EXTRA ITEMS IN STRUCTURE					-



Summary of Cost for Internal & External Plumbing works

S.No	Description	Amount	TOTAL AMOUNT
1	SUB HEAD I - EARTH WORKS	-	-
3	SUB HEAD III - ROOFING	-	-
4	SUB HEAD IV -SANITARY FIXTURES & ACCESSORIES	-	-
5	SUB HEAD V - WATER SUPPLY	-	-
6	SUB HEAD VI- DRAINAGE	-	-
7	Rain Water Harvesting	-	-
	GRAND TOTAL	-	-

BILL OF QUANTITIES FOR INTERNAL AND EXTERNAL PLUMBING WORK

Sl.No.	DESCRIPTION OF ITEM	UNIT	Gross Qty	RATE	Amount
SUB HEAD I - EARTH WORKS					
1	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				-
	All kinds of soil				-
	Pipes, cables etc. , NOT exceeding 80 mm dia.	RMT	80		-
	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia	RMT	300		-
					-
					-
	SUB TOTAL				-
SUB HEAD III - ROOFING					
2	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1 m x1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3 coarse sand) and a coat of neat cement, rounding the edges and making and finishing the outlet complete.	Each	1		-
3	Providing and fixing 100 mm diameter and 60 cm long rain water spout in cement mortar 1:4 (1 cement : 4 fine sand).	Each	2		-
	Stone ware spout				-
4	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion, (i) Single socketed pipes.				-
	75 mm diameter	RMT	20		-
	110 mm diameter	RMT	210		-
5	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.				-
	Coupler- 110 mm	Each	15		-
	Bend 87.5°				-
	110 mm bend	Each	15		-
					-
					-
6	Providing and fixing unplasticised -PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50 mm hard wood plugs, screwed with M.S. screws of required length, including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete.				-
	75 mm	Each	5		-
	110 mm	Each	35		-
	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	Each	13		-
					-
	SUB TOTAL				-
SUB HEAD IV -SANITARY FIXTURES & ACCESSORIES					
7	Providing and fixing white vitreous china extended wall mounting water closet of size 780x370x690 mm of approved shape including providing & fixing white vitreous china cistern with dual flush fitting, of flushing capacity 3 litre/ 6 litre (adjustable to 4 litre/ 8 litres), including seat cover, and cistern fittings, nuts, bolts and gasket etc complete.	each	16		-



8	Providing and fixing white vitreous china squatting pan (Indian type W.C. pan) with 100 mm sand cast iron P or S trap, 10 litre low level white PVC flushing cistern, including flush pipe, fittings & fixtures, cutting and making good the walls and floors wherever required, complete in all respects.	each	6		-
9	Health Faucet :- SITC of Health faucet with 8mm Dia, 1.2mtr Flexible Tube, wall Hook, Make - Jaguar Mode No - ALD-577	each	16		-
10	Providing and fixing PTMT liquid soap container 109 mm wide, 125 mm high and 112 mm distance from wall of standard shape with bracket of the same materials with snap fittings of approved quality and colour, weighing not less than 105 gms.	each	20.00		-
11	Providing and fixing white vitreous china flat back or wall corner type lipped front urinal basin of 430x260x350 mm and 340x410x265 mm sizes respectively with automatic flushing cistern with standard flush pipe and C.P. brass spreaders with brass unions and G.I clamps complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required :				-
	One urinal basin with 5 litre white P.V.C. automatic flushing cistern	each	12		-
12	Providing and fixing one piece construction white vitreous china squatting plate with an integral longitudinal flushing pipe, white P.V.C. automatic flushing cistern, with fittings, standard size G.I. / PVC flush pipe for back and front flush with standard spreader pipes with fittings, G.I clamps and C.P. brass coupling complete, including painting of fittings and cutting and making good the walls and floors etc. wherever required :				-
	Single squatting plate with 5 litre P.V.C. automatic fl cistern	each	2		-
13.0	Providing ,Fixing, testing and commissioning of vitreous china white flat back Wash basin, Aluminium angle brackets duly painted, CP brass waste, CP brass chain with rubber plug, 32 mm diameter CP cast brass bottle trap with CP extension piece (to be supplied by the contractor) and union complete, including nuts, washers, cutting and making good the granite counter/walls/floors wherever required				-
	Model -Thin Trim Table Top Basin (IDS-WHT-25909)	each	18.00		-
14.00	Providing ,Fixing, testing and commissioning of 15 mm dia C.P. brass Pillar Tap with C.P. wall flange of approved quality .	each	18.00		-
	Model - Opal Prime Pillar Tap				-
15.00	Providing and fixing CP Brass 32 mm size Bottle Trap of approved quality & make and as per the direction of Engineer-in-charge.	each	18.00		-
16.00	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931				-
	15 mm nominal bore	each	75.00		-
17.00	P/F Automatic Hand Dryer suitable to operate on 220 volts, 50 Hz, 2500w, 9000 RPM motor including cutting and making good the walls wherever required complete in all respect.	Nos.	8.00		-
18	Providing and fixing PTMT soap Dish Holder having length of 138 mm, breadth 102 mm, height of 75 mm with concealed fitting arrangements, weighing not less than 106 gms.	each	10.00		-
19.00	Providing and fixing CP Brass Toilet paper Holder	Nos.	20.00		-
	SOIL , WASTE & VENT PIPES AND FITTINGS - SWR				-
20	Providing, fixing, jointing and testing in position of ISI marked UV stabilized UPVC pipes for soil, waste, rain water and vent, Type-B as per IS : 13592 suitable for rubber ring joints for vertical pipes and solvent cement joints for horizontal pipes, including all necessary specials and fittings (conforming to IS:14735) i.e. bends, tees, junctions (with or without doors), reducers, WC connectors, couplers, cowels, clamps, long radius / swept bend at bottom of pipe, (All connections from horizontal to vertical stacks must be through swept type fitting) hangers, rubber rings, clean outs, C.P Grating for any waste connection from washing machine etc. fixing at wall / ceiling / floor level supported by clamp & hangers etc. inside duct / suspended from floor under false ceiling for proper completion of the work. The rubber ring shall confirm to IS:5382.				-
	The Pipes will be supported by either G.I. U strap clamps on 40x40x3 mm G.I. slotted angle duly painted (for a group of pipes) or G.I. rubber lined split clamp (for independent pipes). The cost will include all support arrangements. The work includes cutting holes in wall/ floors/ slabs and making good the same with cement concrete 1:2:4 complete as required. The work includes commissioning of all pipes lines as per drawings and specifications and as directed by engg-in-charge at site.				-
	110 mm dia (Wall Thickness - 3.2 to 3.8 mm)	RM	220		-
	75 mm dia (Wall Thickness - 3.2 to 3.8 mm)	RM	65		-
	50 mm dia (Wall Thickness - 3.2 to 3.8 mm)	RM	20		-
	40 mm dia (Wall Thickness - 3.2 to 3.8 mm)	RM	45		-
21	Providing and fixing of UPVC Floor Traps with CP Jali formed out of bore 'P' trap with 50 mm water seal, setting in 1:2:4 mix cement concrete block or clamping to the wall or suspending with the ceiling including cutting and making good the walls and floors wherever required.				-
22	P-Trap type Floor Trap 110 x 110 mm (Long type - 50 mm seal)	Each	16		-
23	Providing and fixing of drain point with 75 mm dia. Bend with CP Jali complete in all respects.	Each	14		-
24	Providing and fixing UPVC clean out plug Floor with opening arrangements for soil / waste pipe and other necessary fittings including jointing, all complete as per standard detail.	Each	18		-
					-
	SUB TOTAL				-
	SUR HEAD V - WATER SUPPLY				-
25	Providing, fixing chlorinated polyvinyl Chloride (CPVC) pipes , having thermal stability for hot and cold water supply including all CPVC plain and brass threaded fittings including fixing the pipes with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in charge.				-
	Concealed work including cutting chase and making good the wall etc.				-
	20 mm nominal outer dia pipes	metre	400		-



	25 mm nominal outer dia pipes	metre	35		-
26	Providing, fixing chlorinated polyvinyl Chloride (CPVC) pipes , having thermal stability for hot and cold water supply including all CPVC plain and brass threaded fittings including fixing the pipes with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in charge.				-
	Internal Work - Exposed on wall				-
	25 mm nominal outer dia pipes	meter	30		-
	32 mm nominal outer dia pipes	meter	20		-
	40 mm nominal outer dia pipes	meter	45		-
	65 mm nominal outer dia pipes	meter	15		-
27	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge.				-
	External work				-
	40 mm nominal dia Pipes	metre	80		-
	50 mm nominal dia Pipes	metre			-
	65 mm nominal dia Pipes	metre			-
	80 mm nominal dia Pipes	metre			-
	100 mm nominal dia Pipes	metre			-
	150 mm nominal dia Pipes	metre			-
28	Providing & fixing C.I butterfly valve (upto 150mm dia with hand lever operation & above with gear box operation). Tested to a pressure not less than 16 Kg/Sq.cm. Including rubber gasket, flanges, nuts, bolts, washers & painting complete as required.				-
	50 mm dia	No.			-
29	Providing and fixing gate valve with CPVC . of approved quality				-
	20 mm nominal bore	Each	2		-
	25 mm nominal bore	Each	1		-
	32 mm nominal bore	Each	2		-
	40 mm nominal bore	Each	1		-
30	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete :				-
	20 mm nominal bore	Each	10		-
	25 mm nominal bore	Each	2		-
	32 mm nominal bore	Each	2		-
	40 mm Nominal Bore	Each	2		-
31	Providing and fixing uplasticsised PVC connection pipe with brass unions :				-
	45 cm length				-
	15 mm nominal bore	Each	75		-
32	Providing and fixing C.P. brass shower rose with 15 or 20 mm inlet :				-
	100 mm diameter	Each			-
33	Providing & fixing in position 25 mm dia lawn hydrants consisting of 25 mm dia Ball valve, GI nipple and threaded hose receiver complete as required.	No.	2		-
34	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design :				-
	With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	Each	1		-
35	Constructing masonry Chamber 60x60x75 cm, inside in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for fire hydrants, with C.I. surface box 350x350 mm top and 165 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand:10 graded stone aggregate 40 mm nominal size) and inside plasteringwith cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design :				-
	With common burnt clay F.P.S.(non modular) bricks of class designation 7.5				-
36	Providing and fixing C.P. brass bib cock of approved quality conforming to IS:8931				-
	15 mm nominal bore.	Each	4		-
37	Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standards and weighing not less than 690 gms.				-
	15 mm nominal bore.	Each	2		-
37	Providing and fixing C.P. Brass extension nipple (size 15mmx50mm) of approved make and quality as per direction of Engineer-in-charge.	Each	2		-
38					-
39	Water Tanks :- Providing & Fixing PVC Water tank with 2 nos inlet at top & outlet at bottom. Tank should have float valve, Manhole & brass MT. Make - Syntax or Equivalent				-
	2000 Liter	Each	2		-
	5000 Liter	Each	2		-
					-
	SUB TOTAL				-
	SUB HEAD VI - DRAINAGE				-
40	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) all-round S.W. pipes including bed concrete as per standard design :				-
	250 mm diameter pipe	metre	250		-



