

SMI UNIVERSITY
FACULTY OF
INFORMATION
TECHNOLOGY



Sindh Madressatul Islam University

**Tender for Supplying, Installation, Testing & Commissioning of
Variable Refrigerant Flow System for I.T Block Sindh Madressatul
Islam University (SMIU) City Campus Karachi**



TENDER DOCUMENTS

- Conditions of Contract
- Technical Specifications
- Bill of Quantities
- Drawings



EA Consulting Pvt Ltd

ARCHITECTURE | ENGINEERING | PROJECT MANAGEMENT
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CONDITIONS OF CONTRACT

SINDH PUBLIC PROCUREMENT REGULATORY AUTHORITY

STANDARD FORM OF BIDDING DOCUMENT FOR PROCUREMENT OF GOODS & SERVICES

**Tender For Supplying, Installation, Testing &
Commissioning of VRF System for I.T Block Sindh
Madressatul Islam University (SMIU) City Campus,
Karachi.**

PART ONE (FIXED)

- Instructions to Bidders (ITB)
- General Conditions of Contract (GCC)

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Instructions to Bidders

A. Introduction

1. Source of Funds

- 1.1 The Procuring agency has received grant from government as indicated in the bid data in various currencies towards the cost of the project /schemes specified in the bid data and it is intended that part of the proceeds of this grant will be applied to eligible payments under the contract for which these bidding documents are issued.
- 1.2 The Project Agreement prohibits a withdrawal from the allocated fund account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Federal Government/ Sindh Government, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the Procuring agency shall derive any rights from the Project Agreement or have any claim to the allocated fund proceeds.

2. Eligible Bidders

- 2.1 This Invitation for Bids is open to all suppliers from eligible source as defined in the SPP Rules, 2010 (Amended 2019) and its Bidding Documents except as provided hereinafter.
- 2.2 Bidders should not be associated, or have been associated in the past, directly or indirectly, with a firm or any of its affiliates which have been engaged by the Procuring agency to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the goods to be purchased under this Invitation for Bids.
- 2.3 Government-owned enterprises in the Province of Sindh may participate only if they are legally and financially autonomous, if they operate under commercial law, and if they are not a dependent agency of the Government of Sindh.
- 2.4 Bidders shall not be eligible to bid if they are under a declaration of ineligibility for corrupt and fraudulent practices issued by the any government organization in accordance with sub clause 34.1

- 3. Eligible Goods and Services**
- 3.1 All goods and related services to be supplied under the contract shall have their origin in eligible source countries, defined in the SPP Rules, 2010 (amended 2019) and its Bidding Documents, and all expenditures made under the contract will be limited to such goods and services.
- 3.2 For purposes of this clause, “origin” means the place where the goods are mined, grown, or produced, or the place from which the related services are supplied. Goods are produced when, through manufacturing, processing, or substantial and major assembly of components, a commercially-recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.
- 3.3 The origin of goods and services is distinct from the nationality of the Bidder.
- 4. Cost of Bidding**
- 4.1 The Bidder shall bear all costs associated with the preparation and submission of its bid, and the Procuring agency named in the Bid Data Sheet, hereinafter referred to as “the Procuring agency,” will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

B. The Bidding Documents

- 5. Content of Bidding Documents**
- 5.1 the bidding documents include:
- (a) Instructions to Bidders (ITB)
 - (b) Bid Data Sheet
 - (c) General Conditions of Contract (GCC)
 - (d) Special Conditions of Contract (SCC)
 - (e) Schedule of Requirements
 - (f) Technical Specifications
 - (g) Bid Form and Price Schedules
 - (h) Bid Security Form
 - (i) Contract Form
 - (j) Performance Security Form
 - (k) Manufacturer’s Authorization Form
- 5.2 The Bidder is expected to examine all instructions, forms, terms, and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or to submit a bid not substantially responsive to the bidding documents in every respect will be at the Bidder’s risk and may result in the rejection of its bid.

- 6. Clarification of Bidding Documents** 6.1 A interested Bidder requiring any clarification of the bidding documents may notify the Procuring agency in writing. The Procuring agency will respond in writing to any request for clarification of the bidding documents which it receives no later than three working days prior to the deadline for the submission of bids prescribed in the Bid Data Sheet. Written copies of the Procuring agency's response (including an explanation of the query but without identifying the source of inquiry) will be sent to all interested bidders that have received the bidding documents.
- 7. Amendment of Bidding Documents** 7.1 At any time prior to the deadline for submission of bids, the Procuring agency, for any reason, whether at its own initiative or in response to a clarification requested by a interested Bidder, may modify the bidding documents by amendment.
- 7.2 All interested bidders that have received the bidding documents will be notified of the amendment in writing, and will be binding on them.
- 7.3 In order to allow interested bidders reasonable time in which to take the amendment into account in preparing their bids, the Procuring agency, at its discretion, may extend the deadline for the submission of bids.

C. Preparation of Bids

- 8. Language of Bid** 8.1 The bid prepared by the Bidder, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Procuring agency shall be written in the language specified in the Bid Data Sheet. Supporting documents and printed literature furnished by the Bidder may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the Bid Data Sheet, in which case, for purposes of interpretation of the Bid, the translation shall govern.
- 9. Documents Comprising the Bid** 9.1 The bid prepared by the Bidder shall comprise the following components:
- (a) a Bid Form and a Price Schedule completed in accordance with ITB Clauses 10, 11, and 12;
 - (b) documentary evidence established in accordance with ITB

Clause 13 that the Bidder is eligible to bid and is qualified to perform the contract if its bid is accepted;

(c) documentary evidence established in accordance with ITB Clause 14 that the goods and ancillary services to be supplied by the Bidder are eligible goods and services and conform to the bidding documents; and

(d) bid security furnished in accordance with ITB Clause 15.

10. Bid Form

10.1 The Bidder shall complete the Bid Form and the appropriate Price Schedule furnished in the bidding documents, indicating the goods to be supplied, a brief description of the goods, their country of origin, quantity, and prices.

11. Bid Prices

11.1 The Bidder shall indicate on the appropriate Price Schedule the unit prices (where applicable) and total bid price of the goods it proposes to supply under the contract.

11.2 Prices indicated on the Price Schedule shall be delivered duty paid (DDP) prices. The price of other (incidental) services, if any, listed in the Bid Data Sheet will be entered separately.

11.3 The Bidder's separation of price components in accordance with ITB Clause 11.2 above will be solely for the purpose of facilitating the comparison of bids by the Procuring agency and will not in any way limit the Procuring agency's right to contract on any of the terms offered.

11.5 Prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account, unless otherwise specified in the Bid Data Sheet. A bid submitted with an adjustable price quotation will be treated as nonresponsive and will be rejected, pursuant to ITB Clause 24. If, however, in accordance with the Bid Data Sheet, prices quoted by the Bidder shall be subject to adjustment during the performance of the contract, a bid submitted with a fixed price quotation will not be rejected, but the price adjustment would be treated as zero.

12. Bid Currencies 12.1 Prices shall be quoted in Pak Rupees unless otherwise specified in the Bid Data Sheet.

13. Documents Establishing Bidder's

13.1 Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, documents establishing the Bidder's eligibility to bid and its qualifications to perform the contract if its bid is accepted.

**Eligibility and
Qualification**

- 13.2 The documentary evidence of the Bidder's eligibility to bid shall establish to the Procuring agency's satisfaction that the Bidder, at the time of submission of its bid, is from an eligible country as defined under ITB Clause 2.
- 13.3 The documentary evidence of the Bidder's qualifications to perform the contract if its bid is accepted shall establish to the Procuring agency's satisfaction:
- (a) that, in the case of a Bidder offering to supply goods under the contract which the Bidder did not manufacture or otherwise produce, the Bidder has been duly authorized by the goods' Manufacturer or producer to supply the goods in the Procuring agency's country;
 - (b) that the Bidder has the financial, technical, and production capability necessary to perform the contract;
 - (c) that, in the case of a Bidder not doing business within the Procuring agency's country, the Bidder is or will be (if awarded the contract) represented by an Agent in that country equipped, and able to carry out the Supplier's maintenance, repair, and spare parts-stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications; and
 - (d) that the Bidder meets the qualification criteria listed in the Bid Data Sheet.

**14. Documents
Establishing
Goods'
Eligibility and
Conformity to
Bidding
Documents**

- 14.1 Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, documents establishing the eligibility and conformity to the bidding documents of all goods and services which the Bidder proposes to supply under the contract.
- 14.2 The documentary evidence of the eligibility of the goods and services shall consist of a statement in the Price Schedule of the country of origin of the goods and services offered which shall be confirmed by a certificate of origin issued at the time of shipment.
- 14.3 The documentary evidence of conformity of the goods and services to the bidding documents may be in the form of literature, drawings, and data, and shall consist of:
- (a) a detailed description of the essential technical and

performance characteristics of the goods;

- (b) a list giving full particulars, including available sources and current prices of spare parts, special tools, etc., necessary for the proper and continuing functioning of the goods for a period to be specified in the Bid Data Sheet, following commencement of the use of the goods by the Procuring agency; and
- (c) an item-by-item commentary on the Procuring agency's Technical Specifications demonstrating substantial responsiveness of the goods and services to those specifications, or a statement of deviations and exceptions to the provisions of the Technical Specifications.

14.4 For purposes of the commentary to be furnished pursuant to ITB Clause 14.3(c) above, the Bidder shall note that standards for workmanship, material, and equipment, as well as references to brand names or catalogue numbers designated by the Procuring agency in its Technical Specifications, are intended to be descriptive only and not restrictive. The Bidder may substitute alternative standards, brand names, and/or catalogue numbers in its bid, provided that it demonstrates to the Procuring agency's satisfaction that the substitutions ensure substantial equivalence to those designated in the Technical Specifications.

15. Bid Security

15.1 Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, a bid security in the amount specified in the Bid Data Sheet.

15.2 The bid security is required to protect the Procuring agency against the risk of Bidder's conduct which would warrant the security's forfeiture, pursuant to ITB Clause 15.7.

15.3 The bid security shall be in Pak. Rupees and shall be in one of the following forms:

- (a) a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the Procuring agency's country, in the form provided in the bidding documents or another form acceptable to the Procuring agency and valid for thirty (30) days beyond the validity of the bid; or
- (b) Irrevocable cashable on-demand Bank call-deposit.

15.4 Any bid not secured in accordance with ITB Clauses 15.1 and 15.3 will be rejected by the Procuring agency as nonresponsive, pursuant to ITB Clause 24.

- 15.5 Unsuccessful bidders' bid security will be discharged or returned as promptly as possible but not later than thirty (30) days after the expiration of the period of bid validity prescribed by the Procuring agency pursuant to ITB Clause 16.
- 15.6 The successful Bidder's bid security will be discharged upon the Bidder signing the contract, pursuant to ITB Clause 32, and furnishing the performance security, pursuant to ITB Clause 33.
- 15.7 The bid security may be forfeited:
- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Bid Form; or
 - (b) in the case of a successful Bidder, if the Bidder fails:
 - (i) to sign the contract in accordance with ITB Clause 32;
 - or**
 - (ii) to furnish performance security in accordance with ITB Clause 33.

16. Period of Validity of Bids

- 16.1 Bids shall remain valid for the period specified in the Bid Data Sheet after the date of bid opening prescribed by the Procuring agency, pursuant to ITB Clause 19. A bid valid for a shorter period shall be rejected by the Procuring agency as nonresponsive.
- 16.2 In exceptional circumstances, the Procuring agency may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. The bid security provided under ITB Clause 15 shall also be suitably extended. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request will not be required nor permitted to modify its bid, except as provided in the bidding document.

17. Format and Signing of Bid

- 17.1 The Bidder shall prepare an original and the number of copies of the bid indicated in the Bid Data Sheet, clearly marking each "ORIGINAL BID" and "COPY OF BID," as appropriate. In the event of any discrepancy between them, the original shall govern.
- 17.2 The original and the copy or copies of the bid shall be typed or written in indelible ink and shall be signed by the Bidder or a

person or persons duly authorized to bind the Bidder to the contract. All pages of the bid, except for un-amended printed literature, shall be initialed by the person or persons signing the bid.

17.3 Any interlineations, erasures, or overwriting shall be valid only if they are initialed by the person or persons signing the bid.

17.4 The Bidder shall furnish information as described in the Form of Bid on commissions or gratuities, if any, paid or to be paid to agents relating to this Bid, and to contract execution if the Bidder is awarded the contract.

D. Submission of Bids

18. Sealing and Marking of Bids

18.1 The Bidder shall seal the original and each copy of the bid in separate envelopes, duly marking the envelopes as “ORIGINAL” and “COPY.” The envelopes shall then be sealed in an outer envelope.

18.2 The inner and outer envelopes shall:

- (a) be addressed to the Procuring agency at the address given in the Bid Data Sheet; and
- (b) bear the Project name indicated in the Bid Data Sheet, the Invitation for Bids (IFB) title and number indicated in the Bid Data Sheet, and a statement: “DO NOT OPEN BEFORE,” to be completed with the time and the date specified in the Bid Data Sheet, pursuant to ITB Clause 2.2.

18.3 The inner envelopes shall also indicate the name and address of the Bidder to enable the bid to be returned unopened in case it is declared “late”.

18.4 If the outer envelope is not sealed and marked as required by ITB Clause 18.2, the Procuring agency will assume no responsibility for the bid’s misplacement or premature opening.

19. Deadline for Submission of Bids

19.1 Bids must be received by the Procuring agency at the address specified under ITB Clause 18.2 no later than the time and date specified in the Bid Data Sheet.

19.2 The Procuring agency may, at its discretion, extend this deadline for the submission of bids by amending the bidding documents in accordance with ITB Clause 7, in which case all rights and

obligations of the Procuring agency and bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

20. Late Bids

20.1 Any bid received by the Procuring agency after the deadline for submission of bids prescribed by the Procuring agency pursuant to ITB Clause 19 will be rejected and returned unopened to the Bidder.

21. Modification and Withdrawal of Bids

21.1 The Bidder may modify or withdraw its bid after the bid's submission, provided that written notice of the modification, including substitution or withdrawal of the bids, is received by the Procuring agency prior to the deadline prescribed for submission of bids.