41	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) up to haunches of S.W. pipes including bed concrete as per standard design :				-
	100 mm diameter pipe	metre			-
	150 mm diameter pipe	metre			-
	200 mm diameter pipe	metre			-
	250 mm diameter pipe	metre	250		-
	300 mm diameter pipe	metre			-
42	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design:				-
	100x100 mm size P type				-
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	Each	2		-
43	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :				-
	150 mm dia. R.C.C. pipe	meter			-
	250 mm dia. R.C.C. pipe	meter			-
	200 mm dia. R.C.C. pipe	meter	250		-
	300 mm dia. R.C.C. pipe	meter			-
	450 mm dia. R.C.C. pipe	meter			-
43	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) R.C.C. top slab with 1:2.4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size) inside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement complete as per standard design :				-
44	Inside size 60x60 cm and 75 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) With Sewer bricks conforming to IS : 4885	Each	3		-
45	Inside size 30x30 cm and 75 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) With Sewer bricks conforming to IS : 4885	Each			-
46	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) cement plastered on both sides with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement and making necessary channels for the drain etc. complete :				-
	For pipes 100 to 250 mm diameter	Each	40		-
	For pipes 350 to 450 mm diameter	Each	7		-
47	Constructing brick masonry road gully chamber 50x45x60 cm with bricks of in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame complete as per standard design :				-
	With common burnt clay F.P.S. (non modular) bricks class designation 7.5.	Each	1		-
48	Constructing brick masonry road gully chamber 50x45x60 cm with bricks of in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame complete as per standard design :				-
	30X30X60cm	Each	1		-
49	Construction of road gully chamber / Catchbasin with SFRC grating (heavy duty HD-20 grade designation) of the following sizes in brick work with bricks of class 75 in cement mortar 1:4 (1 cement : 4 fine sand) necessary foundation concrete(1:4:8). Inside & outside plastering 12 mm thick with cement mortar 1:3 with a floating coat of neat cement. Including the RCC top slab for fixing the grating including necessary excavation, dewatering, refilling, watering, ramming, removing, the surplus excavated material and making good the same complete as required.				-
	Internal size 300 x 300 x 600 mm average depth	No.	1		-
	Internal size 600 x 600 x 600 mm average depth	No.	9		-
	Internal size 900 x 800 x 900 mm average depth	No.	5		-
	Internal size 1200 x 900 x 900 mm average depth	No.			-
50	Extra for depths for manholes, including brick work, inside and outside plastering, finished with a floating coat of neat cement from inside, foot rest, excavation, refilling, disposal of surplus earth in all kinds of soil including centering and shuttering.				-
	For Manhole size 600 x 600 mm	RM	3		-
	For Manhole size 900 x 800 mm	RM	2		-
	For Manhole size 1200x 9 000 mm	RM	1		-
	For Circular Manhole size 1.2m dia	RM	1		-
51	Making soak pit 2.5 m diameter 3.0 metre deep with 45 x 45 cm dry brick honey comb shaft with bricks and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design.				-
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	each	1		-
					-
					-
	SUB TOTAL				-

SCHEDULE OF QUANTITIES FOR RAIN WATER HARVESTING PITS (Structure in Brickwork)						
PROJECT : SAHITYA PARK						
PART A						
SNo	DESCRIPTION	MR	QTY	UNIT	RATE (Rs.)	AMOUNT (Rs.)
A	RAIN WATER HARVESTING PITS					
MR-22	<u>Rain Water Harvesting system :</u>					
	Construction of rain water harvesting size 3000x2500 MM dia & 3500 Mm effective depth + Invert for the re-charging of storm water run off including the civil work with following specification Construction of Chamber.					
	<u>De-Silting Chamber:</u>					
	Providing and constructing masonry de-silting chamber 2000mm x 1000mm with required depth inside with 75 class designated brick work in cement mortar 1:6 (1cement : 6 fine sand) with C.I double seal medium duty 560mm dia manhole cover (2Nos.). top slab 1:2:4 mix (1cement : 2coarse sand : 4 graded stone aggregate 20mm nominal size) with minimum 1.5% reinforcement, foundation concrete 1:5:10 (1cement : 5 fine sand:10 grade stone aggregate 20mm nominal size including baffle wall, necessary excavation, back filling and disposal of surface earth. Complete with inlet, outlet and overflow arrangement. Foot rest @400mm c/c, grating of required size with 16mm sq.bars and frame @20mm clear spacing fixed at month of pipe as per site conditions and direction of Engineer in charge					
	<u>Drilling:</u>					
	Drilling percolation borehole 300mm dia with reverse rotary method/ direct rotary method (to be decided by the vendor as per soil strata) in all types of soil up to 100 m (approx.) depth including cost for mobilization of rig and making good the area upon completion of work. Contractor shall arrange for all necessary tools, water and consumable and laying for drilling.					
	Providing and laying pea gravel all around the casing pipe.					
	160 mm dia slotted UPVC pipe of 6 Kg/cm ² - 35 m -40m or as per site sub-strata or set as per direction of Engineer- in charge					
	160 mm dia UPVC blind pipe of 6 Kg/cm ² .					
	<u>Rain Water Harvesting Well Filtration Chamber:</u>					



	<p>Providing and constructing rain water harvesting well/filtration chamber of size 3.5m dia x 3.5m eff. depth or as per approved drawings inside with 75 class designated brick work in cement motor 1:6 (1cement : 6 fine sand) with 560mm dia C.I double seal medium duty manhole cover with top slab 1:2:4 mix (1cement : 2 course sand :4 graded stone aggregate 20mm nominal size) with minimum 1.5% reinforcement , foundation concrete 1:5:10 (1cement : 5 fine sand and 10 graded stone) aggregate 20mm nominal size including 300mm depth Boulder 10-20mm, 300mm depth gravel 5-10mm size, 300mm depth coarse sand 1.5-2.0mm size including necessary excavation, back filling and disposal of surface earth complete with inlet, outlet, overflow arrangement pvc coated Foot Rest, 100mm dia deep holes @500mm c/c to be provided 1200 c/c above the bottom of wall, 100mm C.I vent pipe -2m height with cowls.</p>					
	<p>Rate shall include excavation, back filling and all other operations necessary for completing the job.</p>					
	<p>Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12 mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mm x 25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30 x 20 x 15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per design.</p>					
	<p>Making connection of storm water line with external manhole including breaking into and making good the walls, floors with cement concrete 1:2:4 mix (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size) cement plastered on both sides with cement mortar 1:3 (1cement: 3 Coarse sand) finished with a floating coat of neat cement and making necessary channels for the drain etc. complete.</p>					
	<p>As described above</p>			<p>1.0000</p>		<p>-</p>
						<p>-</p>



HVAC SUMMARY		
No.	Description	ACTUAL AMOUNT
1.00	EQUIPMENT & LOW SIDE	-
HVAC TOTAL		-

General Notes:-

1. All work shall be in accordance with the requirements of the Authority/Landlord.

2. All work shall be pre approved by Consultant or Site Manager.

3. Work shall be carried out during the fit out period as per instructions from Authority/Landlord.

4. The rate for each item of work included in the Schedule of Quantities shall, unless expressly stated otherwise, include cost of :

a. All materials, fixing materials, Loading , unloading , Shifting accessories, appliances tools, plants, equipment, transport, labour and incidentals required in preparation and testing, balancing & commissioning as per Specifications and Drawings.

b. Liabilities, obligations and risks arising out of Conditions of Contract.

c. All requirements of Specifications, whether such requirements are mentioned in the item or not. The Specifications and Drawings where available, are to be read as complimentary to and part of the Schedule of Quantities and any work called for in one shall be taken as required for all.

SL.NO.	DESCRIPTION	RATES	UNIT	QTY	ACTUAL AMOUNT
1 EQUIPMENT & LOW SIDE					
1	Supply, installing, testing and commissioning of wall mounted HI WALL / CASSETTE / DUCTABLE air cooled split air conditioning units as described in specifications. The unit shall be complete with decorative type fan coil unit and external condensing unit, complete in all respects, inclusive of copper refrigerant piping, drain connection to pipes , valves , Outdoor Stand and Class O insulation with Fibre Cloth. Quoted price shall include cost of cooling thermostat/remote , power wiring, control wiring and earthing. The unit capacities shall be as follows:				
	Note : Fins and copper tubes of Air Cooled Condenser alongwith copper tubing / piping with all joints and U-Bends , Gas charging with design pressure etc				
1.1	2.0 TR Cassette AC split air conditioning system Inverter 5 Star		No.	7	-
1.2	3 TR Cassette AC split air conditioning system Inverter 5 Star		No.	18	-
1.3	4 TR Cassette AC split air conditioning system Inverter 5 Star		No.	18	-
	Note : Refrigerent shall be R32 or equivalent				
2	Aluminum Powder Coated Grill /Diffusers - Supply and fixing of powder coated aluminum extruded Supply/Round air round diffuser .The neck sizes are as follows. The diffuser size shall be higher in 75 mm in either side than neck size as per drawing etc., complete as specified.		SqMt		-
3	Supply, installation, testing and commissioning of Inline fans with motor complete in all respect & of following capacities. The casing of inline fans shall be acoustically lined & shall be selected for lower noise level. Fan motor shall have inbuilt speed controller.				
3.1	650 CFM (20 mm static pressure, single phase) circular fan suitable for 220±6% volts 50 cycles, 1 phase AC supply -- Toilet Exhaust		No.	2.00	-
3.2	350 CFM (20 mm static pressure, single phase) circular fan suitable for 220±6% volts 50 cycles, 1 phase AC supply -- Toilet Exhaust		No.	2.00	-
4.0	AC Unit Drain Pipe - Supply installation testing & commissioning of PVC for AC Drain Piping defined in ASTM D1785 and ASTM D2665 as applicable. with 9 mm thick nitrile rubber insulation and fibre wrap with Protective Coating (Fixing of pipe including with all necessary arrangement) as per drawing etc., complete as specified.				-
4.1	15mm Drain pipe		RMT		-
4.2	25 mm drain pipe		RMT	410.00	-
4.3	32mm Dia Pipe		RMT	500.00	-
5.0	Supply, installation and testing of Site fabricated GI sheet metal ducts as per BIS standard in accordance with the approved shop drawings and as required by the specifications.				
5.1	26 gauge galvanised sheet steel (Duct Size upto 450 mm)		SqMt		-
5.2	24 gauge galvanised sheet steel (Duct Size 450 -750 mm)		SqMt	80	-
5.3	22 gauge galvanised sheet steel (Duct Size 751-1500mm)		SqMt		-
5.4	20 gauge galvanised sheet steel (Duct Size 1501-2200mm)		SqMt		-
5.5	18 gauge galvanised sheet steel (Duct Size above 2200mm)		SqMt		-
6	Supply, installation, testing and balancing of Powder Coated Extruded Aluminium Toilet Grill (150 X 150) complete with air pattern controllers		No.	38	-
7	Supply, installation, testing and balancing of Powder coated/Anodised extruded aluminium construction louvers with bird screen for exhaust air as per specifications and approved drawings.		Sqm.	0.4	-
8	Supply, installation, testing and commissioning Powder Coated Extruded Aluminium Air transfer door grilles with rear side frame as per approved shop drawings.		Sqm.	1.2	-
9	Supply, fabrication, installation and testing the flexible connections constructed of fire resistant double resin sleeve at Ductable and Inline Fans as per the approved shop drawings.		Nos	4	-
TOTAL FOR EQUIPMENT WORKS					-



SUMMARY OF COST FOR INTERNAL ELECTRICAL WORKS

S.No	DESCRIPTION				AMOUNT (RS) MARKET(MR)
A.	CIRCUIT CUM POINT WIRING IN PVC CONDUIT				-
B.	DISTRIBUTION BOARDS & MCB's				-
C.	SUPPLY & INSTALLATION OF CABLES, MAINS AND				-
D.	TERMINATION CABLE				-
E.	CABLE TRAYS, RACEWAY & JUNCTION BOXES:				-
F.	EARTHING SYSTEM				-
G.	SUPPLY & INSTALLATION OF LIGHT FIXTURES, FANS				-
H.	SUPPLY & INSTALLATION OF LT PANELS				-
I.	SUPPLY & INSTALLATION OF UPS SYSTEM				-
J.	CONDUITING WIRING AND CABLING FOR VOICE /				-
K.	CONDUITING WIRING AND CABLING FOR CCTV SYSTEM				-
L.	FIRE DETECTION AND ALARM SYSTEM				-
	TOTAL INTERNAL ELECTRICAL WORKS INCLUDING GST				-
S.No	DESCRIPTION	UNIT	Qty	RATE	AMOUNT
A.	CIRCUIT CUM POINT WIRING IN PVC CONDUIT				
1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				-
1.1	Group B	Point	347		-
2	Wiring for group controlled (looped) light point/fan point/exhaust fan point/call bell point (without independent switch etc.) with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed PVC conduit, and earthing the point with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				-
2.1	Group B	Point	332		-
3	Wiring for the following light points with 1.5 sq.mm PVC insulated copper conductor 1100 volts grade stranded flexible FRLS wires of approved make in concealed or surface mounted 25 mm dia 16 gauge MS Conduit including providing and controlled by SPMCB provided in the DB. (Cost of MCB not to be included here).				-
3.1	Primary point controlled by one MCB .	Point	15		-
3.2	Same as item above but Secondary point. i.e. Points to be looped with Primary point.	Point	95		-
4	Wiring for light/ power plug with 2X4 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit along with 1 No. 4 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable for loop earthing as required.	Meter	200		-
5	Wiring for circuit/ submain wiring along with earth wire with the following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required.				-
5.1	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	Meter			-
5.2	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	Meter	3100		-
5.3	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	Meter			-
6	Supplying and fixing two module stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	Each	175		-
7	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	Each	55		-
8	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 A modular socket outlet and 5/6 A modular switch, connections etc. as required.	Each	143		-



9	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 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	Each	74		-
					-
10	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing weatherproof 6 pin 5/6 A & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	Each	4		-
					-
11	Supplying & fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 25 A modular socket outlet and 25 A modular SP MCB, "C" curve including connections, painting etc. as required.	Each			-
					-
TOTAL OF INTERNAL WIRING					
					-
B	DISTRIBUTION BOARDS & MCB's				
1	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				-
1.1	8 way, Double door	Each	2		-
1.2	12 way, Double door	Each	2		-
					-
2	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/ Isolator)				-
2.1	8 way (4 + 24), Double door	Each			-
2.2	12 way (4 + 36), Double door	Each	4		-
					-
3	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				-
3.1	Single pole	Each	178		-
3.2	Double Pole	Each	4		-
					-
4	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	Each	48		-
					-
5	Supplying and fixing following rating, four pole, 415 V, MCB(10kA) in the existing MCB DB complete with connections, testing and commissioning etc. as required.				-
5.1	40A	Each			-
5.2	63A	Each	4		-
					-
6	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required.				-
6.1	25A	Each	2		-
6.2	32A	Each	2		-
6.3	63A	Each	12		-
					-
7	Supplying and fixing Cable End Box (Loose wire box)(IP 43) suitable for following single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with testing and commissioning etc. as required.				-
7.1	For 8 way, Double door SPN MCBDB	Each	2		-
7.2	For 12 way, Double door SPN MCBDB	Each	2		-
					-
8	Supplying and fixing Cable End Box (Loose wire box)(IP 43) suitable for following triple pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with testing and commissioning etc. as required.				-
8.1	For 8 way, Double door TPN MCBDB	Each			-
8.2	For 12 way, Double door TPN MCBDB	Each	4		-
					-



9	Supplying and fixing DP sheet steel enclosure on surface/ recess along with 25/32 A 240 V "C" curve DP MCB complete with connections, testing and commissioning etc. as required.	Each			-
					-
10	Supplying and fixing polycarbonate weatherproof enclosure on surface/ recess along with 25/32 A 240 V "C" curve DP MCB complete with connections, testing and commissioning etc. as required.	Each	7		-
					-
11	Enclosures Box for indoor application (for UPS). Supplying and fixing DP sheet steel enclosure on surface/ recess along with 63 A 240 V "C" curve DP MCB complete with connections, testing and commissioning etc. as required.	Each	1		-
					-
12	Enclosures Box for out door application (for AC O/D UNIT). Supplying and fixing Polycarbonate weatherproof enclosure on surface/ recess along with 32A 415 V "C" curve 4Pole MCB complete with connections, testing and commissioning etc. as required.	Each	36		-
					-
TOTAL OF DISTRIBUTION BOARDS & MCB's					
					-
C.	SUPPLY & INSTALLATION OF CABLES, MAINS AND SUB MAINS				
1	Supplying of following 1100 volt grade XLPE insulated PVC sheathed aluminium conductor armoured cables as per specification in existing trenches, cable trays, ducts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning.				-
1.1	3.5 core 240sq. mm	Meter	440		-
1.2	3.5 core 185 sq. mm	Meter	35		-
1.3	3.5 core 120 sq. mm	Meter	220		-
1.4	3 core 25 sq. mm	Meter	30		-
1.5	4 core 16 sq. mm	Meter	210		-
					-
2	Supplying of following 1100 volt grade XLPE insulated PVC sheathed copper conductor armoured cable as per specification in existing trenches, cable trays ducts, clamped includes anchor fastners to wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning.				-
2.1	3 core 4 sq.mm	Meter	190		-
2.2	3 core 6 sq.mm	Meter	20		-
2.3	4 core 4 sq.mm	Meter	1500		-
					-
3	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.				-
3.1	Above 185 sq. mm and upto 400 sq. mm	Meter	440		-
					-
4	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.				-
4.1	Above 95 sq. mm and upto 185 sq. mm	Meter	255		-
					-
5	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.				-
5.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	Meter	1950		-
					-
6	Providing, laying and fixing following dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc as required.				-
6.1	150 mm dia	Meter	15		-
					-



7	Designing and constructing brick masonry manhole chamber of the following size in brick work of class 75 in cement mortar 1:4 (1cement:4 fine sand), R.C.C. top slab with 1:2:4 mix (1cement : 2 coarse sand :4 graded stone aggregate 20mm. nominal size) RCC foundation slab 1:2:4 mix (1 cement : 2 coarse sand:4 graded stone aggregate 40 mm nominal size) both inside and outside cement plastering 12 mm thick with cement mortar 1:3 (1cement :3 coarse sand) finished with a floating coat of neat cement on inside face, including necessary centering and shuttering, reinforcement, excavation, in all kind of soil, dewatering, refilling, watering, ramming and removing the surplus excavated earth, making good the same complete as required. Contractor shall submit the structural design and drawings for the approval of Project Manager prior to execution including SFRC Cover and 560 mm internal diameter conforming to IS 12592, total weight of cover and frame to be not less than 182 Kgs fixed in cement concrete 1:2:4 (1 cement, 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)					-
7.1	Inside size 600 x 600 mm	Each	2			-
						-
	TOTAL OF CABLES					-
						-
D	TERMINATION CABLE					
1	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					-
1.1	3½ X 240 sq. mm (62mm)	Each	4			-
1.2	3½ X 185 sq. mm (57mm)	Each	2			-
1.3	3½ X 120 sq. mm (45mm)	Each	2			-
1.4	3 X 25 sq. mm (25mm)	Each	4			-
1.5	4C X 16 sq. mm (28mm)	Each	8			-
						-
2	Supplying and making end termination with brass compression gland and copper lugs for following size of PVC insulated and PVC sheathed / XLPE copper conductor cable of 1.1 KV grade as required.					-
2.1	3C X 4 sq. mm (25mm)	Each	6			-
2.2	3C X 6 sq. mm (25mm)	Each	2			-
2.3	4C X 4 sq. mm (25mm)	Each	36			-
						-
	TOTAL OF TERMINATION CABLE					-
						-
E.	CABLE TRAYS, RACEWAY & JUNCTION BOXES:					
	PERFORATED TRAYS					-
1	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.					-
1.1	100 mm width X 50 mm depth X 1.6 mm thickness	Meter	70			-
1.2	150 mm width X 50 mm depth X 1.6 mm thickness	Meter	350			-
1.3	300 mm width X 50 mm depth X 1.6 mm thickness	Meter	55			-
1.4	450 mm width X 50 mm depth X 2.0 mm thickness	Meter	15			-
1.5	600 mm width X 50 mm depth X 2.0 mm thickness	Meter	110			-
1.6	750 mm width X 62.5 mm depth X 2.0 mm thickness	Meter	10			-
						-
2	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "bends" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.					-
2.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each	4			-
2.2	150 mm width X 50 mm depth X 1.6 mm thickness	Each	15			-
2.3	300 mm width X 50 mm depth X 1.6 mm thickness	Each	1			-
2.4	450 mm width X 50 mm depth X 2.0 mm thickness	Each	0			-
2.5	600 mm width X 50 mm depth X 2.0 mm thickness	Each	5			-
						-
3	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Tee" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.					-
3.1	300 mm width X 50 mm depth X 1.6 mm thickness	Each	1			-
						-
	TOTAL OF CABLE TRAY					-
						-



F. EARTHING SYSTEM					
1	Earthing with G.I. earth pipe 4.5 Meter long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	Set	0		-
2	Providing, laying, testing and commissioning of earthing pits with inspection chamber using required qty of ISO GEL (Chemical to enhance earth bonding improving compound) using GI earth electrode of tube/rod of 3 Mtrs Length & 80mm dia including cover etc as required.	Set	4		-
3	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	Meter	140		-
4	Providing and fixing 25 mm X 3 mm G.I. strip on surface or in recess for connections etc. as required.	Meter	300		-
5	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.	Meter	125		-
6	Rubber Mat for Panel - Supply & fixing of following safety items in Electrical room 1.1KV Grade 2 mtr x 1 mtr x 10 mm thick rubber mat in electrical room.	Unit	2		-
7	Supply and fixing of in-position the fire extinguishers dry chemical power (ABC) 2 kg capacity.	No.	2		-
TOTAL OF EARTHING SYSTEM					
G. SUPPLY & INSTALLATION OF LIGHT FIXTURES, FANS & EXHAUST FAN					
Note:-The model numbers specified below are only for references for Shape of the product requirement. The product shall supplied, must match the technical specifications. The technical data sheets shall be arranged before the material dispatch and got approved from engineer-in-charge.					
1	Supply, Receiving, storing, handling, installation & commissioning of following lighting fixtures with correct assigned position, making proper connections, testing and commissioning of the following lighting fixtures with all fixing accessories etc. as required or approved makes:				-
1.1	LED Down lighter (SMD Type) (System lumen efficacy $\geq 120 < 135 \text{lm/Watt}$) Supplying, installation, Testing & Commissioning of LED Recessed/surface Down lighter (Round/ square/ Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -5 0C to 40 0C centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection, THD < 10%, P. F. ≥ 0.95 , IP20, CRI >80, UGR (Unified Glare Rating) <19, Flicker free (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), life time of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K / 6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard. Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing Complete in all respect i/c external connections with 1.5 sq mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy $\geq 120 < 135 \text{lm/Watt}$ output. LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted.. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C). Powder coated die cast /Extruded aluminium Body including trim.				-
1.1.1	12 -15 watt	Each	144		-
	LED Down lighter (COB Type) (System lumen efficacy $\geq 120 \text{lm/Watt}$)				-



1.2	Supplying, Installation, Testing & Commissioning of LED Recessed/surface Down lighter (Round / square/ Rectangular) COB Type of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -5 0C to 40 0C, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19, Flicker free (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), life time of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K /6500°K (As per ANSI Bin), SDCM(Standard Deviation Colour Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard. Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. "complete in all respect i/c external connections with 1.5 sq mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted Shape size and CCT shall be as approved by Engineer-in- Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C). Powder coated die cast /Extruded aluminium Body including trim with Aluminium Reflector				-
1.2.1	12 -15 watt	Each	60		-
1.3	LED Panel light 2x2 ft. (System lumen efficacy ≥120 <135 lm/Watt)				-
	Supplying, Installation, Testing & Commissioning of Panel light 2x2 ft., of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -5 0C to 40 0C, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) <19, Flicker free, (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K /6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard. Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c external connections with 1.5 sq mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output .LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in- Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).				-
	Powder Coated CRCA Sheet Body (Thickness >0.50 mm)				-
1.3.1	36watt	Each	356		-
	LED Batten light (System lumen efficacy ≥120 <135 lm/Watt)				-



1.4	Supplying, installation, Testing & Commissioning of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85%, Operating voltage AC 140- 270 Volt, frequency 50/60 hz, Operating temp range -5 0C to 40 0C, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, Flicker free (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), of minimum 50000 Burning Hours with 70% of initial Lumen maintained till lifeends, CCT 3000°K / 4000°K / 5700°K /6500°K (As per ANSI Bin), SDCM(Standard Deviation Colour Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard. Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c external connections with 1.5 sq.mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).				-
	Powder Coated CRCA Sheet Body (Thickness > 0.50 mm)				-
1.4.1	24 -26watt	Each			-
1.5	Supplying, installation, Testing & Commissioning of 2ft length,10W LED Mirror luminaire wall mounted delivering minimum system lumen of 1000 lumens & the luminaire shall be with system efficacy 100lm/W.The luminaire Housing shall be made of extruded aluminium & the diffuser shall be of PMMA/PC. The operating CCT shall be 4000K with CRI of ≥80, SDCM<5. The luminaire shall be with BIS Registered electronic driver with input voltage range of 150 to 270V,THD≤10% & PF≥0.95.LED Life with L70 Criteria should be 50,000hours. IP20 protection.The LED Driver shall be easily available in India for repair and service. The LED shall be SMD type. Luminaire shall have minimum surge protection of 2.5KV. The luminaire shall be with following certifications: LM79 & LM80 issued by LED manufacture along with Photo Biological Safety Standard etc complete as required as approved	Each	22		-
1.6	Supply, Installation, Testing and Commissioning of ceiling fan (High Speed) with fan i/c external connections with 1.5 sq.mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required.				-
1.6.1	1200mm dia	Each	175		-
1.7	SITC of 300mm dia sweep PVC body, 900±10% RPM Exhaust fan with guard and mounting arrangement etc complete as required as approved by client/arch..	Each	9		-
TOTAL OF INSTALLATION OF LIGHT FIXTURES, FANS & EXHAUST FAN					-
H. SUPPLY & INSTALLATION OF LT PANELS					
	Design,installation , fabrication, assembling, testing , commissioning and supply of Main LT panel, Main Distribution Panels and Sub Distribution panels suitable for 415 V, 3 phase, 50 Hz, 4 wire power supply system.				-
	Panels shall be fabricated out of 2 mm thick CRCA sheet steel in cubical formation, compartmentalized in Form 3b Construction, floor mounted, free standing and shall be dust and vermin proof. 3 mm thick cable gland plate, shall be provided both at the top and the bottom of the panel.All large panels shall be provided with lifting hooks. Distribution panels shall be fabricated in accordance with the specifications.				-
1	MDB MAIN PANEL (ELECTRICAL ROOM)				-
1.1	INCOMING-1 FROM EB SUPPLY				-
A	Section 1				-