21.2 The Bidder's modification or withdrawal notice shall be prepared, sealed, marked, and dispatched in accordance with the provisions of ITB Clause 18. by a signed confirmation copy, postmarked not later than the deadline for submission of bids.

21.3 No bid may be modified after the deadline for submission of bids.

21.4 No bid may be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Bid Form. Withdrawal of a bid during this interval may result in the Bidder's forfeiture of its bid security, pursuant to the ITB Clause 15.7.

E. Opening and Evaluation of Bids

22. Opening of Bids by the Procuring agency

22.1 The Procuring agency will open all bids in the presence of bidders' representatives who choose to attend, at the time, on the date, and at the place specified in the Bid Data Sheet. The bidders' representatives who are present shall sign a register evidencing their attendance.

22.2 The bidders' names, bid modifications or withdrawals, bid prices, discounts, and the presence or absence of requisite bid security and such other details as the Procuring agency, at its discretion, may consider appropriate, will be announced at the opening. No bid shall be rejected at bid opening, except for late bids, which shall be returned unopened to the Bidder pursuant to ITB Clause 20.

22.3 Bids (and modifications sent pursuant to ITB Clause 21.2) that are not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances. Withdrawn bids will be returned unopened to the bidders.

22.4 The Procuring agency will prepare minutes of the bid opening.

23. Clarification of Bids

23.1 During evaluation of the bids, the Procuring agency may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing, and no change in the prices or substance of the bid shall be sought, offered, or permitted.

24. Preliminary Examination

24.1 The Procuring agency will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.

24.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected. If the Supplier does not accept the correction of the errors, its bid will be rejected, and its bid security may be forfeited. If there is a discrepancy between words and figures, the amount in words will prevail.

24.3 The Procuring agency may waive any minor informality, nonconformity, or irregularity in a bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.

24.4 Prior to the detailed evaluation, pursuant to ITB Clause 25 the Procuring agency will determine the substantial responsiveness of each bid to the bidding documents. For purposes of these Clauses, a substantially responsive bid is one which conforms to all the terms and conditions of the bidding documents without material deviations. Deviations from, or objections or reservations to critical provisions, **such as** those concerning Bid Security (ITB Clause 15), Applicable Law (GCC Clause 30), and Taxes and Duties (GCC Clause 32), will be deemed to be a material deviation. The Procuring agency's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

24.5 If a bid is not substantially responsive, it will be rejected by the Procuring agency and may not subsequently be made responsive by the Bidder by correction of the nonconformity.

25. Evaluation and Comparison of Bids

25.1 The Procuring agency will evaluate and compare the bids which have been determined to be substantially responsive, pursuant to ITB Clause 24.

25.2 The Procuring agency's evaluation of a bid will be on delivered duty paid (DDP) price inclusive of prevailing duties and will exclude any allowance for price adjustment during the period of execution of the contract, if provided in the bid.

25.3 The Procuring agency's evaluation of a bid will take into account, in addition to the bid price quoted in accordance with ITB Clause 11.2, one or more of the following factors as specified in the Bid Data Sheet, and quantified in ITB Clause 25.4:

- (a) incidental costs
- (b) delivery schedule offered in the bid;
- (c) deviations in payment schedule from that specified in the Special Conditions of Contract;
- (d) the cost of components, mandatory spare parts, and service;
- (e) the availability Procuring agency of spare parts and after-sales services for the equipment offered in the bid;
- (f) the projected operating and maintenance costs during the life of the equipment;
- (g) the performance and productivity of the equipment offered; and/or
- (h) other specific criteria indicated in the Bid Data Sheet and/or in the Technical Specifications.

25.4 For factors retained in the Bid Data Sheet pursuant to ITB 25.3, one or more of the following quantification methods will be applied, as detailed in the Bid Data Sheet:

- (a) Incidental costs provided by the bidder will be added by Procuring agency to the delivered duty paid (DDP) price at

the final destination.

(b) *Delivery schedule.*

(i) The Procuring agency requires that the goods under the Invitation for Bids shall be delivered at the time specified in the Schedule of Requirements which will be treated as the base, a delivery “adjustment” will be calculated for bids by applying a percentage, specified in the Bid Data Sheet, of the DDP price for each week of delay beyond the base, and this will be added to the bid price for evaluation. No credit shall be given to early delivery.

or

(ii) The goods covered under this invitation are required to be delivered (shipped) within an acceptable range of weeks specified in the Schedule of Requirement. No credit will be given to earlier deliveries, and bids offering delivery beyond this range will be treated as nonresponsive. Within this acceptable range, an adjustment per week, as specified in the Bid Data Sheet, will be added for evaluation to the bid price of bids offering deliveries later than the earliest delivery period specified in the Schedule of Requirements.

or

(iii) The goods covered under this invitation are required to be delivered in partial shipments, as specified in the Schedule of Requirements. Bids offering deliveries earlier or later than the specified deliveries will be adjusted in the evaluation by adding to the bid price a factor equal to a percentage, specified in the Bid Data Sheet, of DDP price per week of variation from the specified delivery schedule.

(c) *Deviation in payment schedule.*

(i) Bidders shall state their bid price for the payment schedule outlined in the SCC. Bids will be evaluated on the basis of this base price. Bidders are, however, permitted to state an alternative payment schedule and indicate the reduction in bid price they wish to offer for such alternative payment schedule. The Procuring agency may consider the alternative payment schedule offered by the selected Bidder.

or

(ii) The SCC stipulates the payment schedule offered by

the Procuring agency. If a bid deviates from the schedule and if such deviation is considered acceptable to the Procuring agency, the bid will be evaluated by calculating interest earned for any earlier payments involved in the terms outlined in the bid as compared with those stipulated in this invitation, at the rate per annum specified in the Bid Data Sheet.

(d) *Cost of spare parts.*

(i) The list of items and quantities of major assemblies, components, and selected spare parts, likely to be required during the initial period of operation specified in the Bid Data Sheet, is annexed to the Technical Specifications. The total cost of these items, at the unit prices quoted in each bid, will be added to the bid price.

or

(ii) The Procuring agency will draw up a list of high-usage and high-value items of components and spare parts, along with estimated quantities of usage in the initial period of operation specified in the Bid Data Sheet. The total cost of these items and quantities will be computed from spare parts unit prices submitted by the Bidder and added to the bid price.

or

(iii) The Procuring agency will estimate the cost of spare parts usage in the initial period of operation specified in the Bid Data Sheet, based on information furnished by each Bidder, as well as on past experience of the Procuring agency or other procuring agencies in similar situations. Such costs shall be added to the bid price for evaluation.

(e) *Spare parts and after sales service facilities in the Procuring agency's country.*

The cost to the Procuring agency of establishing the minimum service facilities and parts inventories, as outlined in the Bid Data Sheet or elsewhere in the bidding documents, if quoted separately, shall be added to the bid price.

(f) *Operating and maintenance costs.*

Since the operating and maintenance costs of the goods under procurement form a major part of the life cycle cost of the equipment, these costs will be evaluated in accordance with the criteria specified in the Bid Data Sheet or in the Technical Specifications.

(g) *Performance and productivity of the equipment.*

(i) Bidders shall state the guaranteed performance or efficiency in response to the Technical Specification. For each drop in the performance or efficiency below the norm of 100, an adjustment for an amount specified in the Bid Data Sheet will be added to the bid price, representing the capitalized cost of additional operating costs over the life of the plant, using the methodology specified in the Bid Data Sheet or in the Technical Specifications.

or

(ii) Goods offered shall have a minimum productivity specified under the relevant provision in the Technical Specifications to be considered responsive. Evaluation shall be based on the cost per unit of the actual productivity of goods offered in the bid, and adjustment will be added to the bid price using the methodology specified in the Bid Data Sheet or in the Technical Specifications.

(h) *Specific additional criteria indicated in the Bid Data Sheet and/or in the Technical Specifications.*

The relevant evaluation method shall be detailed in the Bid Data Sheet and/or in the Technical Specifications.

Alternative

25.4 Merit Point System:

The following merit point system for weighing evaluation factors can be applied if none of the evaluation methods listed in 25.4 above has been retained in the Bid Data Sheet. The number of points allocated to each factor shall be specified in the Bid Data Sheet.

[In the Bid Data Sheet, choose from the range of]

Evaluated price of the goods	60 to 90
Cost of common list spare parts	0 to 20
Technical features, and maintenance and operating costs	0 to 20
Availability of service and spare parts	0 to 20
Standardization	0 to 20
Total	100

The bid scoring the highest number of points will be deemed to be the lowest evaluated bid.

- 26. Contacting the Procuring agency**
- 26.1 Subject to ITB Clause 23, no Bidder shall contact the Procuring agency on any matter relating to its bid, from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Procuring agency, it should do so in writing.
- 26.2 Any effort by a Bidder to influence the Procuring agency in its decisions on bid evaluation, bid comparison, or contract award may result in the rejection of the Bidder's bid.

F. Award of Contract

- 27. Post-qualification**
- 27.1 In the absence of prequalification, the Procuring agency will determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated responsive bid is qualified to perform the contract satisfactorily, in accordance with the criteria listed in ITB Clause 13.3.
- 27.2 The determination will take into account the Bidder's financial, technical, and production capabilities. It will be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 13.3, as well as such other information as the Procuring agency deems necessary and appropriate.
- 27.3 An affirmative determination will be a prerequisite for award of the contract to the Bidder. A negative determination will result in rejection of the Bidder's bid, in which event the Procuring agency will proceed to the next lowest evaluated bid to make a similar determination of that Bidder's capabilities to perform satisfactorily.
- 28. Award Criteria**
- 28.1 Subject to ITB Clause 30, the Procuring agency will award the contract to the successful Bidder whose bid has been determined to be substantially responsive and has been determined to be the lowest evaluated bid, provided further that the Bidder is

determined to be qualified to perform the contract satisfactorily.

- 29. Procuring agency's Right to Vary Quantities at Time of Award**
- 29.1 The Procuring agency reserves the right at the time of contract award to increase or decrease, by the percentage indicated in the Bid Data Sheet, the quantity of goods and services originally specified in the Schedule of Requirements without any change in unit price or other terms and conditions.
- 30. Procuring agency's Right to Accept any Bid and to Reject any or All Bids**
- 30.1 The Procuring agency reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Procuring agency's action.
- 31. Notification of Award**
- 31.1 Prior to the expiration of the period of bid validity, the Procuring agency will notify the successful Bidder in writing by registered letter or by cable, to be confirmed in writing by registered letter, that its bid has been accepted.
- 31.2 The notification of award will constitute the formation of the Contract.
- 31.3 Upon the successful Bidder's furnishing of the performance security pursuant to ITB Clause 33, the Procuring agency will promptly notify each unsuccessful Bidder and will discharge its bid security, pursuant to ITB Clause 15.
- 32. Signing of Contract**
- 32.1 At the same time as the Procuring agency notifies the successful Bidder that its bid has been accepted, the Procuring agency will send the Bidder the Contract Form provided in the bidding documents, incorporating all agreements between the parties.
- 32.2 Within thirty (30) days of receipt of the Contract Form, the successful Bidder shall sign and date the contract and return it to the Procuring agency.
- 33 Performance Security**
- 33.1 Within twenty (20) days of the receipt of notification of award from the Procuring agency, the successful Bidder shall furnish the performance security in accordance with the Conditions of Contract, in the Performance Security Form provided in the bidding documents, or in another form acceptable to the Procuring agency.
- 33.2 Failure of the successful Bidder to comply with the requirement of ITB Clause 32 or ITB Clause 33.1 shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid

security, in which event the Procuring agency may make the award to the next lowest evaluated Bidder or call for new bids.

34. Corrupt or Fraudulent Practices

34.1 The Government of Sindh requires that Procuring agency's (including beneficiaries of donor agencies' loans), as well as Bidders/Suppliers/Contractors under Government-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the SPPRA, in accordance with the SPP Act, 2009 and Rules made thereunder:

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
 - (ii) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Procuring agency, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Procuring agency of the benefits of free and open competition;
- (b) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;
- (c) will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a Government-financed contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a Government-financed contract.

34.2 Furthermore, Bidders shall be aware of the provision stated in sub-clause 5.4 and sub-clause 24.1 of the General Conditions of Contract.

Part One - Section II.
General Conditions of Contract

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General Conditions of Contract

1. Definitions

1.1 In this Contract, the following terms shall be interpreted as indicated:

- (a) “The Contract” means the agreement entered into between the Procuring agency and the Supplier, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
- (b) “The Contract Price” means the price payable to the Supplier under the Contract for the full and proper performance of its contractual obligations.
- (c) “The Goods” means all of the equipment, machinery, and/or other materials which the Supplier is required to supply to the Procuring agency under the Contract.
- (d) “The Services” means those services ancillary to the supply of the Goods, such as transportation and insurance, and any other incidental services, such as installation, commissioning, provision of technical assistance, training, and other such obligations of the Supplier covered under the Contract.
- (e) “GCC” means the General Conditions of Contract contained in this section.
- (f) “SCC” means the Special Conditions of Contract.
- (g) “The Procuring agency” means the organization purchasing the Goods, as named in SCC.
- (h) “The Procuring agency’s country” is the country named in SCC.
- (i) “The Supplier” means the individual or firm supplying the Goods and Services under this Contract.
- (j) “The Project Site,” where applicable, means the place or places named in SCC.
- (k) “Day” means calendar day.

2. Application

2.1 These General Conditions shall apply to the extent that they are

not superseded by provisions of other parts of the Contract.

3. Country of Origin

3.1 All Goods and Services supplied under the Contract shall have their origin in the countries and territories eligible under the rules and further elaborated in the SCC.

3.2 For purposes of this Clause, “origin” means the place where the Goods were mined, grown, or produced, or from which the Services are supplied. Goods are produced when, through manufacturing, processing, or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.

3.3 The origin of Goods and Services is distinct from the nationality of the Supplier.

4.1 The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications, and, when no applicable standard is mentioned, to the authoritative standards appropriate to the Goods’ country of origin. Such standards shall be the latest issued by the concerned institution.

5. Use of Contract Documents and Information; Inspection and Audit by the Government

5.1 The Supplier shall not, without the Procuring agency’s prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the Procuring agency in connection therewith, to any person other than a person employed by the Supplier in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

5.2 The Supplier shall not, without the Procuring agency’s prior written consent, make use of any document or information enumerated in GCC Clause 5.1 except for purposes of performing the Contract.

5.3 Any document, other than the Contract itself, enumerated in GCC Clause 5.1 shall remain the property of the Procuring agency and shall be returned (all copies) to the Procuring agency on completion of the Supplier’s performance under the Contract if so required by the Procuring agency.

5.4 The Supplier shall permit the Procuring agency to inspect the Supplier's accounts and records relating to the performance of the Supplier and to have them audited by auditors appointed by the procuring agency, if so required.

6. Patent Rights

6.1 The Supplier shall indemnify the Procuring agency against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof in the Procuring agency's country.

7. Performance Security

7.1 Within twenty (20) days of receipt of the notification of Contract award, the successful Bidder shall furnish to the Procuring agency the performance security in the amount specified in SCC.

7.2 The proceeds of the performance security shall be payable to the Procuring agency as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

7.3 The performance security shall be denominated in the currency of the Contract acceptable to the Procuring agency and shall be in one of the following forms:

(a) a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the Procuring agency's country, in the form provided in the bidding documents or another form acceptable to the Procuring agency; or

(b) a cashier's or certified check.

7.4 The performance security will be discharged by the Procuring agency and returned to the Supplier not later than thirty (30) days following the date of completion of the Supplier's performance obligations under the Contract, including any warranty obligations, unless specified otherwise in SCC.

8. Inspections and Tests

8.1 The Procuring agency or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Contract specifications at no extra cost to the Procuring agency. SCC and the Technical Specifications shall specify what inspections and tests the Procuring agency requires and where they are to be conducted. The Procuring agency shall notify the Supplier in writing, in a timely manner, of the identity of any representatives retained for these purposes.

8.2 The inspections and tests may be conducted on the premises of the Supplier or its subcontractor(s), at point of delivery, and/or at

the Goods' final destination. If conducted on the premises of the Supplier or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Procuring agency.

- 8.3 Should any inspected or tested Goods fail to conform to the Specifications, the Procuring agency may reject the Goods, and the Supplier shall either replace the rejected Goods or make alterations necessary to meet specification requirements free of cost to the Procuring agency.
- 8.4 The Procuring agency's right to inspect, test and, where necessary, reject the Goods after the Goods' arrival in the Procuring agency's country shall in no way be limited or waived by reason of the Goods having previously been inspected, tested, and passed by the Procuring agency or its representative prior to the Goods' shipment from the country of origin.
- 8.5 Nothing in GCC Clause 8 shall in any way release the Supplier from any warranty or other obligations under this Contract.

9. Packing

- 9.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.
- 9.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified in SCC, and in any subsequent instructions ordered by the Procuring agency.

10. Delivery and Documents

- 10.1 Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in the Schedule of Requirements. The details of shipping and/or other documents to be furnished by the Supplier are specified in SCC.
- 10.2 Documents to be submitted by the Supplier are specified in SCC.

11. Insurance

11.1 The Goods supplied under the Contract shall be delivered duty paid (DDP) under which risk is transferred to the buyer after having been delivered, hence insurance coverage is sellers responsibility.

12. Transportation

12.1 The Supplier is required under the Contact to transport the Goods to a specified place of destination within the Procuring agency's country, transport to such place of destination in the Procuring agency's country, including insurance and storage, as shall be specified in the Contract, shall be arranged by the Supplier, and related costs shall be included in the Contract Price.

13. Incidental Services

13.1 The Supplier may be required to provide any or all of the following services, including additional services, if any, specified in SCC:

- (a) performance or supervision of on-site assembly and/or start-up of the supplied Goods;
- (b) furnishing of tools required for assembly and/or maintenance of the supplied Goods;
- (c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;
- (d) performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract; and
- (e) training of the Procuring agency's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods.

13.2 Prices charged by the Supplier for incidental services, if not included in the Contract Price for the Goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged for other parties by the Supplier for similar services.

14. Spare Parts

14.1 As specified in SCC, the Supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier:

- (a) such spare parts as the Procuring agency may elect to purchase from the Supplier, provided that this election shall not relieve the Supplier of any warranty obligations under the Contract; and
- (b) in the event of termination of production of the spare parts:
 - (i) advance notification to the Procuring agency of the pending termination, in sufficient time to permit the Procuring agency to procure needed requirements; and
 - (ii) following such termination, furnishing at no cost to the Procuring agency, the blueprints, drawings, and specifications of the spare parts, if requested.

15. Warranty

- 15.1 The Supplier warrants that the Goods supplied under the Contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier further warrants that all Goods supplied under this Contract shall have no defect, arising from design, materials, or workmanship (except when the design and/or material is required by the Procuring agency's specifications) or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions prevailing in the country of final destination.
- 15.2 This warranty shall remain valid for twelve (12) months after the Goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the Contract, or for eighteen (18) months after the date of shipment from the port or place of loading in the source country, whichever period concludes earlier, unless specified otherwise in SCC.
- 15.3 The Procuring agency shall promptly notify the Supplier in writing of any claims arising under this warranty.
- 15.4 Upon receipt of such notice, the Supplier shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective Goods or parts thereof, without costs to the Procuring agency.
- 15.5 If the Supplier, having been notified, fails to remedy the defect(s)

within the period specified in SCC, within a reasonable period, the Procuring agency may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Procuring agency may have against the Supplier under the Contract.

16. Payment

16.1 The method and conditions of payment to be made to the Supplier under this Contract shall be specified in SCC.

16.2 The Supplier's request(s) for payment shall be made to the Procuring agency in writing, accompanied by an invoice describing, as appropriate, the Goods delivered and Services performed, and by documents submitted pursuant to GCC Clause 10, and upon fulfillment of other obligations stipulated in the Contract.

16.3 Payments shall be made promptly by the Procuring agency, but in no case later than sixty (60) days after submission of an invoice or claim by the Supplier.

16.4 The currency of payment is Pak. Rupees.

17. Prices

17.1 Prices charged by the Supplier for Goods delivered and Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid, with the exception of any price adjustments authorized in SCC or in the Procuring agency's request for bid validity extension, as the case may be.

18. Change Orders

18.1 The Procuring agency may at any time, by a written order given to the Supplier pursuant to GCC Clause 31, make changes within the general scope of the Contract in any one or more of the following:

- (a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Procuring agency;
- (b) the method of shipment or packing;
- (c) the place of delivery; and/or
- (d) the Services to be provided by the Supplier.

18.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be

made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this clause must be asserted within thirty (30) days from the date of the Supplier's receipt of the Procuring agency's change order.

19. Contract Amendments

19.1 Subject to GCC Clause 18, no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

20. Assignment

20.1 The Supplier shall not assign, in whole or in part, its obligations to perform under this Contract, except with the Procuring agency's prior written consent.

21. Subcontracts

21.1 The Supplier shall notify the Procuring agency in writing of all subcontracts awarded under this Contract if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the Supplier from any liability or obligation under the Contract.

21.2 Subcontracts must comply with the provisions of GCC Clause 3.

22. Delays in the Supplier's Performance

22.1 Delivery of the Goods and performance of Services shall be made by the Supplier in accordance with the time schedule prescribed by the Procuring agency in the Schedule of Requirements.

22.2 If at any time during performance of the Contract, the Supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the Goods and performance of Services, the Supplier shall promptly notify the Procuring agency in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the Supplier's notice, the Procuring agency shall evaluate the situation and may at its discretion extend the Supplier's time for performance, with or without liquidated damages, in which case the extension shall be ratified by the parties by amendment of Contract.

22.3 Except as provided under GCC Clause 25, a delay by the Supplier in the performance of its delivery obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 23, unless an extension of time is agreed upon pursuant to GCC Clause 22.2 without the application of liquidated damages.

23. Liquidated

23.1 Subject to GCC Clause 25, if the Supplier fails to deliver any or

Damages

all of the Goods or to perform the Services within the period(s) specified in the Contract, the Procuring agency shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in SCC of the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the percentage specified in SCC. Once the maximum is reached, the Procuring agency may consider termination of the Contract pursuant to GCC Clause 24.

24. Termination for Default

24.1 The Procuring agency, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate this Contract in whole or in part:

- (a) if the Supplier fails to deliver any or all of the Goods within the period(s) specified in the Contract, or within any extension thereof granted by the Procuring agency pursuant to GCC Clause 22; or
- (b) if the Supplier fails to perform any other obligation(s) under the Contract.
- (c) if the Supplier, in the judgment of the Procuring agency has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this clause:

“corrupt practice” means the offering, giving, receiving or soliciting of any thing of value to influence the action of a public official in the procurement process or in contract execution.

“fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition.

24.2 In the event the Procuring agency terminates the Contract in whole or in part, pursuant to GCC Clause 24.1, the Procuring agency may procure, upon such terms and in such manner as it deems appropriate, Goods or Services similar to those

undelivered, and the Supplier shall be liable to the Procuring agency for any excess costs for such similar Goods or Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

25. Force Majeure 25.1 Notwithstanding the provisions of GCC Clauses 22, 23, and 24, the Supplier shall not be liable for forfeiture of its performance security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

25.2 For purposes of this clause, “Force Majeure” means an event beyond the control of the Supplier and not involving the Supplier’s fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the Procuring agency in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

25.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Procuring agency in writing of such condition and the cause thereof. Unless otherwise directed by the Procuring agency in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

26. Termination for Insolvency 26.1 The Procuring agency may at any time terminate the Contract by giving written notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Procuring agency.

27. Termination for Convenience 27.1 The Procuring agency, by written notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Procuring agency’s convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.

27.2 The Goods that are complete and ready for shipment within thirty (30) days after the Supplier’s receipt of notice of termination shall be accepted by the Procuring agency at the

Contract terms and prices. For the remaining Goods, the Procuring agency may elect:

- (a) to have any portion completed and delivered at the Contract terms and prices; and/or
- (b) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Services and for materials and parts previously procured by the Supplier.

28. Resolution of Disputes

28.1 The Procuring agency and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

28.2 If, after thirty (30) days from the commencement of such informal negotiations, the Procuring agency and the Supplier have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanisms specified in SCC. These mechanisms may include, but are not restricted to, conciliation mediated by a third party, adjudication in an agreed manner and/or arbitration.

29. Governing Language

29.1 The Contract shall be written in the language specified in SCC. Subject to GCC Clause 30, the version of the Contract written in the specified language shall govern its interpretation. All correspondence and other documents pertaining to the Contract which are exchanged by the parties shall be written in the same language.

30. Applicable Law

30.1 The Contract shall be interpreted in accordance with the laws of the Procuring agency's country, unless otherwise specified in SCC.

31. Notices

31.1 Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or by cable, telex, or facsimile and confirmed in writing to the other party's address specified in SCC.

31.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

32. Taxes and Duties

32.1 Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Goods to the Procuring agency.

SINDH PUBLIC PROCUREMENT REGULATORY AUTHORITY

STANDARD FORM OF BIDDING DOCUMENT FOR PROCUREMENT OF GOODS & SERVICES

**Tender For Supplying, Installation, Testing &
Commissioning of VRF System for I.T Block Sindh
Madressatul Islam University (SMIU) City Campus,
Karachi.**

PART TWO (PROCUREMENT SPECIFIC PROVISIONS)

- Invitation for Bids (IFB)
- Bid Data Sheet (BDS)
- Special Conditions of Contract (SCC)
- Schedule of Requirements
- Technical Specifications
- Sample Form
- Eligibility

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SAMPLE FORMS.....

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5. *Bank Guarantee for Advance Payment*.....
6. *Manufacturer's Authorization Form*.....



SINDH MADRESSATUL ISLAM UNIVERSITY

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Email: info@smiu.edu.pk , URL <http://www.smiu.edu.pk/>

NO. SMIU/TEND/2019-2020/12

Date: 20th December, 2019

NOTICE INVITING TENDER

Sealed bids on item rate basis are invited on prescribed bidding documents from experienced specialist vendors/firms interested to participate for the work mentioned below. The interested firms shall submit their tender based on single stage – one envelope procedure as per Rules No 46 (1) of SPPRA-Rules 2010 (Amended-2019): -

No	Name of Work	Bid Security	Tender Fee	Time for Completion
1.	SUPPLYING, INSTALLATION, TESTING & COMMISSIONING OF VRF SYSTEM FOR I.T BLOCK SINDH MADRESSATUL ISLAM UNIVERSITY (SMIU). CITY CAMPUS, KARACHI.	2% of Bid Price	Rs. 5,000/-	03 Months

Terms & Conditions:

- Interested firms or joint ventures can obtain Tender Documents from the office of Director (Works & Services), Sindh Madressatul Islam University, Karachi by furnishing a written request duly appended with a Pay Order / Demand Draft as Tender Fee (non-refundable) amounting to Rs. 5,000/- in favour of Sindh Madressatul Islam University, on any working day during office hours from **Tuesday 24th December, 2019** to **Wednesday 8th January, 2020** and can be download from SPPRA website: <https://ppms.pprasingh.gov.pk/> and SMI- University website: www.smiu.edu.pk
- Sealed Tenders will be received back on **Thursday 9th January, 2020 by 02-00 PM** and will be opened by the Procurement Committee in the presence of the bidders or their authorized representatives who wish to be present, on same day at **02-30 PM** in the **Conference Room No. 02, first floor Main Building, Sindh Madressatul Islam University, Aiwan-e- Tijarat Road Behind HBL Plaza, Karachi.**
- Eligibility Criteria:**
 - Valid registration with Pakistan Engineering Council (PEC) category C-5 or above in the relevant field of specialization of work in ME 01 and EE04.
 - Similar nature projects successfully completed with cumulative cost not less than Rs50 million with work orders and completion certificate issued by respective Clients duly appended with bid proposal.
 - Registration with income tax department (NTN certificates) with active status in Federal Board of Revenue duly appended with bid proposal.
 - Registration certificate of GST and SRB duly appended with bid proposal.
 - Bio Data of Engineering and Technical Staff working with the firm along with attested CVs.