	630Amps 4pole MCCB (25KA) with built in microprocessor based over current / short circuit and earth fault microprocessor releases with 630 Amps 4pole Contractor phase indicating & auto manual switch etc with following accessories.				-
	1 Set				-
i.	Multifunctional meter (conserve – EM 6400 or equivalent) of accuracy class-I, with 3 Nos. 630/5 amps 15VA CTs to measure and display the following electrical quantities:				-
a.	Total active energy (KWH/MWH)				-
b.	Maximum demand (KVA/MVA) (KW/MW)				-
c.	Current				-
d.	Instantaneous power factor				-
e.	Voltage				-
f.	Frequency				-
					-
ii.	Phase indicating light through 415/ $\sqrt{3}$: 110V/ $\sqrt{3}$ PT, Primary/ Secondary of PT's shall be protected by 2 amps MCB's.				-
	1 Set				-
iii.	Breaker ON / OFF / TRIP indicating lights with control MCB's and fuse.				-
	1 Set				-
iv.	Under/ over voltage Relay/Digital				-
	1 Set				-
v.	Earth fault protection Relay				-
	1 Set				-
vi.	24 V DC Shunt trip coil.				-
	1 Set				-
vii.	Phase sequence relay.				-
	1 Set				-
viii.	SPD CLASS-2 TYPE (20kA)				-
	1 Set				-
ix.	PLC controller with auto load Management and interlocking features Shall be considered.				-
	1 Set				-
x.	Auto-manual / test selector / switch				-
	1 Set				-
B	Bus Bars: (Main)				-
i.	800 amps TPN (25 KA) aluminium bus bars with coloured heat shrinkable insulated sleeve.				-
	1 Set				-
C	Bus Coupler – I : Breaker 'D'				-
	630 Amps 4pole Contractor phase indicating & auto manual switch etc with following accessories.				-
	1 Set				-
D	Outgoing:				-
i.	320 amps TPN MCCB with built in microprocessor based over current / short circuit and earth fault microprocessor releases				-
	2 Nos.				-
B	Section 2				-
1.2	Incoming from DG supply				-
A.	320Amps 4pole MCCB (25KA) with built in microprocessor based over current / short circuit and earth fault microprocessor releases with 320 Amps 4pole Contractor phase indicating & auto manual switch etc with following accessories.				-
	1 Set				-
i.	Multifunctional meter (conserve – EM 6400 or equivalent) of accuracy class-I, with 3 Nos. 320/5 amps 15VA CTs to measure and display the following electrical quantities:				-
a.	Total active energy (KWH/MWH)				-
b.	Maximum demand (KVA/MVA) (KW/MW)				-
c.	Current				-
d.	Instantaneous power factor				-
e.	Voltage				-
f.	Frequency				-
	1 Set				-
ii.	Phase indicating light through 415/ $\sqrt{3}$: 110V/ $\sqrt{3}$ PT, Primary/ Secondary of PT's shall be protected by 2 amps MCB's.				-
	1 Set				-
iii.	Contractor ON / OFF / TRIP indicating lights with control MCB's and fuse.				-
	1 Set				-
iv.	Earth Fault Relay				-
	1 Set				-
v.	24 V DC Shunt trip coil.				-



		1 Set				-
vi.	Auto-manual / test selector / switch					-
		1 Set				-
vii.	Auxiliary contacts required for necessary interlocking of breakers.					-
		1 Set				-
B.	Bus Bars					-
	800 amps TPN (25 KA) aluminium bus bars with coloured heat shrinkable insulated sleeve.					-
		1 Set				-
C.	Outgoing					-
						-
i.	63 amps TPN MCB					-
		6 Nos.				-
ii	63 amps DP MCB					-
		2 Nos.				-
	MDB MAIN PANEL described as above	Set	1			-
						-
2	SDB UPS PANEL (WALL MOUNTED TYPE) LOC.-STILT FLOOR					-
	Incoming: (Main)-1 From MAIN PANEL (METER BOARD)- EB SUPPLY					-
A	63Amps 2pole MCB					-
		1 Set				-
B	Bus Bars: (Main)					-
	100amps DP (20KA) aluminium bus bars with coloured heat shrinkable insulated sleeve.					-
		1 Set				-
C	Outgoing:					-
i	32 amps DP MCB					-
		4 Nos.				-
ii	25 amps DP MCB					-
		3 Nos.				-
	SDB COMMON SERVICES (WALL MOUNTED TYPE) described as above	Set	1			-
						-
3	HVAC PANEL -1 O/D TYPE- IP 65 FOR GR & 1ST FLOOR HVAC O/D					-
	Incoming: (Main)					-
a	320Amps 4pole MCCB with built in microprocessor based over current / short circuit and earth fault microprocessor releases etc with following accessories.					-
		1 Set				-
i.	Multifunction digital electronic meter and 320/5 Amps 15 VA, CL 1 CTs .					-
		1 Set				-
ii	Phase indicating light shall be protected by 2 amps SP MCB's.					-
		1 Set				-
b	Bus Bars: (Main)					-
	400 amps TPN (25 KA) aluminium bus bars with coloured heat shrinkable insulated sleeve.					-
		1 Set				-
c	Outgoing:					-
i.	32 amps TPN MCB					-
		39 Nos.				-
	HVAC PANEL -1 O/D TYPE- IP 65 FOR GR & 1ST FLOOR HVAC O/D described as above	Set	1			-
						-
	TOTAL OF LT PANELS					-
						-
I.	SUPPLY & INSTALLATION OF UPS SYSTEM					-
	Online UPS - Input supply: Single Phase, Output Supply: Single Phase.					-



1	Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) ON LINE Uninterrupted Power Supply (UPS) system suitable for Single Phase input, Single Phase output AC Supply. The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch along with provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. The UPS systems shall be Microprocessor based Digital Control, using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter with PWM (Pulse Width Modulation) Technology. The quality of design, manufacturing and inspection process should confirm to the relevant Inter-national standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >95% at 100% non-linear loads. Current <u>total harmonic distortion (THD), total demand distortion</u> (The required LC filters shall be included in UPS cost), extreme power factor kit to be include to limit the input pf to 0.99 and output power factor shall be unity (i.e. kw rating of the UPS shall be kva rating x 1) however UPS shall be suitable to take load at 0.7 lagging to 0.7 leading power factor loads. UPS shall be suitable for incoming supply AC single phase 160-270V 50 Hz and delivering output AC supply true sine wave single phase 220/230/240 Volt, 50 Hz +/- 0.2Hz, Overload capacity of 120% for 10 mins and 150% for 1minute. Operating temperature 0 to 40 0C, Relative humidity 0-95% non condensing, noise level less than 60db at 1 meter distance, Protection for Under voltage, over voltage, abnormal output voltage, battery over charging, output <u>over current, short circuit, battery deep discharge</u> . 10 KV UPS shall comply with low voltage electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI) type UPS (as per standard IEC 62040-1, 2 & 3) . The UPS should be with IGBT Based Inverter Technology, Communication RS232/ RS485/ SNMP port open protocol for BMS integration as per approved by Engineering in charge. Required battery racks, DC breaker of suitable rating and interconnecting copper conductor cable of suitable size and connectors and all required accessories are inclusive in the cost. The UPS should have QR code which should contain drawing, test					
	1.1	12.5KVA	Each	1		-
TOTAL OF UPS SYSTEM						-
J. CONDUITING WIRING AND CABLING FOR VOICE / DATA SYSTEM						
A VOICE / DATA SYSTEM						
1	Supplying and drawing following pair 0.5 mm dia FRLS/HFFR PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.					-
1.1	4 Pair	Metre	50			-
						-
2	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.					-
2.1	25 mm	Meter	45			-
						-
3	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.					-
3.1	Telephone socket outlet	Each	1			-
						-
4	Supplying and drawing 10 Pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC Conduit etc. complete as required.	Metre	50			-
						-
5	Supply, fixing, cable termination, testing and commissioning of krone type Tag Blocks and boxes with lockable door etc. as required.					-
5.1	10 pair tag box	Each	1			-
						-



6	Supplying, Installation, Testing and commissioning of following CAT6 Patch Cord should have ETL/UL verification program certificate for compliance with ANSI/TIA-568.2-D etc. complete as required.				-
6.1	Copper Patch Cords of length 1m (3ft)	Each	100		-
6.2	Copper Patch Cords of length 3m (10ft)	Each	22		-
					-
7	Supplying, Installation, Testing and commissioning of CAT6 Copper Information Outlet (IO) with face plate of color as per site requirement, should have ETL/UL verification program certificate for compliance with ANSI/TIA-568.2-D. All copper Cable and Components should be from same OEM to maintain compatibility and interoperability etc. complete as required.	Each	122		-
					-
8	Supplying, Installation, Testing and commissioning of RJ45 Connector for CAT 6/6A Cables. RJ45 modular plug supports 4 twisted pairs, 8 positions, 8 connectors. Housing: PC, UL94V-2, transparent color, Use for 24- 26 AWG stranded wires etc. complete as required.	Each	123		-
					-
9	Supplying, drawing, Installation, Testing and commissioning of CAT6 UTP LSZH 23AWG Twisted Pair Cable in existing conduit/ on surface, Category 6 Unshielded Twisted Pair, 4 pair should be complied as per UL/ETL verification program for compliance with ANSI/TIA-568.2-D standard. Outer diameter should be in the range of 6.1mm nominal with Operating Temperature Range : -5° to +60°C, Bending Radius : < 4 X Cable Diameter at -5°C ± 1°C and Pulling Force : 11.5Kg etc. complete as required.				-
9.1	1 Run of cable	Meter	1250		-
					-
10	Supplying, installation, Testing and commissioning of following capacity 24 port Layer 2 indoor Network Switch having features and specifications etc. as mentioned here under: At least 24 X RJ-45 Gigabit Ethernet Ports and additional 2 X 10G Base -T with 4 X SFP Ports with non-blocking architecture by having Switching capacity of min. 168Gbps and packet forwarding rate of 125Mpps or higher, 16K MAC table. Console Port, USB port, Stacking support of min. 8 units per stack. Internal dual AC Power supply, STP, RSTP, MSTP, BPDU Filter, BPDU Restriction, Min. 9K Jumbo Frame, LBD, IGMP Snooping V1/V2/V3, MLD Snooping V1/V2. IGMP /MLD Groups 1K or more, IPv4/IPv6 Loopback Interface, 16 L3 IP Interface, Ipv6 ND, VRRPv3, UDP Helper, ECMP. VLAN: 802.1Q, Port based, Q-in-Q, Multicast VLAN, Protocol VLAN, VLAN Trunking, DHCP Snooping, Server, server Screening. RADIUS , TACACS+ Authentication, QoS: 802.1P, 8 queues per port, QoS : WRR, Strict+WRR, WRED, 802.1p. ACL: MAC based, IPv4C IPv6, TCP/UDP Port number, time based ACL, TFTP Client, SNMP V1, v2c, v3, SNMP traps, RMON, DHCP server, relay, client, LLDP, LLDP-MED, OAM, Dying Gasp, 802.3ah, sflow, RIP, OSPF v2/v3, policy based route, SSL, SSH. 6 kV surge protection on all Gigabit Ethernet ports and on all GE RJ-45 access ports. Certifications: UL, CE, FCC,				-
10.1	24 port Layer 2 Non-PoE Network Switch	Each	6		-
					-
11	Supplying and fixing of following size Wall Mount Rack having Fixed Structure with 0.8mm CRCA Sheet, completely knocked-down condition (CKD) Shape, Vertical Mounting Rail 1.6 mm with 'U'Marking, Minimum 2 cable entry/exit provision at Top and bottom with rubber protection, Front 5mm Toughened Glass with lock, wall mounting kit, Powder coated Color- RAL- 7035, complied with UL & RoHS, 2 x 6 sockets 16A power distribution units, 3 numbers closed cable organizer, Hardware mounting screws packet of 20 x 1number, etc. complete as required.				-
11.1	15U Rack	Each	1		-
					-
B	PERFORATED TRAYS				-
12	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				-
12.1	100 mm width X 50 mm depth X 1.6 mm thickness	Meter	50		-
12.2	150 mm width X 50 mm depth X 1.6 mm thickness	Meter	175		-