- f. Documentary evidence of work executed / works in progress and certificate of satisfactory completion of works by the employers during at least last three years. List of works should indicate cost of each work and copy of letter of award of work.
 - g. List of machinery, equipment, tools & tackles on permanent inventory of bidder and available.
 - h. An affidavit certificate that the bidder firm has never been black listed by Government/ Semi Government / Autonomous / Private Bodies and that the firm has not been involved in any litigation and arbitration with Government/ Semi Government / Autonomous / Private Bodies.
 - i. In case of partners / partnership deed, giving full particulars of Directors/Proprietors or other connected in the partnership along with the Power of Attorney. In case of being sole proprietorship, such undertaking shall have furnished on affidavit.
 - j. In case of joint ventures, conditions to be fulfilled by any firm.
 - k. Affidavit shall be submitted stating that all documents/ particulars/ information/data furnished with the bid proposal are true and correct.
 - l. The interested bidders must have turnover of at least Rs 75 million for last three years.
- 4- Bid Validity Period: 90 days
 - 5- Earnest Money at the rate of 2% of bid price should be submitted along with Bid Proposal in shape of Call Deposit/Pay order/Demand Draft/Bank Guarantee issued by any scheduled bank of Pakistan in favour of Sindh Madressatul Islam University Karachi.
 - 6- Conditional bid proposals and/or bid proposals **without earnest money** shall not be considered.
 - 7- Bids must be offered on the prescribed bidding documents issued by Sindh Madressatul Islam University or downloaded from SPPRA/SMIU website.
 - 8- If interested firms/bidders download the tender documents from SPPRA or SMIU website, they will have to submit tender fee in the form of a Pay Order / Demand Draft (non-refundable) amounting to Rs. 5,000/- in favour of Sindh Madressatul Islam University along with the bid proposal. If the tender fee is not submitted with bid proposal, it will not be considered by the SMIU Procurement Committee.
 - 9- Procuring Agency reserves the right to reject all or any bids subject to the relevant provisions of SPPRA Rules-2010 amended (2019).
 - 10- In case any unforeseen situation resulting in closure of office on the date of opening or if Government declares Holiday, the tender shall be submitted/opened on the next working day at the same time and venue.

Director (Works & Services)

Bid Data Sheet

The following specific data for the goods to be procured shall complement, supplement, or amend the provisions in the Instructions to Bidders (ITB) Part One. Whenever there is a conflict, the provisions herein shall prevail over those in ITB.

Introduction	
ITB 1.1	Name of Procuring Agency: Sindh Madressatul Islam University, Karachi
ITB 1.1	Sindh Government Grant.
ITB 1.1	Name of Project: Development of SMIU Model School and University Academic Block at SMIU City Campus, Karachi
ITB 1.1	Name of Contract: Supplying, Installation, Testing & Commissioning of VRF System for I.T Block Sindh Madressatul Islam University (SMIU), City Campus, Karachi.
ITB 4.1	Name of Procuring agency. Sindh Madressatul Islam University, Karachi.
ITB 6.1	Procuring Agency's address, telephone, telex, and facsimile numbers: Aiwan-e-Tijarat Road, Behind HBL Plaza, Karachi-74000, Pakistan. Phone 021-99217501-3, Fax. 021-99211274
ITB 8.1	Language of the bid. English

Bid Price and Currency	
ITB 11.2	The Bid Proposal must be quoted in Pak Rupees as per the given BOQ including cost of material, labor, insurances, incidentals, applicable duties & taxes, contractors overheads & profits etc.
ITB 11.5	The price shall be fixed

Preparation and Submission of Bids	
ITB 13.3 (d)	Qualification requirements: As per details in the NIT.
ITB 15.1	Amount of bid security. 2% of bid price in shape of Call Deposit /Pay Order/Demand Draft/Bank Guarantee issued by any scheduled bank of Pakistan in favor of Sindh Madressatul Islam
ITB 16.1	Bid validity period: 90 days from the date of opening of bid.
ITB 17.1	Number of copies: One Original + 1 copy
ITB 18.2 (a)	Address for bid submission: Conference Room No. 02, first floor Main Building, Sindh Madressatul Islam University, Aiwan-e- Tijarat Road Behind HBL Plaza, Karachi.
ITB 18.2 (b)	IFB title and number. SMIU/TEND/2019-2020/12
ITB 19.1	Deadline for bid submission. As per details in the NIT.
ITB 22.1	Time, date, and place for bid opening. As per details in the NIT.

Bid Evaluation	
ITB 25.3	Criteria for bid evaluation. <ol style="list-style-type: none"> 1. Lowest Bid Amount. 2. Prompt delivery Schedule forming part of Bid. 3. Comprehensive assurance from principals for availability of Spare Parts & after Sales Services through their local counterparts. 4. No deviation from prescribed payment schedule.

ITB 25.4 (c) (ii)	Deviation in payment schedule. Not Applicable
ITB 25.4 (d)	Cost of spare parts. <i>As per BOQ</i>
ITB 25.4 (f)	Operating and maintenance costs. <i>Maintenance Cost as per BOQ.</i>
ITB 25.4 (g)	Performance and productivity of equipment. The offered equipment should match with the given specification or an improved performance Data.
ITB 25.4 (h)	Evaluation and selection shall be based on the Specifications, warranties and performance details of the equipment offered.
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Special Conditions of Contract

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract. The corresponding clause number of the GCC is indicated in parentheses.

1. Definitions (GCC Clause 1)

GCC 1.1 (g)—The Procuring agency is: **Sindh Madressatul Islam University (SMIU), Karachi.**

GCC 1.1 (h)—The Procuring agency's country is: **Pakistan.**

GCC 1.1 (i)—The Supplier is:

Sample Provision

GCC 1.1 (j)—The Project Site is: Sindh Madressatul Islam University City Campus, I.T Block, Aiwane-Tijarat Road, Behind HBL Plaza, Karachi-74000,

2. Country of Origin (GCC Clause 3)

Refer details given in Technical Specification Part-1 (1.3) of the bidding documents.

3. Performance Security (GCC Clause 7)

GCC 7.1—The bidder must submit within seven (07) days from the date of notification for award of contract, performance security @10% of the Contract Price in the form of Call Deposit/Pay order/Demand Draft/bank guarantee from any scheduled bank in Pakistan which shall be held and returned after maintenance / warranty period / defect liability period of one year.

On receipt of 10% Performance Security, 2% Bid Security will be refunded.

4. Inspections and Tests (GCC Clause 8)

GCC 8.6—The prescribed equipment will be checked, tested and a Quality Control Certificate will have to issue by the Principal Company stating that complete equipment meets the specifications and the equipment has complied and passed all prescribed tests.

5. Packing (GCC Clause 9)

Same as per GCC 9

6. Delivery and Documents (GCC Clause 10)

GCC 10.3—Upon shipment, the Supplier shall immediately notify the Procuring Agency, full details of the shipment, including Contract number, description of Goods, quantity and usual transport document. The Supplier shall mail the following

documents to the Procuring Agency:

- (i) copies of the Supplier’s invoice showing Goods’ description, quantity, unit price, and total amount;
- (ii) original and two copies of the usual transport document (for example, a negotiable bill of lading, a non-negotiable sea waybill, an inland waterway document, an air waybill, a railway consignment note, a road consignment note, or a multimodal transport document) which the buyer may require to take the goods;
- (iii) copies of the packing list identifying contents of each package;
- (iv) insurance certificate;
- (v) Manufacturer’s or Supplier’s warranty and QA & QC Certificates;
- (vi) Inspection certificate, issued by the nominated inspection agency, and the Supplier’s factory inspection report; and
- (vii) Certificate of origin.

7. Insurance (GCC Clause 11)

GCC 11.1— The insurance of complete equipment during shipment, transportation to site, installation and warranty period shall be the responsibility of the vendor/firm awarded this contract.

8. Incidental Services (GCC Clause 13)

GCC 13.1—Incidental services to be provided are mentioned in GCC clause 13 and the cost of Incidental services are included in the Contract Price.

9. Warranty (GCC Clause 15)

GCC 15.2— The Vendor/Supplier shall provide a comprehensive warranty of the complete equipment including its performance for one years from the date of commissioning of the VRF system and its handing over. Vendor/Supplier will have all performance tests conducted at their own cost and expense to ensure that VRF system performance satisfactorily during one-year post commissioning.

10. Payment (GCC Clause 16)

Payment for Goods supplied:

Payment shall be made in Pak. Rupees promptly by the Procuring Agency within 14 days

after the verification of the Contractor's invoice by the Engineer (Consultant).

11. Prices (GCC Clause 17)

GCC 17.1— Prices charged by the Vendor/Supplier for Goods delivered and Services performed under the Contract shall not vary from the prices quoted in the approved bid.

12. Liquidated Damages (GCC Clause 23)

GCC 23.1—Applicable rate:

If the Vendor/Supplier fail to complete the work within the stipulated time, liquidated damages at the rate of 0.44% per day of the value of contract shall be recovered from Supplier subject to the maximum of 10% (ten percent) of the agreed bid/contract price.

13. Resolution of Disputes (GCC Clause 28)

GCC 28.3—The dispute resolution mechanism to be applied pursuant to GCC Clause 28.2 shall be as follows:

In the case of a dispute between the Engineer and the Vendor/Supplier, the dispute shall be referred to the Vice Chancellor **Sindh Madressatul Islam University (SMIU)** for adjudication or arbitration and the decision of the Vice Chancellor shall be binding for the Vendor/Supplier.

14. Governing Language (GCC Clause 29)

GCC 29.1—The Governing Language shall be: **English**

15. Applicable Law (GCC Clause 30)

GCC 30.1-The Contract shall be interpreted in accordance with the laws of Islamic Republic of Pakistan which includes the following legislation:

The Employment of Children (ECA) Act 1991
The Bonded Labour System (Abolition) Act of 1992
The Factories Act 1934

16. Notices (GCC Clause 31)

GCC 31.1—Procuring Agency's address for notice purposes:

Directorate of Works and Services SMIU, Aiwan-e- Tijarat Road Behind HBL Plaza, Karachi.

Supplier's address for notice purposes: _____

17. Co-Operation With Other Contractors

During the execution of the work, The Contractor shall fully co-operate with existing contractors working for the Procuring Agency at and in vicinity of site and also shall provide adequate precautionary facilities not to make himself a nuisance to local residents and other contractors.

Contractor will be jointly responsible along with M/s. Canny Engineers and Developers (Contractor) for testing and commissioning of VRF System.

Schedule of Requirements

The delivery schedule expressed as weeks/months stipulates hereafter a delivery date which is the date of delivery required.

Number	Description	Quantity	Delivery schedule (shipment) in weeks/months from_____ ¹
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**Time Limit / Completion Period is same as mentioned in NIT
i.e. 03 Months**

**Technical Specifications is enclosed as Volume-II to this
document**

Sample Forms

1. *BID FORM AND PRICE SCHEDULES*.....
2. *BID SECURITY FORM*.....
3. *CONTRACT FORM*.....
4. *PERFORMANCE SECURITY FORM*.....
5. *BANK GUARANTEE FOR ADVANCE PAYMENT*.....
6. *MANUFACTURER'S AUTHORIZATION FORM*.....

1. Bid Form and Price Schedules

Date: _____
IFB N^o: _____

To: [name and address of Procuring Agency]

Gentlemen and/or Ladies:

Having examined the bidding documents including Addenda Nos. [insert numbers], the receipt of which is hereby duly acknowledged, we, the undersigned, offer to supply and deliver [description of goods and services] in conformity with the said bidding documents for the sum of [total bid amount in words and figures] or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted, to deliver the goods in accordance with the delivery schedule specified in the Schedule of Requirements.

If our Bid is accepted, we will obtain the guarantee of a bank in a sum equivalent to 10% percent of the Contract Price for the due performance of the Contract, in the form prescribed by the Procuring agency.

We agree to abide by this Bid for a period of [number] days from the date fixed for Bid opening under Clause 22 of the Instructions to Bidders, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal Contract is prepared and executed, this Bid, together with your written acceptance thereof and your notification of award, shall constitute a binding Contract between us.

Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below:

Name and address of agent	Amount and Currency	Purpose of Commission or gratuity
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if none, state "none")

We understand that you are not bound to accept the lowest or any bid you may receive.

Dated this _____ day of _____ 19 _____.

[signature]

[in the capacity of]

Duly authorized to sign Bid for and on behalf of _____

**Price Schedule in Pak. Rupees is enclosed as Volume-III to this
Document.**

2. Bid Security Form

Whereas *[name of the Bidder]* (hereinafter called “the Bidder”) has submitted its bid dated *[date of submission of bid]* for the supply of *[name and/or description of the goods]* (hereinafter called “the Bid”).

KNOW ALL PEOPLE by these presents that WE *[name of bank]* of *[name of country]*, having our registered office at *[address of bank]* (hereinafter called “the Bank”), are bound unto *[name of Procuring agency]* (hereinafter called “the Procuring agency”) in the sum of for which payment well and truly to be made to the said Procuring agency, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this _____ day of _____ 19_

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or
2. If the Bidder, having been notified of the acceptance of its Bid by the Procuring agency during the period of bid validity:
 - (a) fails or refuses to execute the Contract Form, if required; or
 - (b) fails or refuses to furnish the performance security, in accordance with the Instructions to Bidders;

we undertake to pay to the Procuring agency up to the above amount upon receipt of its first written demand, without the Procuring agency having to substantiate its demand, provided that in its demand the Procuring agency will note that the amount claimed by it is due to it, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including twenty eight (28) days after the period of bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

[signature of the bank]

3. Contract Form

THIS AGREEMENT made the _____ day of _____ 19____ between [name of Procuring Agency] of [country of Procuring agency] (hereinafter called “the Procuring agency”) of the one part and [name of Supplier] of [city and country of Supplier] (hereinafter called “the Supplier”) of the other part:

WHEREAS the Procuring agency invited bids for certain goods and ancillary services, viz., [brief description of goods and services] and has accepted a bid by the Supplier for the supply of those goods and services in the sum of [contract price in words and figures] (hereinafter called “the Contract Price”).

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:
 - (a) the Bid Form and the Price Schedule submitted by the Bidder;
 - (b) the Schedule of Requirements;
 - (c) the Technical Specifications;
 - (d) the General Conditions of Contract;
 - (e) the Special Conditions of Contract; and
 - (f) the Procuring agency’s Notification of Award.
3. In consideration of the payments to be made by the Procuring agency to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Procuring agency to provide the goods and services and to remedy defects therein in conformity in all respects with the provisions of the Contract
4. The Procuring agency hereby covenants to pay the Supplier in consideration of the provision of the goods and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the contract at the times and in the manner prescribed by the contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, sealed, delivered by _____ the _____ (for the Procuring agency)

Signed, sealed, delivered by _____ the _____ (for the Supplier)

4. Performance Security Form

To: *[name of Procuring agency]*

WHEREAS *[name of Supplier]* (hereinafter called “the Supplier”) has undertaken, in pursuance of Contract No. *[reference number of the contract]* dated _____ 19____ to supply *[description of goods and services]* (hereinafter called “the Contract”).

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier shall furnish you with a bank guarantee by a reputable bank for the sum specified therein as security for compliance with the Supplier’s performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Supplier a guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of *[amount of the guarantee in words and figures]*, and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract and without cavil or argument, any sum or sums within the limits of *[amount of guarantee]* as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the _____ day of _____ 19.

Signature and seal of the Guarantors

[name of bank or financial institution]

[address]

[date]

5. Bank Guarantee for Advance Payment

To: *[name of Procuring agency]*

[name of Contract]

Gentlemen and/or Ladies:

In accordance with the payment provision included in the Special Conditions of Contract, which amends Clause 16 of the General Conditions of Contract to provide for advance payment, *[name and address of Supplier]* (hereinafter called “the Supplier”) shall deposit with the Procuring agency a bank guarantee to guarantee its proper and faithful performance under the said Clause of the Contract in an amount of *[amount of guarantee in figures and words]*.

We, the *[bank or financial institution]*, as instructed by the Supplier, agree unconditionally and irrevocably to guarantee as primary obligator and not as surety merely, the payment to the Procuring agency on its first demand without whatsoever right of objection on our part and without its first claim to the Supplier, for the amount not exceeding *[amount of guarantee in figures and words]*.

We further agree that no change or addition to or other modification of the terms of the Contract to be performed thereunder or of any of the Contract documents which may be made between the Procuring agency and the Supplier, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition, or modification.

This guarantee shall remain valid and in full effect from the date of the advance payment received by the Supplier under the Contract until *[date]*.

Yours truly,

Signature and seal of the Guarantors

[name of bank or financial institution]

[address]

[date]

6. **Manufacturer's Authorization Form**

[See Clause 13.3 (a) of the Instructions to Bidders.]

To: *[name of the Procuring agency]*

WHEREAS *[name of the Manufacturer]* who are established and reputable manufacturers of *[name and/or description of the goods]* having factories at *[address of factory]*

do hereby authorize *[name and address of Agent]* to submit a bid, and subsequently negotiate and sign the Contract with you against IFB No. *[reference of the Invitation to Bid]* for the above goods manufactured by us.

We hereby extend our full guarantee and warranty as per Clause 15 of the General Conditions of Contract for the goods offered for supply by the above firm against this Invitation for Bids.

[signature for and on behalf of Manufacturer]

Note: This letter of authority should be on the letterhead of the Manufacturer and should be signed by a person competent and having the power of attorney to bind the Manufacturer. It should be included by the Bidder in its bid.

(INTEGRITY PACT)
DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC.
PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN CONTRACTS

Contract No. _____

Dated: _____

Contract Value: _____

Contract Title:

M/s. _____ hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Sindh (GoS) or any administrative subdivision or agency thereof or any other entity owned or controlled by GoS through any corrupt business practice.

Without limiting the generality of the foregoing, **M/s** _____ represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoS, except that which has been expressly declared pursuant hereto.

M/s _____ certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GoS and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

M/s _____ accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to GoS under any law, contract or other instrument, be voidable at the option of GoS.

Notwithstanding any rights and remedies exercised by GoS in this regard, **M/s** _____ agrees to indemnify GoS for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoS in an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by **M/s** _____ as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoS.

Name of Client:

Name of Contractor/Supplier:

Signature:

Signature:

[Seal]

[Seal]

Designation:

Designation:

TECHNICAL SPECIFICATIONS

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1.0 VARIABLE REFRIGERANT FLOW (VRF) SYSTEM AIR CONDITIONERS:**1.1 GENERAL:**

Provide a complete air cooled, multiple evaporators, direct expansion heating and cooling system. The system shall consist of multiple evaporators using PID control the outdoor unit shall be a direct expansion (DX), air-cooled, multi zone split system, using R410A or any other green gas refrigerant. All indoor units shall be capable of operating separately with individual temperature control.

The outdoor units shall be interconnected to the indoor units in accordance with the manufacturer's engineering data detailing each available indoor unit. The SEER of the machine shall be 6.3 or higher. The indoor units shall be connected to the outdoor utilizing the manufacturer's specified piping joints and headers.

1.2 OUTDOOR UNITS:

1.2.1 General:

The outdoor unit shall be designed specifically for use with all other series components.

- A. The outdoor unit shall be factory assembled and pre-wired with all necessary electronic and refrigerant controls. The refrigeration circuit of the condensing unit shall consist of a compressor, motors, fans, condenser coil, electronic expansion valve, solenoid valves, 4 way valve, distribution headers, capillaries, filters, shut off valves, oil separators, service parts, liquid receivers and accumulators.
- B. Both liquid and suction lines must be individually insulated between the outdoor and indoor units
- C. The outdoor unit can be wired and piped with indoor unit access from left, right or rear.
- D. The sound pressure dB (A) at rated conditions shall be a value of 58 decibels at 3 feet from the front of the unit.
- E. The system will automatically restart operation after a power failure and will not cause any settings to be lost, thus eliminating the need for re-programming.
- F. The outdoor unit shall be modular in design and should allow for a side-by-side installation with minimum spacing.
- G. The following safety devices shall be included on the condensing unit: high pressure switch, control circuit fuses, crankcase heaters, fusible plug,

high pressure switch, overload relay, thermal protectors for compressor and fan motors, over current protection. To ensure the liquid refrigerant does not flash when supplying to the various fan coil units, the circuit shall be provided with a sub-cooling feature. Oil recovery cycle shall be automatic.

- H. The ambient dry bulb temperature shall be 115 °F. However the outdoor Condenser unit shall continue to operate at 125 °F ambient temperature without additional low ambient controls. This parameter must be taken into consideration during selection purpose.

1.2.2 Condenser Coil:

- A. The condenser coil shall be manufactured from copper tubes expanded into aluminum fins to form a mechanical bond.
- B. The coil shall be of a waffle louver fin and high heat exchanger, rifled bore tube design to ensure highly efficient performance.
- C. The coils shall be complete with corrosion treatment of an acrylic resin type. The thickness of the coating must be between 2.0 to 3.0 microns.
- D. Coils shall be tested in accordance with ANSI/ASHRAE 15 & 34 at the factory and be suitable for the working pressure of the installed system.

1.2.3 Compressor:

- A. The compressor shall be Inverter Based technology to vary total cooling load as determined by the suction gas pressure as measured in the condensing unit.
- B. The compressor in each condensing unit shall be of highly efficient reluctance DC, hermetically sealed scroll.
- C. Each compressor shall be equipped with a crankcase heater, high pressure safety switch, and internal thermal overload protector.
- D. Oil separator shall be standard with equipment together with an oil balancing circuit.
- E. The compressor shall be mounted to avoid the transmission of vibration.
- F. The control wiring shall be a two-wire multiplex transmission system, making it possible to connect multiple indoor units to one outdoor unit with 2-cable wire, thus simplifying the wiring operation.
- G. Spare compressor shall be provided with the system

1.3 INDOOR UNITS:

1.3.1 Cabinet, Casing and Frame:

Unit framework to be formed of structural steel members of 12 to 14 gauge mild steel. After assembly paint the framework for maximum protection against rust. Exterior panels to be fabricated of 18 gauge galvanized steel finished with baked acrylic enamel over an epoxy primer. Provide isolation valves and neoprene gasketing between panels and frame members; panels to be attached to the frame with quick release latch (no sheet metal screws). Insulate sections including compressor compartment with 1" thick, 3-lb./cu. ft. density fiberglass having an R value of 4.16.

Arrange units for full front, side and rear service access to all mechanical, electrical and refrigeration controls, check out of electrical control panel, without disrupting or interfering with air flow.

1.3.2 Supply Fan and Motor:

Provide single width, forward curved Class I & II supply fans secured to a machined, ground and polished solid steel shaft. Coat shaft with a rust inhibitor and support by two outboard bearings selected for a minimum 200,000 hours average life.

Provide three-phase NEMA design 'B', 40qC continuously rated fan motor with energy-saving design, .85 power factor, NEMA 'T' frame, open drip-proof, operating at 1750 rpm and supplied with grease-lubricated ball bearings.

1.3.3 Direct Expansion Coil:

Provide direct expansion coil with ½" OD seamless copper tubes expanded into aluminum fins, not less than 3 rows deep or more than 12 fins per inch. Provide evaporator coil with a distributor with side port for hot gas bypass and thermostatic expansion valve with adjustable superheat and external equalizer. Test coil at 300 PSIG air pressure under water, completely dehydrate and pressure test with refrigerant.

Provide coils with heavy gauge, insulated, galvanized steel drain pans complete with mastic coating for corrosion protection.

1.3.4 Filters:

Provide filters having a 40% ASHRAE dust spot efficiency, U.L. Class I pleated media type 2-inch deep.

1.3.5 Evaporator Defrost Thermostat:

Provide defrost thermostat package with enclosure, wiring and hardware for field installation.

1.4 APPROVED MAKES:

The unit shall be provided as per List of Approved Manufacturer's.

1.5 INSTALLATION:

The Contractor shall be responsible for installation of VRF System as shown on the construction drawings and documents, complete in all respects, to the satisfaction of the Client / Engineer In charge. All pipe connections, electrical connections, drain connections, etc. shall also be done by the Contractor, complete in all respects.

The installation shall be carried out per recommendations of VRF System Manufacturer and as specified herein. For installation the Contractor must ensure that all VRF System equipment must be installed by factory trained and authorized personnel of VRF System Manufacturer. After installation of equipment Manufacturer representative must provide a certificate stating that all the installation is done to his satisfaction and as per Manufacturer's Recommendation.

1.6 COMMISSIONING AND TESTING:

The VRF System shall be commissioned and tested as per the Manufacturer's recommendations and by factory trained and authorized personnel of VRF System Manufacturer. Commissioning and Testing reports duly verified by Manufacturer's Representative must provided after complete Commissioning and Testing process. During Commissioning and Testing, the Drives shall be adjusted to provide the required airflow rate and valves shall be adjusted for the proper refrigerant flows, etc. Control start-up and commissioning shall also be covered during Commissioning and Testing procedure.

2.0 ELECTRICAL WORKS:

2.1 Electrical Wiring:

The Contractor shall be responsible for the complete power and control electric wiring of the required for VRF air-conditioning system. The Owner shall provide a 3 phase and neutral 4 wire electric supply at points indicated on the drawings. Wiring onwards from this supply point to all motors, controls, etc., shall be the responsibility of the air-conditioning contractor.

The electrification work shall be carried out by a licensed workman, authorized to undertake such a work under the provision of Pakistan Electricity Act and Rules and the latest edition of I.E.E. Wiring Regulations.

Any special requirements of the local Electric Supply Company shall be complied with.

2.2 Cables:

All the cables listed, except otherwise specified, are four cores PVC insulated PVC sheathed cables 600/1000 volts grade as per British Standard B.S. 6004:1969. The conductors shall be of high conductivity annealed copper wires of 99.97% purity heavily insulate with PVC compound and sheathed overall with PVC compound. The insulation color identification will be as red, yellow, blue and black for neutral. In general all the cables, except otherwise specified in the cable schedule will be non-armored types. All cables shall be selected at 45°C.

2.3 Electric Motors:

The electric motors shall be of the type and sizes required for driving all air-conditioning equipment and should comply with the rules of Electrical Machines as stated in the VDE0530 and the BS 2613 : 1957 specifications. The motors offered should have output rating as specified and should meet the system requirements.

Adjustments on motor horsepower or speed will be allowed on this account. Generally all motors shall be constant speed, three phase squirrel cage induction type, unless otherwise specifically noted.

The motors offered should be designed and rated for 400V, 3 phase, 50 cycles A.C. system and should be able to give their rated output at + 5% the rated voltage and frequency.

The motors shall be suitable and be able to give required output under site conditions i.e. maximum ambient temperature of 120°F and altitude 1000 meters. The motor where specified as of single phase should be suitable for operation on 230 + 5% volts, 50 cycles A.C. system.

The motor shall be tropicalized class 'F' insulation and fungus proof. Unless otherwise specified the motors shall have drip proof construction for indoor installation and totally enclosed weatherproof; fan cooled construction for outdoor installation.

All motors shall be arranged for quiet operation and guaranteed to give the required output and fulfill the requirements of the machinery without producing any sound audible outside the machine room.

2.4 Motor Control Centre Construction and Components:

- (a) General: The central control panel shall be located as indicated in drawings. It shall be floor-mounted, free standing and front access design.

Each piece of equipment on the part shall be identified by a nameplate.

Nameplate may be plastic or metal and attached to the surface of the panel or integral with it.

Painting or lettering, directly on the panel will not be permitted. Control instruments, wiring and terminals shall be within the panel, except that switches pilot lights, and push buttons shall be mounted on the panel front. The front panel shall be hinged for front access. The Motor control centres shall be from Standard manufacturers and shall be provided as per List of Approved Manufacturer's or equivalent make subject to the approval of Consultant.