12.3	300 mm width X 50 mm depth X 1.6 mm thickness	Meter	40		-
					-
13	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "bends" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				-
13.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each			-
13.2	150 mm width X 50 mm depth X 1.6 mm thickness	Each	1		-
13.3	300 mm width X 50 mm depth X 1.6 mm thickness	Each	3		-
					-
14	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Tee" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				-
14.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each			-
14.2	150 mm width X 50 mm depth X 1.6 mm thickness	Each	2		-
14.3	300 mm width X 50 mm depth X 1.6 mm thickness	Each			-
					-
16	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc. direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required.				-
16.1	90 mm dia (OD-90 mm & ID-76 mm nominal)	Meter	1		-
					-
TOTAL OF FOR VOICE / DATA SYSTEM					
					-
K.	CONDUITING WIRING AND CABLING FOR CCTV SYSTEM				
1	Supplying, drawing, Installation, Testing and commissioning of CAT6 UTP LSZH 23AWG Twisted Pair Cable in existing conduit/ on surface, Category 6 Unshielded Twisted Pair, 4 pair should be complied as per UL/ETL verification program for compliance with ANSI/TIA-568.2-D standard. Outer diameter should be in the range of 6.1mm nominal with Operating Temperature Range : -5° to +60°C, Bending Radius : < 4 X Cable Diameter at -5°C ± 1°C and Pulling Force : 11.5Kg etc. complete as required.				-
1.1	1 Run of cable	Meter	2300		-
					-
2	Supplying and drawing following core Multi mode Fiber Optic Cable having corrugated steel armoring, lesser optimize 50/125 µm with HDPE jacket, LSZH (Low smoke Zero Halogen), Tight-buffered or loose tube, maximum attenuation: < 3.5 dB/km at 850 nm, <1.5 dB/km at 1300 nm, bandwidth > 2000 MHz-km at 850 nm, > 500 MHz-km at 1300 nm compliance and certifications: ISO/IEC 11801 Ed. 2.2, ANSI/TIA-568- C.3, ITU-T G.651.1 RoHS compliant. Multi Mode Fiber shall be Central-loose tube filled with Thixotropic jelly, duly following Standards: ISO 11801, IEC 60793- 1/60794-1-2, ITU-T-REC G.652D and Telecordia GR- 20-core, High quality Electro Chromium Coated Corrugated Steel tape (ECCS) and HDPE-Sheath, Operating ambient Temperature should be – 5 0C to +50 0C and Storage Temperature should be – 5 0C to +50 0C, Maximum Attenuation ± 3.5 dB/km at Operational Wavelength 850 nm and ± 1.5 dB / km at Operational Wavelength 1300 nm . type of fiber should be 50/125 / G.652D & Refractive Index should be 1.483/1.478, The value for Mode-filed,Cladding Diameter 50 ± 2.5 µm and 125 ± 1µm correspondingly i/c splicing & marking etc complete as required.				-
2.1	6 Core Multi Mode Optical Fiber Cable	Meter	200		-
					-
3	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.				-
3.1	25 mm	Meter	750		-
					-



4	<p>Supplying Installation Testing and Commissioning of 5/6MP IP IR Dome Camera having following specifications and features etc :- 1)Type of Camera: Dome Camera 2) Image Sensor: 1/2.8" or better progressive Scan CMOS get color image even at night condition 3) Signal System: PAL/NTSC 4) Minimum Illumination: 0.008Lux@ F1.4, AGC ON, 0 lux with IR or better 5) Imaging: 1/3s to 1/30000s Shutter Support, Auto Gain Control , White Balance- Auto, Back Light Compensation, Multi zone Privacy Masking, HLC, Digital Watermarking. 6) On Screen Display: Camera should display Camera title, Date & Time in live & recorded video both. 7) Signal to Noise Ratio: > 50 dB 8) Day & Night: True Day & Night High Performance Mechanical IR cut filter with auto switch, IR Source- Inbuilt IR LED's with effective distance upto 50 Mtrs integrated IR 30 Mtrs for colour view in night. 9) Video Compression (Minimum): H.265 or better, Audio:- G.711U/A, G.711Mu, G.726, AAC, G.723 10) Wide Dynamic Range: WDR (120dB or more) 11) Digital Noise Reduction: DNR (2D/3D) On/Off 12) Streaming: Triple streaming, configurable 13) Video Streaming & Frame Rates: Triple streaming , configurable Main stream: 5/6MP @25/30 fps, Sub streams: D1@25/30 fps or better 14) Image Setting: Rotate Mode, saturation, brightness, contrast, sharpness adjustable through client software or web browser 15) Profile Management: User configuration import, export 16) Security: User Authentication, Water Marking 17) Onboard Storage: Camera should support built-in Micro SD/SDHC/SDXC Card slot upto 512 GB. It should be supplied with minimum 128GB memory Card. 18) Recording Management: Format SD overwrite storage</p>				
	<p>19) Edge Analytics : Tripwire, Intrusion, Motion Detection 20) Alarm Trigger : Motion/tampering detection; network disconnection detection; IP conflict detection; memory card state detection; memory space detection 21) Alarm Support: It should have 1/1 Alarm In/ Out Port 22) Audio Support: It should have 1x Built-In Mic and 1/1 Audio In/ Out Port for external Mic. and Speaker (As per site requirement) with G.711U/A/ G.711Mu/ AAC/ G.726 audio compression 23) Network Protocol: SFTP, IPv6, IPv4, DNS,RTCP, NTP, RTP, HTTP, HTTPS, SNMP TCP/IP, PPPoE, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, unicast, 24) System Capability: ONVIF 25) VMS: Camera shall support open source VMS 26) Cyber Security: trusted boot, AES 256-bit Encryption, Configuration encryption, trusted execution, Digest, security logs, , account lockout, video encryption, IP/MAC filtering, HTTPS, trusted upgrade. 27) Ethernet: 1 RJ 45 10/100 Ethernet port 28) Power Input: The camera should support simultaneous dual power input—12 VDC (via power adapter) and PoE—to ensure continuous operation in the event of a failure in one power source. 29) Power Requirement: 12VDC/24VDC/PoE (802.3af/ePoE 30) Enclosure: IP67 weather proof, IK10 31) Operating Condition: Ambient Temperature:- (-) 05°C to 50°C, humidity 95% (max) (non-condensing) 32) IR life: 40000 hours or higher 33) Video Bit rate: 32 KBPS - 8 MBPS or better 34) Standards: BIS with ER, STQC Certified, CE, FCC and RoHS</p>				
4.1	5MP/6MP IP IR 2.8/ 3.6/6/8/12 mm fixed lens (as per site requirement) Dome Camera.	Each	60		-
					-



5	<p>Supplying Installation Testing and Commissioning of 5MP/6 MP IP IR Bullet Camera having following specifications, type of lens and features etc :- 1) Type of Camera: Bullet Camera 2) Image Sensor: 1/2.8" or better progressive Scan CMOS get color image even at night condition 3) Signal System: PAL/NTSC 4) Minimum Illumination: 0.006Lux@ F1.4, AGC ON, 0 lux with IR or better 5) Imaging: 1/3s to 1/30000s, Auto Gain Control , White Balance- Auto, Back Light Compensation, Multi zone Privacy Masking, HLC, Digital Watermarking. 6) On Screen Display: Camera should display Camera title, Date & Time in live & recorded video both. 7) Signal to Noise Ratio: > 50 dB 8) Lens Type & Focus: as given below. 9) Day & Night: True Day & Night High Performance Mechanical IR cut filter with auto switch, IR Source- Inbuilt IR LED's with effective distance upto 50 Mtrs integrated IR and 30 Mtrs for colour view in night. 10) Video Compression (Minimum): H.265 or better, Audio:- G.711U/A, G.711Mu, G.726, AAC, G.723 11) Wide Dynamic Range: WDR (120dB or more) 12) Digital Noise Reduction: DNR (2D/3D) On/Off 13) Streaming: Triple streaming, configurable 14) Video Streaming & Frame Rates: Triple streaming , configurable Main stream: 5MP/6MP @25/30 fps, Sub streams: D1@25/30 fps or better 15) Image Setting: Rotate Mode, saturation, brightness, contrast, sharpness adjustable through client software or web browser 16) Profile Management: User configuration import, export 17) Security: User Authentication, Digital Water Marking 18) Onboard Storage: Camera should support built-in Micro SD/SDHC/SDXC Card slot upto 512 GB. It should be supplied with minimum 128GB memory Card. 19)</p>				
	<p>20) Edge Analytics: Tripwire, Intrusion, Motion Detection 21) Alarm Trigger : Motion/tampering detection; network disconnection detection; IP conflict detection; memory card state detection; memory space detection 22) Alarm Support: It should have 1/1 Alarm In/ Out Port 23) Audio Support: It should have 1x Built-In Mic and 1/1 Audio In/ Out Port for external Mic. and Speaker (As per site requirement) with G.711U/A / G.711Mu/ AAC/ G.726 audio compression 24) Network Protocol: SFTP, IPv6, IPv4, DNS,RTCP, NTP, RTP, HTTP, HTTPS, SNMP TCP/IP, PPPoE, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, unicast, 25) System Capability: ONVIF 26) VMS: Camera shall support open source VMS 27) Cyber Security: trusted boot, AES 256-bit Encryption, Configuration encryption, trusted execution, Digest, security logs, account lockout, video encryption, IP/MAC filtering, HTTPS, trusted upgrade. 28) Ethernet: 1 RJ 45 10/100 Ethernet port 29) Power Input: The camera should support simultaneous dual power input—12 VDC (via power adapter) and PoE—to ensure continuous operation in the event of a failure in one power source. 30) Power Requirement: 12VDC/24V DC/PoE (802.3af)/ePoE 31) Enclosure: IP67 weather proof, IK10 32) Operating Condition: Ambient Temperature:- (-)05°C to 50°C, humidity 95% (max) (non-condensing) 33) IR life: 40000 hours or higher 34) Video Bit rate: 32 KBPS - 8 MBPS or better 35) Standards: BIS with ER, STQC Certified, CE, FCC and RoHS</p>				
5.1	5MP/6MP IP IR 2.8/ 3.6/6/8/12 mm fixed lens (as per site requirement) outdoor bullet Camera .	Each	4		-
					-



6	Supplying, installation, Testing and commissioning of following capacity 24 port Layer 2 indoor Network Switch having features and specifications etc. as mentioned here under: At least 24 X RJ-45 Gigabit Ethernet Ports and additional 2 X 10G Base -T with 4 X SFP Ports with non-blocking architecture by having Switching capacity of min. 168Gbps and packet forwarding rate of 125Mpps or higher, 16K MAC table. Console Port, USB port, Stacking support of min. 8 units per stack. Internal dual AC Power supply, STP, RSTP, MSTP, BPDU Filter, BPDU Restriction, Min. 9K Jumbo Frame, LBD, IGMP Snooping V1/V2/V3, MLD Snooping V1/V2. IGMP /MLD Groups 1K or more, IPv4/IPv6 Loopback Interface, 16 L3 IP Interface, Ipv6 ND, VRRPv3, UDP Helper, ECMP. VLAN: 802.1Q, Port based, Q-in-Q, Multicast VLAN, Protocol VLAN, VLAN Trunking, DHCP Snooping, Server, server Screening, RADIUS , TACACS+ Authentication, QoS: 802.1P, 8 queues per port, QoS : WRR, Strict+WRR, WRED, 802.1p. ACL: MAC based, IPv4C IPv6, TCP/UDP Port number, time based ACL, TFTP Client, SNMP V1, v2c, v3, SNMP traps, RMON, DHCP server, relay, client, LLDP, LLDP-MED, OAM, Dying Gasp, 802.3ah, sflow, RIP, OSPF v2/v3, policy based route, SSL, SSH. 6 kV surge protection on all Gigabit Ethernet ports and on all GE RJ-45 access ports. Certifications: UL, CE, FCC, RoHS, MTCTE, OEM/Product must be on Trusted Telecom Portal of Department of Telecommunication, Government of India etc. complete as required.					-
6.1	24 port Layer 2 Non-PoE Network Switch	Each	3			-
						-
7	Supplying and fixing of following size Wall Mount Rack having Fixed Structure with 0.8mm CRCA Sheet, completely knocked-down condition (CKD) Shape, Vertical Mounting Rail 1.6 mm with 'U'Marking, Minimum 2 cable entry/exit provision at Top and bottom with rubber protection, Front 5mm Toughened Glass with lock, wall mounting kit, Powder coated Color- RAL- 7035, complied with UL & RoHS, 2 x 6 sockets 16A power distribution units, 3 numbers closed cable organizer, Hardware mounting screws packet of 20 x 1number, etc. complete as required.					-
7.1	6U Rack	Each	2			-
7.2	2U Rack	Each				-
						-
	Network Video Recorder (NVR) Supplying Installation Testing and Commissioning of following Channel Network Video Recorder (NVR) with camera licenses to record for all channels having specifications and features etc as mentioned below :1) Network Video Recorder Embedded/ Installed OS (Linux) along with Camera Licenses for number of channels of NVR to record per NVR and to provide a live view, storage and simultaneously Multi-channel playback of all IP, IR camera or more and must be ONVIF with minimum support of 256Mbps incoming Bandwidth.					-
	2) NVR should support H.265 or better, H.264, MJPEG, MPEG4 support 3) Must support 1 channel Input, 1 channel Output, RCA for Two-way Talk 4) Intelligent auto power on when power resumes after power outage. 5) Storage: It should support minimum 2 SATA Slots with 20TB capacity/ Slot. 6) Connectivity Interface : 1 Nos. x 10/100/1000 Mbps Ethernet Ports, 1x RS485, 1x RS2327) Backup Interface : Its should have 2 Nosx USB port (1x USB3.0, 1xUSB2.0) 8) Video Output Ports: 1x HDMI and 1 VGA 9) Alarm Ports: It should have 4/1 Ch In/ Out ports to connect various type of external sensors and output devices like hooter/ Siren etc. 10) Email & SMS Alert options: Option for SMS/ Email Alerts to minimum 5 designated mobile number for power failure, HDD failure, vandalism, tampering, network disconnection and panic 11) Web & Mobile Application: Web, Mobile app (For iPhone, iPad, Android Phone) for alerts and viewing. 12) Protocols: HTTP, HTTPS, TCP/IP, IPv4, UDP, NTP, DHCP, DNS, SMTP, UPnP, DDNS, Alarm Server, IP Search, Multicast, Auto Registration, ONVIF (Profile T, Profile S, Profile G), CGI, SDK and OEM Cloud for remote monitoring without any public IP need.					-



	<p>13) Standards: CE, FCC, RoHS and BIS Certified 14) Power Supply : Should support 12VDC, 4Amp or AC100-240V, 50/60Hz Power supply. 15) Operating Condition : Ambient Temperature (-5°C to 50°C), humidity 90% (max) (non-condensing) 16) The VMS, NVR application shall support all the features & functionalities of the offered cameras. 17) VMS should consist of Base license and Channel Licenses. VMS should be provided with camera Licenses , with no dependency of VMS licenses by binding with the MAC address of the cameras to achieve the functionality. 18) The NVR OEM shall be responsible for providing a mobile application compatible with both Android and iOS devices, enabling remote monitoring and playback of cameras/NVR footage.</p>				
8.00	<p>19) The OEM must provide its own DDNS server hosted in India, eliminating the need for a public IP address for remote monitoring over the Internet. 20) Must support Resolution: 7680x4320 (8K), 3840*2160, 1920x1080, 1280x1024,1280x720, 1024x768 21) Must support recording resolution upto 32MP 22) Must support Continuous, Alarm, Motion, Instant, Panic Recording Mode 23) When alarm recording is enabled and an event occurs, you can click the alarm icon on monitoring page to view the alert details. The snapshot function is supported on monitoring and playback page 24) The Network Video Recorder (NVR) shall be configured to send email whenever a system message is created or an alarm event occurs. The email servershall be a valid SMTP server. Each recipient email address shall be configured to receive any combination of critical, warning, or informational messages or alarm notifications. When an alarm occurs, the email message includes the NVR name, time of alarm and a list of camera that is configured to record upon alarm 25) It should support Network Support: HTTP, TCP/IP, SMTP, DHCP, DNS, DDNS, FTP, NTP, UPnP, Multi IP Setting. Convert multiple recording files to one avi/MP4 file.</p>				
	<p>26) General AI Based Search: Search Pictures by channel, time, event type, target classification (Fall Detection, People Approach Detection, People No. Exception Detection, People Staying Detection, Violence Detection. 27) Alarm Notifications based on: Motion detection, video tampering, video loss, scene changing, PIR alarm, Camera external alarm, Face detection, face recognition, perimeter protection (intrusion and tripwire), ANPR, people counting, stereo analysis, crowd distribution, heat map, Disk Full, Storage Error, IP Conflict and abnormal behavior of fan 28) Alarm Notification should be linked with Recording, snapshots, Camera external alarm output, buzzer, logs, presets and email.</p>				
	<p>AI :- 2 Channel face detection and recognition, - Minimum 4 Channel perimeter protection, - Minimum 8 Channel Smart Motion Detection 30) Face Recognition Database Capacity: It should support total Blacklist and Whitelist capacity of Minimum 20,000 Faces or more with Face Detection speed of 12 face images/sec. 31) Face & Human Attributes Search: Search Pictures/ Video by Gender, age group, glasses, expressions, face mask, beard, Top color, top type, hat, bag, age, gender and umbrella. 32) ANPR Capability: It should support ANPR Camera with License plate, plate color, vehicle body, vehicle model, vehicle logo, calling, seatbelt, vehicle registration location etc vehicle attributes. 33) Alarm Notifications based on: Motion detection, video tampering, video loss, scene changing, PIR alarm, Camera external alarm, Face detection, face recognition, perimeter protection (intrusion and tripwire), ANPR, people counting, stereo analysis, crowd distribution, heat map, Disk Full, Storage Error, IP Conflict and abnormal behavior of fan, cybersecurity exception 34) Alarm Notification should be linked with Recording, snapshots, Camera external alarm output, buzzer, logs, presets and email. 35) General AI Based Search: Search Pictures by channel, time, event type, target classification (Fall Detection, People Approach Detection, People No. Exception Detection, People Staying Detection, Violence Detection. 36) Smart playback function: Should support smart search for the selected area in the video and smart playback to improve the playback efficiency 37) VCA (Video Content Analytic): Should support multiple video contented analytics based on camera analytics</p>				



8.1	16 Channel Network Video Recorder (NVR) having display split :- Main screen: 1/4/8/9/16, 2nd screen:	Each	5		-
					-
9.0	Supplying, Installation, Testing and Commissioning following capacity Surveillance grade Hard Disk with upto 256MB/s Transfer Rate, 256 MB Cache, 7200 RPM Disk Speed, 3.5 inch form factor, SATA Interface, BSMI, ICES-003/NNB-003, CE, FCC, KC, Maghreb, RCM, UKCA, VCCI, CB-Scheme, TUV, UL Certifications.				-
9.1	8TB (Terabytes)	Each	6		-
10.0	SITC of ceiling mounted POE Wifi Booster	Nos	4		-
					-
	TOTAL FOR CCTV SYSTEM				-
L.	FIRE DETECTION AND ALARM SYSTEM (CONVENTIONAL)				
1	FIRE DETECTION AND ALARM SYSTEM (CONVENTIONAL)				-
					-
1.1	Supplying, installation, testing & commissioning of heat detector operating at 54°C/57°C with rate of rise cum fixed temperature (dual thermistor) type with mounting base	Each			-
					-
1.2	Supplying, installation, testing & commissioning of smoke detector with builtin LED and mounting base complete with all connections etc. as required.	Each	80		-
					-
1.3	Supplying, installation, testing & commissioning of manual call box of ABS type in surface/recess with stainless steel chain & hammer assembly complete with glass and push button etc. as required.	Each	4		-
					-
1.4	Supplying, installation, testing & commissioning response indicator on surface/recess MS box having two LEDs metallic cover complete with all connections etc. as required.	Each			-
					-
1.5	Supplying, installation, testing & commissioning fire alarm sounder with facility to make announcement, mounted in A.B.S. box with hinged cover plate & suitable for operation with amplifier i/c line matching transformer etc. complete as required.	Each	4		-
					-
1.6	Supplying, installation, testing & commissioning talk back slave station in surface/recess suitable for operation on simplex mode complete with P.T.T. knob & speaker/microphone enclosed in a M.S.(16 SWG) ABS box with break glass in front etc. complete as required.	Each	2		-
					-
1.7	Supplying, installation, testing & commissioning of main control and indicating panel made out of 16 SWG MS sheet to accommodate the following items duly powder coated in approved colour with louvers for ventilation, locking arrangement, audio and visual indication for fire alarm and public address system, monitoring system including connections, interconnections etc complete as required. 6 zone panel for fire alarm system 100 watt amplifier racks suitable for operation on 230V AC/24V DC supply conforming to IEC-268-3 complete with all accessories as required- 2 Nos.(one to act as standby) Talk back master station with LED PTT (press to talk) push button for operation on 230V AC/24 V DC supply conforming to IEC-268 for simplex mode of operation/communication suitable for 20 Nos. talk back unit -1 set. Announcement control desk suitable for selection of different zones selectively and ON ALL CALL switch with visual indication etc., complete as required- 1 set. Amplifier change over switch for inter changing amplifier- 1 No. Monitor panel for loudspeaker complete output selector ON/OFF switch, fuse visual indications etc. complete as required- 1 No. Gooseneck microphone with stand and ON/OFF switch -1 No. Mains ON/OFF switch, fuse indication lamps, DC and AC voltmeters & ammeters terminal blocks etc. complete as	Each	1		-
					-
1.80	28.5 CABLING & WIRING				-
					-



1.8.1	Supplying & laying of 2x1.5 sqmm fire alarm armoured cable, 600/1000V rated with annealed copper conductor having XLPE insulation, steel wire armouring & FRLS/HFFR outer sheath complete as required.	Meter	3200		-
					-
2	PUBLIC ADDRESS SYSTEM				-
					-
2.1	Supplying, installation, testing & commissioning of 6 zone, voice alarm controller with USB, MP4 player (including 6 zone button paging station) with seamless integration facility with main fire alarm panel for voice evacuation complete as required.	Each	1		-
					-
2.2	Supplying, installation, testing & commissioning of 1.5/3/6W ceiling speaker complete as required.	Each	45		-
					-
2.3	Supplying, installation, testing & commissioning of digital audio amplifier 50 Watt, 25V rms operating at 240 volt AC supply complete as required.	Each	1		-
					-
2.4	Supplying, installation, testing & commissioning of Voice command keypad 6 zone, with microphone assembly complete as required.	Each	1		-
					-
2.5	CABLING & WIRING				-
					-
2.5.1	Supplying and drawing of cable Fire Retardant PVC insulated copper conductor cable in the existing surface / recessed steel conduit of following pairs, cores and size including connections and interconnections etc. as required.				-
2.5.1.1	speaker cable Single pair, 2-core, 1.5 sqmm	Meter	1300		-
2.5.1.2	speaker cable Two pair, 2-core, 1.5 sqmm	Meter			-
					-
2.6	Supplying and fixing 25 mm dia MS flexible pipe with PVC coating along with all ancillaries and accessories like coupler etc. as required.	Meter	50		-
					-
2.7	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.				-
2.7.1	25 mm	Meter	450		-
					-
	TOTAL FOR FOR FIRE ALARM & PA SYSTEM				-