- (b) Construction: The control centre shall be consisted of 90 inches high and approximately 12-18 inches deep. The external panels shall be of flanged 14-gauge sheet steel. Side, top, back and full floor plates shall be rigidly joined by cross members and angle iron brackets.

Removable floor channels 1.5" x 3" shall be provided to support and mount the entire control centre.

- (c) Unit Compartments: provide each compartment with an individual front door.

- (d) Bus: Power shall be distributed horizontally within the control centre by a three phase electrolytic copper bus (99.7% purity), rated for the required Amperes continuous current and braced for minimum 40,000 ampere RMS asymmetrical short circuit current or as indicated on drawings. The bus shall be efficiently isolated from all wiring troughs and other working areas. Power within vertical sections shall be distributed by vertical copper bus bars. Bus bars shall be painted red, yellow and blue.

All the bus bars, internal wiring cables and other equipment shall be rated for 45°C ambient and bus bar end temperature of 65°C.

Provide copper ground bus of the required amperage but having not less than 200 amperes capacity in the base of the control centre permanently grounding the structure. Provide lugs as required for ground wire attachment.

- (e) Incoming & Outgoing Cable Termination: Provide 12" or more of wiring space just below the main bus for incoming cable. Provide space for outgoing cables through either top or bottom of all standard vertical sections.
- (f) Main Protective Device: The incoming line protection device unless otherwise specified shall be a circuit breaker of the frame size and ampere rating required for the power supply to the plant.
- (g) Motor Starters: All starters for single phased motors shall be automatic magnet direct-on-line types with adjustable overload cutout start/reset push button. Where electrical interlocking is required the starters shall be additionally provided with hand/off/auto switch and at least two auxiliary contacts for electric or electronic interlocking or as specified.

All three phase motor starters up to 10 HP shall be automatic magnetic direct-on-line type, with three adjustable overload cutouts, Ammeter low voltage cutout, single phasing preventer, stop-reset push button, HAND-OFF-AUTO switch and at least one auxiliary contact for electrical interlocking circuit or as specified.

The squirrel cage induction motors 15 HP and above shall have star-delta type reduced voltage starters. The automatic starter shall have hand/off/auto switch, wherever electrical interlocking is required or where shown on the drawings. All starters should have three adjustable overload cutouts, Ammeter low voltage cutout, single phasing preventer, stop-reset push button, at least two auxiliary contacts for electrical interlocking circuit.

All starters control circuit and magnetic coils to be suitable for 230 volt, 1 phase A.C. For motors requiring electrical interlocking or remote control or sequence starting control or any other such feature, starters should

have necessary auxiliary contacts providing the desired control arrangement.

A separate set of terminals is required for each control circuit. All motors and starters provided under this contract should be of one manufacturer except for the equipment where special motors and starters are provided as standard components.

- (h) Unit Nameplate: Each unit shall be identified by a ½" x 4" engraved nameplate.
- (i) Motor Protection: Furnish and install all starters, overload heaters, as well as fuses unless specifically noted otherwise on the drawings. The selection of the overload heaters shall be based on the motor nameplate data. Fuses shall be of the dual element type, unless specifically noted otherwise. They shall be properly coordinated and in general sized according to fuse manufacturer's recommendations for the loads served.
- (j) Air Break Contractors: The contractors shall be suitably rated according to the motor output rating if not specified in the drawings and having rupturing capacity of 25 kA. Backup fuses to be provided if rupturing capacity is lower than the required.

The contractors should have sturdy magnets and bearings and should have bouncing, easily replaceable contacts of silver alloy and long contact life.

- (k) Time Relays: Time relays used in Automatic star-delta starter can be motor driven or electronic type but should have a high timing accuracy independent of voltage and temperature fluctuations.

The relays should generally have operating time range between 0.5 to 20 seconds. However in cases of motors having longer starting periods the Contractor will check their starting time and use matched time relays accordingly.

- (l) Selector Switches, Pilot Lamps, Relays, etc.: In general, where motors are to be automatically controlled a "HAND-OFF-AUTO" selector switch shall be provided and mounted in the enclosure cover. Selector switches shall be equipped with Voltmeter and Ammeter. Provide motors that are to be started manually with "START-STOP" buttons mounted in the enclosure cover.

For all motors installed in the plant room, pilot lights, for ON-OFF-OVERLOAD status indication shall be provided on this panel, or specifically as shown on drawings.

Necessary relays etc. for interlocking starters, LEAD-LAG Switch, etc., shall also be provided.

The overload relays shall be of the soldered ratchet type.

Starters used on 400 volts circuits shall have a 230 volt step-down control transformer included in the enclosure of 350 volt amperes.

Provide each starter with a blank plastic nameplate with the equipment identification marked thereon.

2.5 Motor Control Centre Configuration:

Motor control centres shall have the configuration as shown on the drawings.

2.6 INSTALLATION:

2.6.1 General: The Contractor shall be responsible for the complete power and control electric wiring of VRF air-conditioning system. The Owner shall provide a 3 phase and neutral, 4 wire electric supply points with earthing continuity conductors where indicated on the drawings. Wiring onwards from this supply point to all motors, controls, etc., shall be the responsibility of the VRF contractor. The remote motor/ equipment control from the MCC shall be provided with a Disconnecting switch near the equipment.

2.6.2 Electric Wiring & Earthing: The electrification work shall be carried out by a Licensed Electrician, authorized to undertake such work under the provision of Pakistan Electricity Act & Rules. The installation shall be carried out in conformity with Pakistan Electricity Act & Rules and the latest edition of I.E.E. Wiring Regulations. Any special requirements of the local Electricity Supply Company shall be complied with.

All power and control wiring shall be duly tagged/ numbered on circuit for the ease of trouble shooting on wiring diagram and on circuits in MCC. All wiring in Plant Room shall be run in approval rigid and flexible steel conduits from the MCC to the motors, on the surface of walls, roofs & columns. Galvanized steel saddle and clamps of minimum 16 SWG, approved by the Consultants, shall be fixed to the surface using nylon plugs and galvanized steel screw, with a maximum distance of 3 ft. between clamps. Pull boxes, having sized of 4' x 4" & 2" deep and constructed of 18 SWG sheet steel shall be installed wherever required to limit the pulling length and shall be in a flexible steel conduit, provided with suitable bras glands and check nuts.

Earthing continuity conductors shall be hard drawn base electrolytic copper wires of the recommended size for the motor being served and shall be run along the cables. Earthing to each motor of 1 HP and above shall be with 2 conductors. The minimum size for the earthing shall be 10 SWG.

2.6.3 Testing:

(a) General: Upon completion of installation and carrying out physical inspection of works, the Contractor shall perform field tests on all

equipment and material before commissioning. All tests shall be performed in the presence of the Consultant's representative for the purpose of demonstrating the equipment or system compliance with specifications, and that each component shall electrically and mechanically function properly as intended. In general the tests shall be carried out in accordance with Section 'E' of Regulations for the Electrical Equipment of Buildings. The Contractor shall however insure that the requirements of the Local Electrical Inspector are met with, and the installation is duly approved by the Electrical Inspector. Proper regards to manufacturer's instructions for testing procedures shall be given for equipment.

The Contractor shall furnish, install and maintain all tools, instruments, test equipment, material, etc., including all personnel required for carrying out the setting, adjustment and recording associated with the testing procedures. All tests shall be made with due consideration to the protection of installation and personnel carrying out the tests. Adequately qualified and trained staff shall supervise the tests. The procedure and sequence of testing shall be furnished to the Consultant at least 48 hours before starting of tests. The Contractor shall systematically keep a record of results of all tests carried out. Two copies of all test data and complied results duly labelling by Engineer In charge/Authorized Representative present during the tests shall be supplied to the Consultant for record purposes and approval obtained.

- (b) Insulation Resistance Test: Insulation Resistance tests shall be carried out on all electrical equipment and wiring, using a self-contained instrument such as direct indicating Ohmmeter of generator type. Only direct current potential shall be used for such testing; voltage range for the same are as under:

Circuits up to 250 volts: 500 volts D.C.

Circuits above 250 volts
and up to 500 volts: 1000 volts D.C.

All cables before connection at switchgear of equipment shall be tested for insulation resistance. The test shall be carried out individually between each cable in circuit and also between cable and earth. The minimum acceptable value of insulation resistance shall be 1 Mega ohm.

Before making any connection all switchgear shall be tested for insulation resistance between live parts and earth. Insulation tests on circuit breakers between each phase and earth. The minimum acceptable value of insulation shall be 5 Meg. Ohms. If the Insulation resistance of any circuit or equipment under test is less than the specified values, the cause of low reading shall be determined and necessary corrective measures carried out. Tests shall be repeated after rectification of defective section for ensuring correct value of insulation resistance before commissioning.

- (c) Operational Tests:
All equipment power feeders shall be tested for operation under load conditions.

Each switch shall be carried to ensure that the operating mechanisms are working. Nameplates are also to be checked for proper designation with respect to the equipment connected. The Contractor shall identify the phases of incoming supply and all equipment, to ascertain that each circuit is connected in proper phase sequence. Wherever required phase identification markings or labelling shall be provided on switchgear and cables. Motors must be tested for proper rotation and stroboscopic effect.

3.0 LIST OF APPROVED MANUFACTURERS:

S.NO.	EQUIPMENT / MATERIAL	RECOMMENDED MANUFACTURERS
1	VARIABLE REFRIGERANT FLOW (VRF) SPLIT SYSTEM AIR-CONDITIONER (HIGH COP)	a) HAIER b) GREE c) HISENSE d) LG e) TCL
2	ELECTRIC CABLES	a) PAKISTAN CABLES b) NEW AGE CABLES c) POINEER CABLES
3	COPPER PIPING	a) MUELLER, USA b) YORKSHIRE, UK c) TROX, KOREA
4	UPVC PIPING	a) DADEX b) JEDDAH POLYMER c) VESBO
5	PVC CONDUIT FOR HVAC ELECTRICAL WORKS (POWER, CONTROL & COMMUNICATION WIRING – CONCEALED / RECESSED APPLICATION) GI CONDUIT FOR HVAC ELECTRICAL WORKS (POWER, CONTROL & COMMUNICATION WIRING – SURFACED / EXPOSED / ABOVE FALSE CEILING	a) HILAL, PAKISTAN b) DADEX, PAKISTAN c) IIL, PAKISTAN d) PLASCO PIPES, PAKISTAN e) POPULAR, PAKISTAN
6	CLOSED CELL FOAM INSULATION	a) AEROFLEX b) AEROFOAM c) ARMACELL
7	HANGERS & SUPPORTS	a) HILTI, GERMANY b) FISHER, GERMANY c) SIKLA, UK d) MUNGO, SWITZERLAND
8	MOTOR CONTROL CENTRE	a) TAJ ENGINEERING b) ENGINEERING & ENGINEERING c) HUSSAIN & CO. d) BILAL ENGINEERING

SUMMARY

S. NO.	DESCRIPTION	TOTAL AMOUNT IN PAK RUPEES
A. SCHEDULE ITEMS		
1	HVAC Works	
		SUB-TOTAL-A Rs.
	Add ___% Above/Below/At par on Plumbing Works of Composite Schedule of Rates 2012, GOVT. OF SINDH	
		TOTAL-A Rs.
B. (NON-SCHEDULE ITEMS)		
1	VARIABLE REFRIGERANT FLOW TYPE UNIT	
2	CONDENSATE PIPING	
3	MOTOR CONTROL CENTRE	
		SUB-TOTAL-B Rs.
		GRAND TOTAL (A+B)

BILL OF QUANTITIES

S.No	GOVT. OF SINDH CSR 2012 Item #/Page#/ Vol.sched ref.	DESCRIPTION	QTY	UNIT	RATE (Rs.)	AMOUNT (Rs.)
1	2	3	4	5	6	7=(4X6)
A SCHEDULE ITEMS						
AMOUNT CARRIED TO HVAC SUMMARY						

S.No	GOVT. OF SINDH CSR 2012	DESCRIPTION	QTY	UNIT	RATE (Rs.)	AMOUNT (Rs.)
	Item #/Page#/ Vol.sched ref.					
1	2	3	4	5	6	7=(4X6)
B NON-SCHEDULE ITEMS						
1		VARIABLE REFRIGERANT FLOW TYPE UNIT Supply, Installation, testing, balancing & commissioning of variable refrigerant flow system, Decorative, Ceiling Concealed ducted type indoor and condensing unit, as shown on the drawings, as specified in equipment schedule and as technical specifications including thermostat, Y-joints and accessories and to the satisfaction of Engineer incharge.				
		GROUND FLOOR				
i		DX-01 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
ii		DX-02 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
iii		DX-03 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
iv		DX-04 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		
v		DX-05 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		
vi		DX-06 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		
vii		DX-07 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		
viii		DX-08 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
ix		DX-09 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
x		DX-10 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
xi		DX-11 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
xii		DX-12 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
xiii		DX-13 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
xiv		DX-14 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		
xv		DX-15 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		
xvi		DX-16 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		

S.No	GOVT. OF SINDH CSR 2012	DESCRIPTION	QTY	UNIT	RATE (Rs.)	AMOUNT (Rs.)
	Item #/Page#/ Vol.sched ref.					
1	2	3	4	5	6	7=(4X6)
xvii		DX-17 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		
xviii		DX-18 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
xix		DX-19&20 (0.75 TR Capacity Decorative Type Wall Mounted)	2	No.		
xx		DX-21&22 (2.0 TR Capacity Decorative Type Wall Mounted)	2	No.		
FIRST FLOOR						
i		DX-01 to 09 (1.0 TR Capacity Decorative Type Wall Mounted)	9	No.		
ii		DX-10 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
iii		DX-11 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
iv		DX-12 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
v		DX-13 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		
vi		DX-14 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
SECOND FLOOR						
i		DX-01 to 04 (1.5 TR Capacity Decorative Type Wall Mounted)	4	No.		
ii		DX-05 to 08 (1.5 TR Capacity Decorative Type Wall Mounted)	4	No.		
iii		DX-09 to 12 (1.5 TR Capacity Decorative Type Wall Mounted)	4	No.		
iv		DX-13 to 16 (1.5 TR Capacity Decorative Type Wall Mounted)	4	No.		
v		DX-17 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
THIRD FLOOR						
i		DX-01 to 04 (1.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
ii		DX-05 to 08 (1.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
iii		DX-09 to 12 (1.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
iv		DX-13 to 16 (1.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
v		DX-17 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		