SUMMARY OF COST FOR FURNITURE WORKS

S.No	DESCRIPTION	UNIT	Qty	RATE (in Rs)	AMOUNT (RS)
J	FURNITURE WORKS				-
	TOTAL OF CIVIL & INTERIOR WORKS				-
S.No	DESCRIPTION	UNIT	Qty	RATE (in Rs)	AMOUNT (in Rs)
A	DISMANTLING AND DEMOLISHING				
J	FURNITURE WORKS				
	STAFF CUBICAL Size- 1200Wx600Dx750Hmm 25mm Pre Lam Particle Board (Action Tesa) Electrical Provision- Wire Manager hole and Wire Snakes& Cable Trey Under Structure -Metal Sharp leg Modesty - 18mm thick Laminate Modesty (450Hmm)	Nos.	22.00		-
1					
2	2 SEATER SOFA Supplying and Placing in place of 2 seater sofa. The overall dimensions of the sofa shall be 1460W x 905D x 855H. The seat should be made of PU foam with Density 28 ± 2 kg/cu.mtr having an additional top layer of supersoft PU foam with Density 32 ± 2 kg/cu. Seat should be upholstered with fabric or leatherette. 2) BACK FOAM: The back should be made of PU foam with Density 28 ± 2 kg/cu. mtr with two additional top layer of supersoft foam of density 32±2 kg/cu. mtr, upholstered with fabric or leatherette. Understructure should be made up of 1.2±0.1 cm. thick hot pressed plywood (which also shall be resistance and termite proof as per IS:303.) and pinewood of cross section devoid of major knots and surface defects 6 nos. per seat and 3.8mm dia. zigzag spring assembly is mounted over understructure for cushioning effect. It should be a welded assembly made in Stainless steel (grade SS 202) tube & plate with plastic endcap.	Nos.	3.00		-
3	CENTRE TABLE Glass shall be 10±/0.3mm thick black tinted toughened glass UV glued with bushes made in SS 202 grade for fixing with understructure. It shall be a welded assembly made in SS202 grade having dia. 12±/0.04 as per IS:1762. overall dimensions of table shall be Width of table= 112.0 cm, Depth=60.0 cm, height=35.1 cm.	Nos.	1.00		-
4	VISITOR/MEETING CHAIR The cushioned seat and back assembly consists of seat base moulded in glass filled Poly-amide, moulded polyurethane foam and upholstered with high stretch knitted polyester fabric. The back size shall be 45.5cm W x 53.0cm H. The HR polyurethane foam used in seat and back cushion is moulded in density 45kg per m3. The seat and back are firmly connected to the base frame and are cantilevered in such a way that it gives a multi dimensional movement possibility just with a simple lean on the sides or back, without need for complex manual adjustments. The cantilevered seat offers impact cushioning while seating and synchronises with the back movement during posture changes. The 'S' shaped spines moulded in high strength glass filled Polyamide and the spine connector moulded in glass filled Polyamide form the back spine structure involved in multi dimensional recline motion. The variable tilt angle recline motion can be adjusted with 3 position Tilt limiter feature which is inbuilt in seat base and the tension is user weight dependent. The adjustable armrests assembly consists of armrest housing sliding over the armrest structure, both moulded in glass filled Polyamide. The pneumatic height adjustment shall have a stroke of 9.2cm. The pedestal is injection moulded in glass filled Polyamide and fitted with 5 nos. twin wheel castors. The pedestal is 66cm pitch centre diameter and 76cm with castors. The overall dimensions of the chair shall be 76cmx 76cm x(99.5-108.8cm). The seat height shall be (44.5-53.8cm).	Nos.	23.00		-
5	FACULTY CHAIR The cushioned seat and back assembly consists of seat base moulded in glass filled Poly-amide, moulded polyurethane foam and upholstered with high stretch knitted polyester fabric. The back size shall be 45.5cm W x 53.0cm H. The HR polyurethane foam used in seat and back cushion is moulded in density 45kg per m3. The seat and back are firmly connected to the base frame and are cantilevered in such a way that it gives a multi dimensional movement possibility just with a simple lean on the sides or back, without need for complex manual adjustments. The cantilevered seat offers impact cushioning while seating and synchronises with the back movement during posture changes. The 'S' shaped spines moulded in high strength glass filled Polyamide and the spine connector moulded in glass filled Polyamide form the back spine structure involved in multi dimensional recline motion. The variable tilt angle recline motion can be adjusted with 3 position Tilt limiter feature which is inbuilt in seat base and the tension is user weight dependent. The adjustable armrests assembly consists of armrest housing sliding over the armrest structure, both moulded in glass filled Polyamide. The pneumatic height adjustment shall have a stroke of 9.2cm. The pedestal is injection moulded in glass filled Polyamide and fitted with 5 nos. twin wheel castors. The pedestal is 66cm pitch centre diameter and 76cm with castors. The overall dimensions of the chair shall be 76cmx 76cm x(99.5-108.8cm). The seat height shall be (44.5-53.8cm).	Nos.	18.00		-
6	LECTURE TABLE Providing in place of main table with overall size of table equal to 1200 x 600 x750mm. The table is made of 25 mm thick Prelaminated Twin Board of E1-P2 grade edge banded with matching 2mm thick PVC lipping. Grommet provided on work surface for wire management. The modesty panel is made of 25 mm thick Prelaminated Twin Board of E1-P2 grade. The understructure is made of 25 mm thick Pre-laminated twin board of E1-P2 grade and approved shade edge banded with matching 2 mm thick PVC lipping. The Hinge door unit is made of 25 mm thick Pre-laminated twin board of E1-P2 grade and approved shade edge banded with matching 2 mm thick PVC lipping. Handles are provided for ease of opening. Pedestals are provided with lock for security.	Nos.	18.00		-
7	CLASSROOM DESK 4 SEATER The system shall be a desk-based system with a platform understructure made up of a combination of MS. Tubes and plates. The terminating leg structure shall be in M.S. CRCA sheet/ tubes/rods finished with epoxy power coating of the approved colour as per the project designer. The terminating legs can be provided with modesty panels optionally. These modesty panel shall be of Metal 1.2 mm thick CRCA. The legs shall be provided with translucent glide screws to take care of the levelling as per the site requirements. Worktop shall be made of 25MM thick Pre-Laminated Board. All the edges of work surface shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. The worktop shall be complete with provisions for screen mounting as well as for wire management on the workstation. Provisions for fixing of the switches shall be on the wire tray/channel. Wire riser leg or independent wire risers shall be provided as per the layout structure. The overall size of the worktop shall be 1200mm x 350mmD. The overall size of the workstation shall be 1	Nos.	14.00		-
8	CLASSROOM DESK 3 SEATER The system shall be a desk-based system with a platform understructure made up of a combination of MS. Tubes and plates. The terminating leg structure shall be in M.S. CRCA sheet/ tubes/rods finished with epoxy power coating of the approved colour as per the project designer. The terminating legs can be provided with modesty panels optionally. These modesty panel shall be of Metal 1.2 mm thick CRCA. The legs shall be provided with translucent glide screws to take care of the levelling as per the site requirements. Worktop shall be made of 25MM thick Pre-Laminated Board. All the edges of work surface shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. The worktop shall be complete with provisions for screen mounting as well as for wire management on the workstation. Provisions for fixing of the switches shall be on the wire tray/channel. Wire riser leg or independent wire risers shall be provided as per the layout structure. The overall size of the worktop shall be 1200mm x 350mmD. The overall size of the workstation shall be 1	Nos.	384.00		-



9	<p>CLASSROOM DESK 2 SEATER The system shall be a desk-based system with a platform understructure made up of a combination of MS. Tubes and plates. The terminating leg structure shall be in M.S. CRCA sheet/ tubes/rods finished with epoxy power coating of the approved colour as per the project designer. The terminating legs can be provided with modesty panels optionally. These modesty panel shall be of Metal 1.2 mm thick CRCA. The legs shall be provided with translucent glide screws to take care of the levelling as per the site requirements. Worktop shall be made of 25MM thick Pre-Laminated Board. All the edges of work surface shall be provided with machine pressed 2 mm thick PVC flooring glued with hot melt EVA glue. The worktop shall be complete with provisions for screen mounting as well as for wire management on the workstation. Provisions for fixing of the switches shall be on the wire tray/channel. Wire riser leg or independent wire risers shall be provided as per the layout structure. The overall size of the worktop shall be 1200mm x 350mmD. The overall size of the workstation shall be 1</p>	Nos.	20.00		-
TOTAL OF FURNITURE WORK					
					-



LIST OF APPROVED MAKES

A. A PEB

S.No	Item Description	Approved Makes
1	Pre-Engineered Building (PEB) & LGSF Manufacturer / System	Interarch Building Products; Tata BlueScope;Kamdhenu PEB; VMSteelTech or Equivalent
2	PEB Structural Design Software / Engineering Capability	In-house design using STAAD / Tekla / MBS software or approved equivalent
3	Primary Structural Steel Members	TATA Steel; JSW Steel; SAIL; Jindal Steel or Equivalent
4	Secondary Members (Purlins / Girts)	TATA Steel; JSW Steel; SAIL; Jindal Steel or equivalent
5	Roofing Sheets / Standing Seam / Trapezoidal Profile	Tata BlueScope Durashine; JSW Colouron+; Jindal Roofing; Interarch Lifease or equivalent
6	Wall Cladding Sheets	Tata BlueScope; JSW; Jindal; Interarch, Everest or equivalent
7	Insulated Sandwich Panels	Kingspan; Metecno; Tata BlueScope; Multicolor or equivalent
8	Fasteners / Stitch Screws / Self Drilling Screws	Hilti; Fischer; TVS; Unbrako or equivalent
9	High Strength Structural Bolts	Unbrako; TVS Fasteners; LPS Bossard or equivalent
10	Sag Rods / Bracing Accessories	Approved by PEB manufacturer from structural steel complying with IS specifications
11	Sealants for PEB Envelope	Dow Corning; Sika; Fosroc; GE Silicones or equivalent
12	Insulation for Roof / Wall	UP Twiga; Owens Coming; Rockwool; Kimmco or equivalent
13	Gutters and Down Take Pipes	Jindal; Tata; approved fabricated by PEB manufacturer
14	PEB Flashings / Trims / Ridge Caps	Factory fabricated by approved PEB manufacturer
15	Roof Safety Lifeline / Walkway Systems	3M; Honeywell; Karam or equivalent



B. B CIVIL INTERIOR		
S.No	Item Description	Approved Makes
2	Cement	UltraTech; ACC; JK Cement; Birla; Ambuja; JSW or equivalent
3	Steel Reinforcement Bars	TATA Tiscon; SAIL; Jindal; JSW; Rathi or equivalent
4	Structural Steel Sections	TATA Steel; SAIL; Jindal; JSW or equivalent
5	Stone Aggregate (Blue / Black)	Sohna; Pali; approved quarry
6	Anti Termite Treatment	Bayer; BASF; FMC; approved IPCA member or equivalent
7	Waterproof Shuttering Ply	Century; Greenply; Duro; or equivalent
8	Teak Wood	1st Class Indian Teak
9	Flush Doors (ISI)	Merino; Shakti Met-Dor; Kitply; Duro; Greenply; Century or equivalent
10	Laminates	Merino; Greenlam; Century; Durian
11	Hardware	Hettich; Hafele; Dorma; Geze; Ozone; Dorset; Ebco
12	M.S. Fittings	Raja; Sartaj; Nova or Equivalent
13	Pressed Steel Frame / Moulded Steel Frames	AGEW; Raumplus/ Raumus; Shiva; NCL
14	Paints	Asian Paints; Berger; Nerolac; Akzo Nobel (ICI Dulux); Shalimar
15	Waterproof Paint	Asian Apex; Super Snowcem
16	Locks	Godrej; Geze; Hettich; Dorset; Ozone
17	Ceramic / Vitrified Tiles/ Terrazzo tile	Nitco; Kajaria; Somany; Johnson or Equivalent
18	White Cement	Birla White; JK White; Ambuja
19	PVC Fixtures	Caliplast; Brite; Fizopan
20	AAC / Aerated Autoclaved Concrete Blocks	BILT; Biltech; Siporex; UltraTech
21	Waterproofing	Dr. Fixit; Fosroc; Sika; Pidilite; STP
22	Fasteners / Anchors / Firestops	Hilti; Fischer; Rawlplug; 3M
23	Building Chemicals / Admixtures	Hilti; Fosroc; BASF; Sika; MYK Arment
24	Silicone Sealants	Dow Corning; GE; Wacker; Sika
25	VHB Tape / Expandable Polystyrene	3M
26	Glass and Mirror	Saint Gobain; Guardian; Asahi; AIS
27	Aluminium Extruded Sections	Jindal Aluminium; Hiindalco or Equivalent
28	Polycarbonate	GE Lexan; Danpalon; Palram; Gallina
29	Door / Window Fittings SS 304 / 316	Hettich; Hafele; Ozone; Kich, Dorset
30	Heavy Duty Door Closers / Floor Spring / Auto Doors	Dorma; Geze; Hettich; Briton; Ozone, Dorset
31	Hardware & Fittings	Hettich; Hafele; Kich; Dorma; Geze; Dorset; Ozone
32	Tile Adhesives	Weber; Lafarge; Kiesel; Latocrete; MYK
33	SS Railings – 304 / 316 Grade	Ozone, Jindal Apollo or Equivalent
34	Rebar / Chemical Anchors	Hilti; Fischer; Fosroc
35	Glass	Saint Gobain; Guardian; Glaverbel; Asahi
36	Glass Plain Sheet	Saint Gobain; Guardian; HNG; Asahi
37	Mirror	Saint Gobain; Guardian; Asahi
38	Cubicle Partitions	Merino-Besco; Trespa; Dorma
39	False Ceiling – Gypsum	Gyproc; Knauf Danoline; USG Boral; ACC or equivalent
40	False Ceiling – Grid Tiles	Ecophon; Armstrong; Knauf Danoline; Anutone; USG Boral or equivalent
41	Acoustic Panels – Gypsum	Gyproc-SG; Anutone; Knauf Danoline
42	Acoustic Panels – Sound Soak	Gyproc-SG; Armstrong; Anutone; Permaphone
43	Wall Panelling – Acoustics	Anutone; Armstrong; Gyproc-SG; Earcons; Dexune, Everest or equivalent
44	Exterior Cladding – HPL	Everest
45	Exterior Aluminium Louvers / Grills / Building Skin	Fameline; Renson; Hunter Douglas
46	Insulation – Expanded Polystyrene / Glasswool	Owens Corning; UP Twiga; Kimmco; Rockwool
47	Furniture	Godrej Interio; Wipro Furniture; Ergo Space; Ergotouch; Featherlite; EkDesign; Pavilions; Durian; Haworth
48	Deck Flooring	Exterpark; Okaywood; Squarefoot; Tarkett
49	Sliding Folding Opaque Partition Systems	Dorma
50	Sliding Folding Glazed Framed Partitions	Hawa; Solarlux
51	Operable Wall & Glass Stack Systems	Lotus; Dorma Huppe
52	PVC Water Tanks	Sintex; Vectus; Supreme
53	Vanity Blinds / Screen	Vista, D Décor



C. C ELECTRICAL		
S.No	Item Description	Approved Makes
1	UPS – Critical Load	Vertiv; Schneider; Socomec; Delta; TMEIC
2	UPS – Non Critical Load	Vertiv; Schneider; Socomec; Delta; Numeric; TMEIC; BPE
3	On Load Change Over Switch	Socomec; Siemens; L&T; Schneider; HPL
4	Off Load Change Over Switch	Socomec; Siemens; L&T; Schneider; HPL
5	ACB	Siemens; Schneider; L&T; ABB; Legrand
6	MCCB	Siemens; Schneider; L&T; ABB; Legrand
7	Contactors / Release / MPCB	Siemens; Schneider; L&T
8	Automatic Transfer Switch (ATS)	Emerson; Cummins; ASCO-Schneider; Socomec
9	Static Transfer Switch (STS)	Vertiv; Schneider; Delta; Socomec
10	TVSS / SPD	DEHN; Phoenix; Emerson; Schneider
11	Digital Meters	Conzerv; Socomec; Siemens; AE; L&T; Schneider
12	KWH / DLM / MDC Meters	Conzerv; Socomec; Siemens; AE; L&T; Schneider
13	MCB / ELMCB / ELCB	Siemens Betaguard; Schneider Acti9; Legrand DX3; L&T
14	Protection Relays	Areva; L&T; Siemens; Minilec; Alsthom
15	HRC Fuses and Fuse Fittings	Siemens; HPL; L&T; Legrand
16	Capacitors	Siemens; Ducati; Schneider; L&T
17	Capacitor Control Relay	Siemens; L&T; EPCOS
18	DG Synchronising & AMF Relay	Woodward; Siemens; Schneider
19	PLC	Siemens; Allen Bradley; Schneider
20	Push Buttons and Indication Lamps	Siemens; Schneider; Technic; Elmeasure
21	Selector Switch	Siemens; Sulzer; Kaycee
22	PDU with BCM & K-Rated Isolation Transformer	Datsons; SGB; MGM; Vertiv; Delta; Schneider
23	BCM (Branch Circuit Monitor)	ABB; Schneider; Socomec
24	LT Panel Builder	Tricolite; Adlec; Load Control; Sudhir; EAP; Engineers and Engineers; PACE; MAK
25	TTA Panel	Schneider Blokset; Siemens SIEPAN; L&T; ABB MNS
26	Main Bus Trunking System	Siemens; Schneider; L&T; Legrand; C&S
27	LT Copper / Aluminium Cables	Polycab; Finolex; RR Kabel, Havells
28	Copper HRFR / Nyvin / Uninyvin Cables	IGI; Miracle; Flexon
29	HT Cable Termination	Raychem; M-Seal
30	Cable Tray – Ladder / Perforated / HDG	Storack; Legrand; Bhushan (BEC); ELCON; Supermax; OBO Bettermann
31	Raceways	Slotco; Legrand
32	Cable Glands	Comet; Jainsons; Pyramids; LAPP
33	Lugs	Dowells; Jainsons; Pyramids; LAPP
34	MS Conduits & Accessories	AKG; Supreme; Bharath; GB; Precision
35	FRLS PVC Conduit & Accessories	Avon; Precision; BEC
36	PVC-FRLSH Copper Wires	Polycab; Finolex; LAPP; L&T; Havells; KEI; RR Kabel
37	FS Mica Tape Fire Survival Cables	Polycab; Finolex; LAPP; Havells; KEI; RR Kabel
38	PVC Insulation Tape	Steel Grip; 3M; Euro
39	Switches & Socket Outlets	Clipsal; Crabtree; L&T Entice; Anchor Roma; Panasonic
40	Distribution Boards	Siemens; Schneider; Legrand; L&T; Anchor Roma
41	Industrial Plug & Sockets – Metal Box	Schneider; Siemens; L&T; Legrand; Gewiss; Neptune
42	Industrial Plug & Sockets – Polycarbonate	Schneider Clipsal; Siemens; L&T; Gewiss; Legrand; C&S
43	Telephone Wire / Cat5 / Cat6	AMP , D LINK Belden Equivelant
44	Terminal Blocks	Elmex
45	Toggle Switches	Kaycee; Switchmart
46	Lighting Fixture – Internal	Philips; Wipro; Havells; Syska; GE; Mayfair
47	External / Decorative Lighting Fixture	Philips; Wipro; Havells; GE; Mayfair; Halomax
48	Lighting Control / Occupancy / Motion Sensor	Philips; Wipro; Havells; Honeywell
49	Flameproof Lighting and Switches	Baliga; FCG; Bajaj; Anchor; L&T
50	Lamps	Philips; Wipro; Havells; Bajaj; Syska; GE; Thom
51	Lightning Streamer / Arrestor	Erico; DEHN; Duval Messien
52	Maintenance Free Earthing	Erico; DEHN; Ashlok
53	Exhaust Fans & Ceiling Fans	Crompton Greaves; Havells;



D. D. HVAC

S.No	Item Description	Approved Makes
1	VRF / VRV / Package Units /Cassette Units/ Split Units	Daikin; Toshiba; Mitsubishi Electric; Samsung
2	Inline Fans	Caryaire / Flakt; Kruger
3	Axial Fans	Flaktwood; Kruger; GEC
4	Propeller Fans	Alstom Marathon; Crompton
5	Electric Motors (Energy Efficient)	Siemens; Crompton; Kirloskar
6	Condensing Units / Air Cooled Split Units	Carrier; Hitachi; Daikin; Voltas; Samsung
7	Air Washer / Wetting Pads	Roots Air; Ambassador; Humidin; Zeco
8	Two Way / Three Way Valves	Siemens; Honeywell; Belimo; Danfoss
9	Pressure Independent Valves	Siemens; Honeywell; Belimo; Danfoss
10	Motorized Actuators	Siemens; Honeywell; Belimo; Danfoss
11	Butterfly / Check Valves (Water Duty)	Siemens; Honeywell; Belimo; Danfoss
12	Gate Valves	Leader; Audco; Advance
13	Balancing Valves	Advance; C&R
14	Ball Valves with / without Strainer	Rapidcool; Emerald
15	Pre Filters	Thermadyne; Anfilco
16	Pot Strainers / Y Strainers	Emerald; Flowel
17	Pressure Gauges / Thermometers	Emerald; Fiebig; Flowel; Wika
18	Water Flow Switch	Rapidcool; Danfoss
19	Pan Humidifier	Rapidcontrol; Emerald; Khokar
20	Automatic Air Vent	Flamco; Amtrol; Rapid
21	Factory Made Duct	Rollastar; Zeco; AIR-MAX; Ductofab
22	Air Distribution / GI Sheets	Tata; Jindal; SAIL
23	Aluminium Sheets / Extrusions	Hindalco; Jindal; Alco; Balco
24	Extruded Aluminium Grilles / Diffusers	Caryaire; AIR-MAX; Systemair; Ravistar
25	Fire Sealant	3M; Hilti
26	Expanded Polystyrene Insulation	Beardsell; Styrene Packings; Indian Packaging Services
27	Closed Cell Polyethylene Insulation	Trocellan; Paramount
28	Nitrile Rubber – FM Global Standard	Armaflex; K-Flex; Armacell; A-Flex; Thermobreak
29	Under Deck Insulation	UP Twiga; Owens Corning
30	Fibreglass Insulation / RP Tissue	UP Twiga; Owens Corning
31	PUF Section for Pipe Support / Polyurethane Foam	Lloyd; Malanpur
32	Vibration Isolators	Resistoflex; Flexionics; Dunlop
33	False Floor	Uniflair; United Insulation; Kingspan; Huatong
34	False Ceiling	Armstrong; Durlum
35	Gypsum	ACC; India Gypsum; Gyproc Xpert
36	Ply Sheet / Marine Board	Greenply; Novateak; Century
37	Copper Pipe Makes	Mehta Tubes, Indigo Copper Tubes, Rajco Copper or equivalent



E. E PLUMBING FIRE

S.No	Item Description	Approved Makes
1	Sanitary Ware – WC / Urinal / Wash Basin	Jaquar; Hindware; Parryware; American Standard; Kohler
2	Seat Covers	Commander heavy duty
3	CP Fittings & Bathroom Accessories	Jaquar; Grohe; Kohler; Hindware
4	Stainless Steel Sink	Nirali; AMC; Jayna; Carysil; Franke
5	Ball Valves	Zoloto; ARCO; CIM; Leader; Sant
6	Butterfly Valves	Audco; Advance; C&R
7	Non Return Valves	Leader; Zoloto; Advance; IVC
8	CI Manhole Covers / Gratings	Neco; RIF; B.C.
9	Stoneware Pipes / Traps	Perfect; Bum; Anand
10	UPVC Pipe Fittings	Kitec; Supreme; Finolex
11	SFRC Manhole Cover / Grating	K.K. Manhole; S.K. Precast Concrete
12	RCC Pipes	Jain Spun Pipe; Pragati
13	Automatic Flushing Cistern	AOS; Angash International
14	Water Supply Pumps	Grundfos; Calpeda; KSB; Kirloskar
15	Gun Metal Ball / Gate Valves	Leader; Sant; Advance; Zoloto
16	Fire Extinguishers – ISI Marked	CeaseFire; Minimax; Safeguard; Safex
17	Announcement Panel	Daksh; Agni; ASE
18	PPSU Pipe	Poloplast
19	CPVC Pipes	Astral; Supreme and Equivalent
20	Concealed Cisterns	Geberit; Kohler; Jaquar
21	UPVC Pipes	Astral; Supreme; Finolex; Prince
22	Water Storage Tanks	Sintex; Vectus; Supreme
23	Soap Dispenser / Paper Dispenser	Dolphy; Bobrick; Jaquar
24	Hand Dryers	Dyson; Euronics
25	Grab Bars / Toilet Accessories	Jaquar; Kohler; Grohe; Bobrick
26	Mirror Cabinets	Jaquar; Kohler

F. F LV SECURITY IBMS

S.No	Item Description	Approved Makes
1	LAN Product Supply	Tyco; Panduit; Legrand; D-Link; Finolex; R&M
2	Racks	APW; Emerson; Rittal; Netrack
3	CCTV Cameras (IP)	Hikvision; Samsung; UTC; Honeywell; Bosch
4	Video Management Software / NVR	Bosch BVMS; Siemens; Honeywell; JCI American Dynamics
5	Video Servers & PC	IBM; Dell; HP
6	Video Wall LED Display	Samsung; LG; Sony
7	Video Controller	Christie; Kramer; Extron
8	Access Control Server / Visitor Management System	Honeywell Tema; Siemens Sipass; Bosch; JCI CEM
9	Controllers / Access Control Hub	Honeywell; Siemens; Bosch; JCI
10	Card Reader / Card	HID
11	Bio Metric Verification	ELSS or Equivalent
12	Aspirating Smoke Detection System	XTRALIS; Air sense; PROTEC
13	Electronic Sounder with Strobe	PCD; Ravel; Notifier
14	Public Address Speakers	Bosch; Honeywell; Ahuja
15	Amplifiers	Bosch; Honeywell; Ateis; Ahuja
16	System Controller / Call Stations	Bosch; Honeywell; Ateis; Ahuja
17	Fire / Gas Suppression Panel	Pyroprotec; Softchip; ERTL approved make
18	EM-Lock	BELL/ALGETEC/Dorma
19	Electronic Push Button Panic Switch	BELL/ALGETEC/Dorma