S.No	GOVT. OF SINDH CSR 2012	DESCRIPTION	QTY	UNIT	RATE (Rs.)	AMOUNT (Rs.)
	Item #/Page#/ Vol.sched ref.					
1	2	3	4	5	6	7=(4X6)
vi		DX-18 (1.5 TR Capacity Decorative Type Wall Mounted)	1	No.		
vii		DX-19 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
viii		DX-20 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
ix		DX-21 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
FOURTH FLOOR						
i		DX-01 to 04 (2.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
ii		DX-05 to 08 (2.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
iii		DX-09 to 12 (2.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
iv		DX-13 to 16 (2.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
v		DX-17 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
FIFTH FLOOR						
i		DX-01 to 04 (2.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
ii		DX-05 to 08 (2.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
iii		DX-09 to 12 (2.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
iv		DX-13 to 16 (2.0 TR Capacity Decorative Type Wall Mounted)	4	No.		
v		DX-17 (0.75 TR Capacity Decorative Type Wall Mounted)	1	No.		
SIXTH FLOOR						
i		DX-01 to 06 (3.0 TR Capacity 4-way Cassette type)	6	Nos.		
ii		DX-07 to 09 (2.5 TR Capacity 4-way Cassette type)	3	Nos.		
iii		DX-10 & 11 (1.0 TR Capacity 4-way Cassette type)	2	Nos.		
iv		DX-12 & 13 (3.0 TR Capacity 4-way Cassette type)	2	Nos.		
v		DX-14 (1.0 TR Capacity Decorative Type Wall Mounted)	1	No.		
Continued						

S.No	GOVT. OF SINDH CSR 2012	DESCRIPTION	QTY	UNIT	RATE (Rs.)	AMOUNT (Rs.)
	Item #/Page#/ Vol.sched ref.					
1	2	3	4	5	6	7=(4X6)
		ROOF				
i		CONDENSING UNIT (CU-01) 21 TR Capacity	1	No.		
ii		CONDENSING UNIT (CU-02) 38 TR Capacity	1	No.		
iii		CONDENSING UNIT (CU-03) 21 TR Capacity	1	No.		
iv		CONDENSING UNIT (CU-04) 33 TR Capacity	1	No.		
v		CONDENSING UNIT (CU-05) 33 TR Capacity	1	No.		
vi		CONDENSING UNIT (CU-06) 35 TR Capacity	1	No.		
AMOUNT CARRIED TO HVAC SUMMARY						

S.No	GOVT. OF SINDH CSR 2012	DESCRIPTION	QTY	UNIT	RATE (Rs.)	AMOUNT (Rs.)
	Item #/Page#/ Vol.sched ref.					
1	2	3	4	5	6	7=(4X6)
2		<p>CONDENSATE PIPING Providing and fixing, uPVC Class 'E' pipes and fittings as per BS 3505 (EN 1401) for Condenser Water drainage including fittings, bends, cuttings, filling etc. as indicated on drawings, as per specifications and Engineers approval.</p>				
i		1" dia	150	Rft		
ii		1 1/4" dia	40	Rft		
iii		1 1/2" dia	40	Rft		
AMOUNT CARRIED TO HVAC SUMMARY						

S.No	GOVT. OF SINDH CSR 2012	DESCRIPTION	QTY	UNIT	RATE (Rs.)	AMOUNT (Rs.)
	Item #/Page#/ Vol.sched ref.					
1	2	3	4	5	6	7=(4X6)
3		<p>Motor Control Centre Supply, installation, testing & commissioning of Wall/Flush mounted Motor Control Centre(MCC), made with 16 SWG sheet steel metal, as per single line diagram, dust protected, vermin proof housing coated with approved color having all the necessary switching & protections, including all mounting accessories as per specifications and drawings, complete in all respect.</p>				
i		MCC-01	1	Nos		
ii		MCC-02	1	Nos		
iii		MCC-03	1	Nos		
iv		MCC-04	1	Nos		
v		MCC-05	1	Nos		
vi		MCC-06	1	Nos		
		Providing & laying PVC insulated with size 3-7/.044 copper conductor in 25mm dia PVC conduit recessed / surface in the wall or column as required.	5350	Rft		
AMOUNT CARRIED TO HVAC SUMMARY						

TENDER DRAWINGS

DEVELOPMENT OF SMIU CAMPUS KARACHI



CONSTRUCTION DRAWINGS
HVAC

IT BLOCK City Campus
OCTOBER, 2019

LIST OF HVAC DRAWING SMIU IT BLOCK

S.#	DRAWING NO.	DRAWING TITLE
1	EA-00986-SIT-M0-01	LIST OF HVAC DRAWINGS
2	EA-00986-SIT-M0-02	HVAC GENERAL NOTES, LEGENDS & ABBREVIATIONS
3	EA-00986-SIT-M0-03	HVAC STANDARD DETAILS
4	EA-00986-SIT-M1-01	-
5	EA-00986-SIT-M1-02	GROUND FLOOR - HVAC LAYOUT
7	EA-00986-SIT-M1-03	FIRST FLOOR - HVAC LAYOUT
8	EA-00986-SIT-M1-04	SECOND FLOOR - HVAC LAYOUT
9	EA-00986-SIT-M1-05	THIRD FLOOR - HVAC LAYOUT
10	EA-00986-SIT-M1-06	FOURTH FLOOR - HVAC LAYOUT
11	EA-00986-SIT-M1-07	FIFTH FLOOR - HVAC LAYOUT
12	EA-00986-SIT-M1-08	SIXTH FLOOR - HVAC LAYOUT
13	EA-00986-SIT-M1-09	ROOF - AC EQUIPMENT LAYOUT
14	EA-00986-SIT-M2-01	HVAC EQUIPMENT SCHEDULE
15	EA-00986-SIT-M3-01	INDOOR UNIT INSTALLATION DETAIL
16	EA-00986-SIT-M3-02	MOTOR CONTROL CENTER

Client :



Consultant :



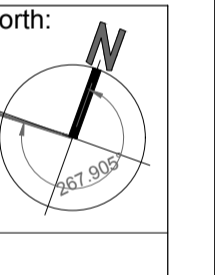
EA Consulting Pvt Ltd
Head Office AL-9, 15th Lane, Khayaban-e-Hial, Phase 7,
Defence Housing Authority, Karachi. 75600 - Pakistan
Phone No. 111-111-584, Fax No. 584-1825
Email : info@eaworld.com | www.eaworld.com

Project :

**DEVELOPMENT OF
SMIU CAMPUS
KARACHI**

Key Plan :

Note:
• All Dimensions to be confirmed on site with architect.
• Do not scale.
• Only written dimensions to be followed.
• Any discrepancies to be clarified with the architect.
• For structure details refer structure engineer drawings / details



0	Nov-2019	ISSUED FOR TENDER
No.	DATE	DESCRIPTION
REVISIONS		

Date of Issue	November, 2019
Issued To	Client
Issued For	Tender

HVAC

Status: **TENDER**

Building Name:
**IT BLOCK
CITY CAMPUS**

Drawing Title :
LIST OF HVAC DRAWINGS

Designed : M.U	Checked : M.J	Approved : S.Z
Drawn : Z.S	Date : May 2018	Scale / Sheet : NTS
Project Code :	00986	Rev. : 0
Drawing No. :	EA-00986-SIT-M0-01	

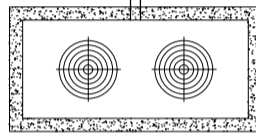
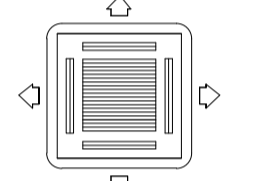
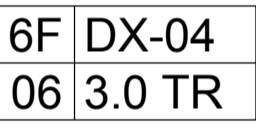
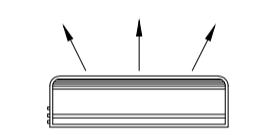



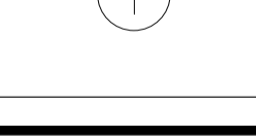
ABBREVIATION

CU	CONDENSING UNIT
CD	CONDENSATE DRAIN
CDP	CONDENSATE DRAIN PIPE
DB	DRY BULB
DL	DOOR LOUVER
DR	DRAIN
F/A-F/B	FROM ABOVE / FROM BELOW
DX	DIRECT EXPANSION WALL MOUNTED
HP	HORSE POWER
Kpa	KILO PASCAL
TR	TONS
CFM	CUBIC FEET PER MINUTE
RPM	REVOLUTIONS PER MINUTE
S/S	START / STOP
SA	SUPPLY AIR
WB	WET BULB
Ⓣ	THERMOSTAT
T/A	TO ABOVE

ABBREVIATION

T/B	TO BELOW
THK	THICKNESS
TYP.	TYPICAL
TR	REFRIGERATION TONS
∅	DIAMETER

LEGENDS

	OUT DOOR CONDENSING UNIT
	CASSETTE TYPE UNIT (4-WAY)
	EQUIPMENT DESIGNATION
	DX INDOOR UNIT DECORATIVE TYPE
	REFRIGERANT PIPE LIQUID & GAS
	CONDENSATE DRAIN
	THERMOSTAT
	MOTOR CONTROL CENTER (MCC)

GENERAL NOTES

- ALL SERVICE RUNS AND CONNECTIONS, ACCESSORIES ANCILLARY, EQUIPMENT AND BUILDERS WORKS SHALL BE PROVIDED TO SUIT EQUIPMENT INCLUDED BY THE CONTRACTOR IN HIS TENDER, WHERE APPLICABLE AND WHERE INDICATED.
- ALL REFRIGERANT PIPE SIZES SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO CONSTRUCTION.
- ALL EQUIPMENT PLINTHS/FOUNDATION SHALL BE COORDINATED WITH STRUCTURE AND ARCHITECTURE.
- THE EXACT LOCATION AND LEVEL OF ALL WALL MOUNTED THERMOSTATS / SWITCHES SHALL BE SUBJECTED TO ARCHITECT'S APPROVAL BEFORE INSTALLATION.
- RUN INSULATED DRAIN PIPE FROM EACH AC UNIT NEAREST DRAIN POINT, INSULATE DRAIN POINT AND WASTE PIPE UNTIL IT REACHES THE VERTICAL STACK.
- DURING THE PROCESS OF THE WORKS ALL OPEN ENDS OF PIPES, CONDUITS, DUCTS ETC. SHALL BE SUITABLY CAPPED TO PREVENT THE INGRESS OF FOREIGN MATTER.
- ALL PIPES SHALL BE PROPERLY ANCHORED AS REQUIRED TO CONTROL THE MOVEMENT OF PIPES DUE TO THERMAL EXPANSION AND CONTRACTION.
- THE SLOPE OF ALL HORIZONTAL RUN CONDENSATE DRAIN PIPES SHALL BE NOT LESS THAN 1:100.
- ALL ANTI VIBRATION MOUNTS FOR EQUIPMENT SHALL BE OF SPRING TYPE UNLESS OTHERWISE SHOWN ON DRAWINGS.
- FOR PIPES, SLEEVES AND DUCTS THROUGH FIRE BARRIER, THE GAP BETWEEN THE PIPES AND ITS SLEEVES, AND THE GAP BETWEEN THE DUCTS AND FIRE BARRIERS SHALL BE FIRE SEALED THROUGH FIRE STOPPING MATERIAL
- INSULATION FOR PIPES AT POINT WHERE THEY PASS THROUGH FIRE BARRIERS SHALL HAVE A PERIOD OF FIRE RESISTANCE EQUAL TO THE FIRE BARRIERS.
- ALL SERVICES CROSSING SEISMIC GAP SHALL BE PROVIDED BY FLEXIBLE JOINT.
- CONTRACTOR IS RESPONSIBLE FOR TESTING ADJUSTING AND BALANCING OF THE HVAC SYSTEM. TESTING ADJUSTING AND BALANCING SHALL BE CARREID OUT BY QUALIFIED FIRMS ENGAGED IN THE FEILD.

Client :



Consultant :



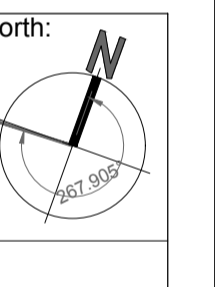
EA Consulting Pvt Ltd
 Head Office: AL-9, 15th Lane, Khayaban-e-Hial, Phase 7,
 Defence Housing Authority, Karachi - 75600 - Pakistan
 Phone No. 111-111-584, Fax No. 584-1825
 Email : info@eaworld.com | www.eaworld.com

Project :

**DEVELOPMENT OF
 SMIU CAMPUS
 KARACHI**

Key Plan :

Note:
 • All Dimensions to be confirmed on site with architect.
 • Do not scale.
 • Only written dimensions to be followed.
 • Any discrepancies to be clarified with the architect.
 • For structure details refer, structure engineer drawings / details



No.	DATE	DESCRIPTION
REVISIONS		

Date of Issue	November, 2019
Issued To	Client
Issued For	Tender

HVAC

Status:

TENDER

Building Name:

**IT BLOCK
 CITY CAMPUS**

Drawing Title :

**GENERAL NOTES, LEGEND
 & ABBREVIATION**

Designed :	Checked :	Approved :
M.U	M.J	S.Z
Drawn :	Date :	Scale / Sheet :
Z.S	May 2018	NTS
Project Code :	Rev. :	
	00986	0
Drawing No. :	EA-00986-SIT-M0-02	



Client :

Consultant :



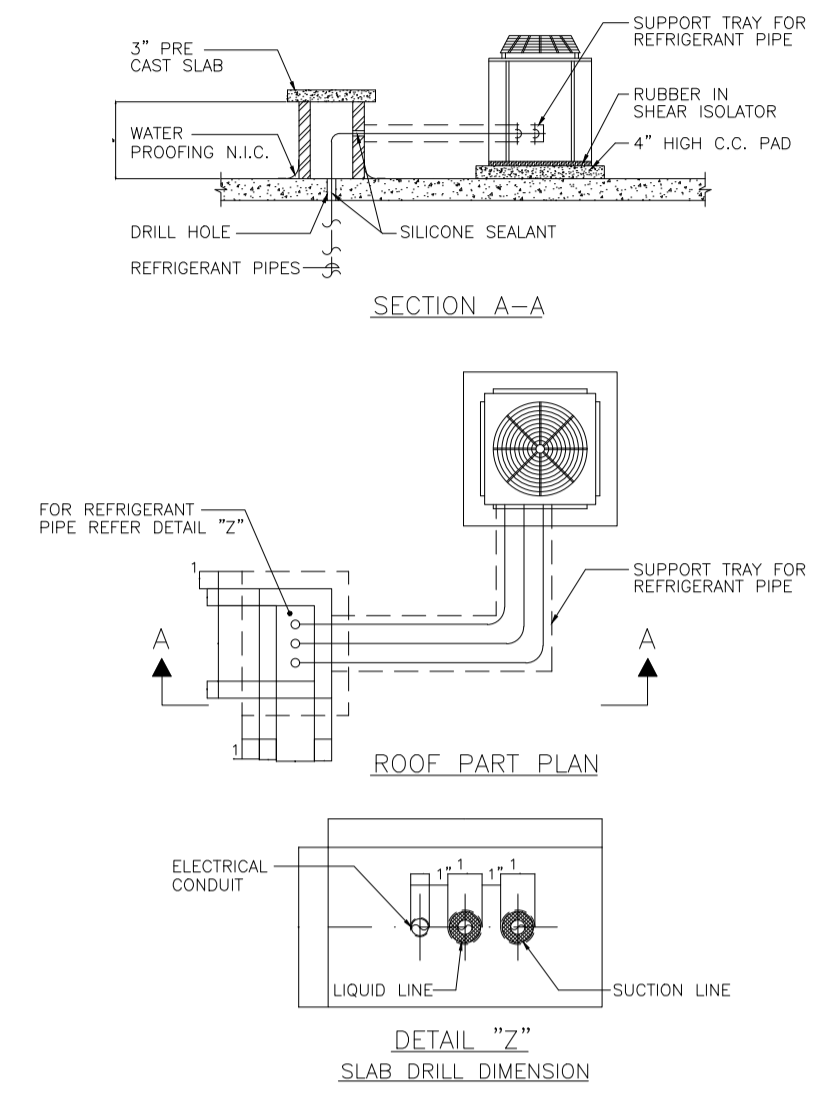
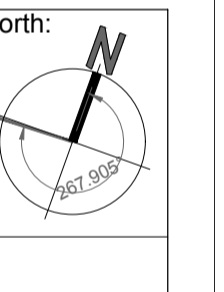
EA Consulting Pvt Ltd
 Head Office: AL-9, 15th Lane, Khayaban-e-Hai, Phase 7,
 Defence Housing Authority, Karachi, 75500 - Pakistan
 Phone No. 111-111-584, Fax No. 584-1825
 Email : info@eaworld.com | www.eaworld.com

Project :

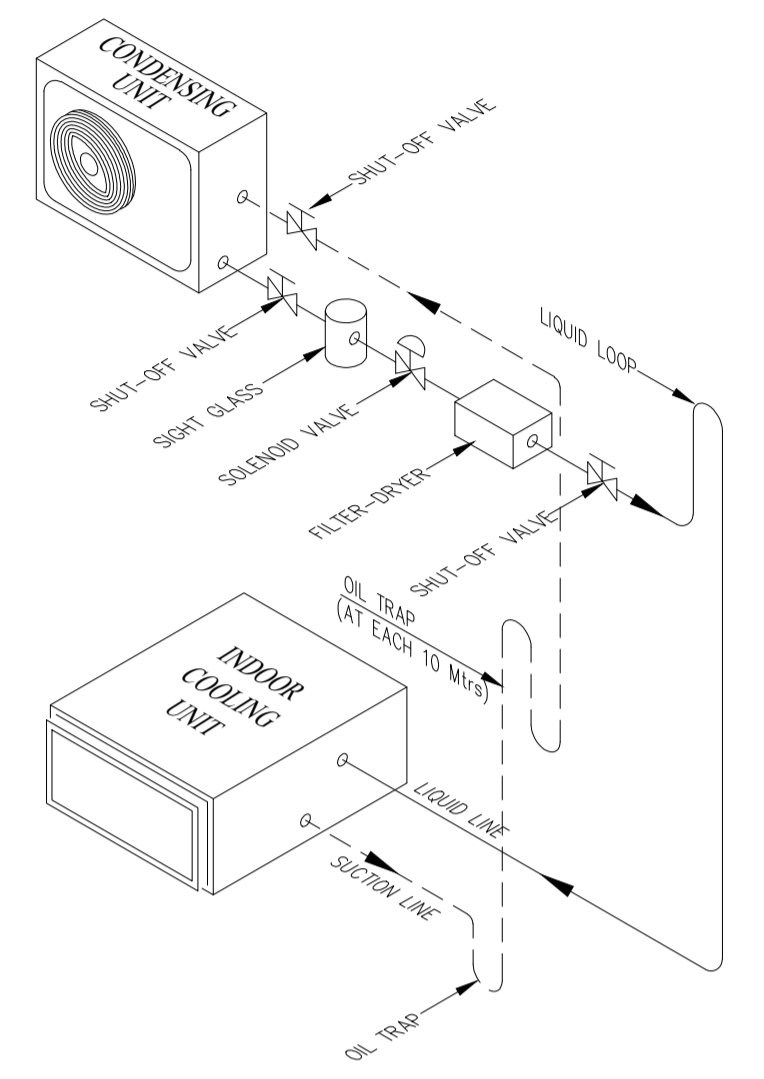
**DEVELOPMENT OF
 SMU CAMPUS
 KARACHI**

Key Plan :

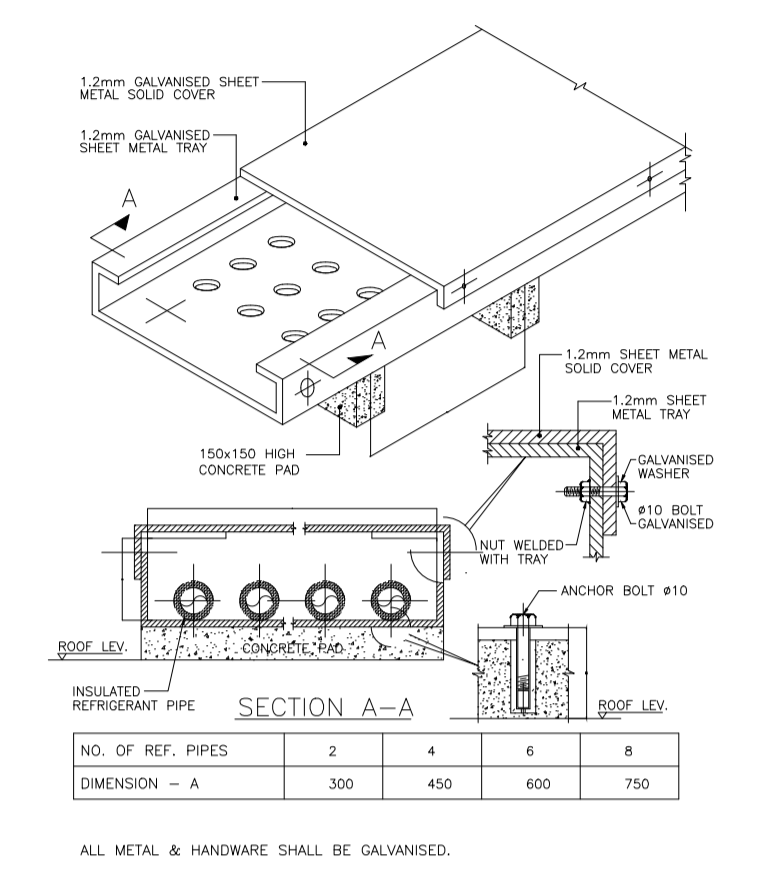
- Note:
- All Dimensions to be confirmed on site with architect.
 - Do not scale.
 - Only written dimensions to be followed.
 - Any discrepancies to be clarified with the architect.
 - For structure details refer structure engineer drawings / details



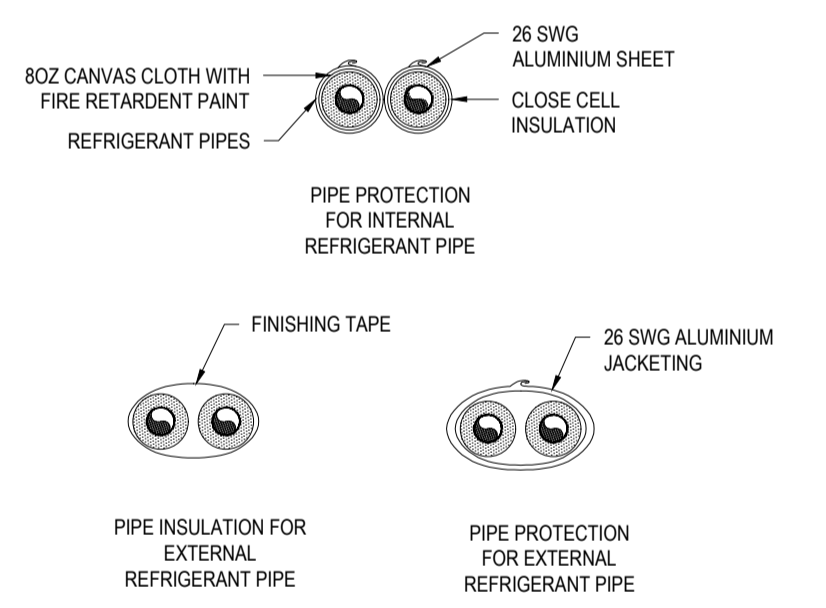
1 REFRIGERANT PIPING THRU ROOF SLAB FOR MINI-SPLIT UNITS
 NTS



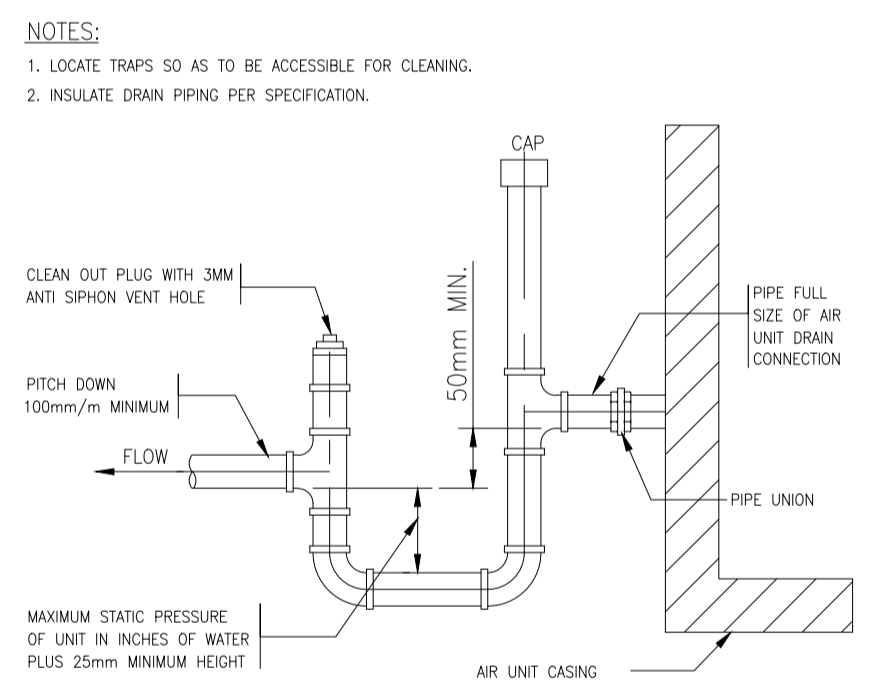
2 TYPICAL REFRIGERANT PIPING SCHEMATIC
 NTS



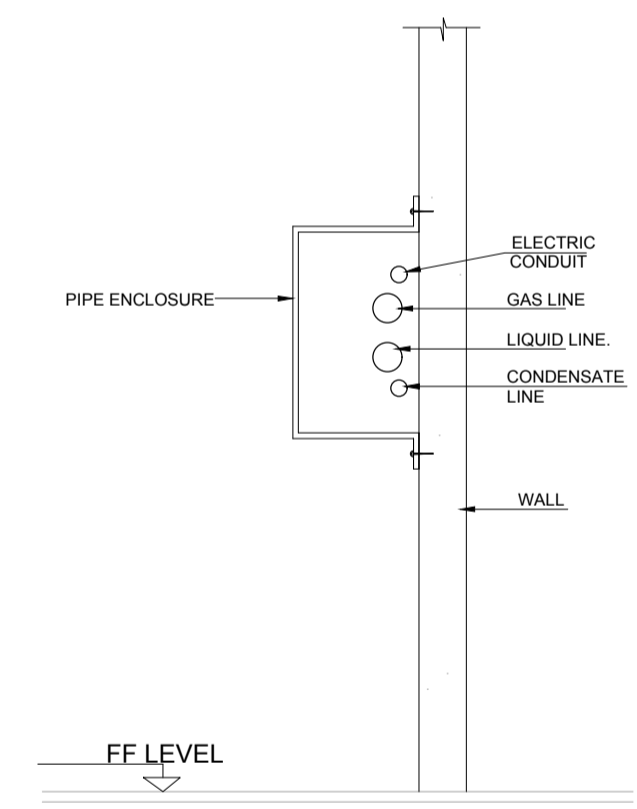
3 SUPPORT TRAY FOR REFRIGERANT PIPES INSTALLED ON ROOF OR WALL
 NTS



4 PIPE PROTECTION FOR INTERNAL & EXTERNAL REFRIGERANT PIPE
 NTS



5 CONDENSATE DRAIN TRAP
 NTS



06 AC PIPES ENCLOSURE DETAILS
 NTS

No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER
REVISIONS		

Date of Issue	November, 2019
Issued To	Client
Issued For	Tender

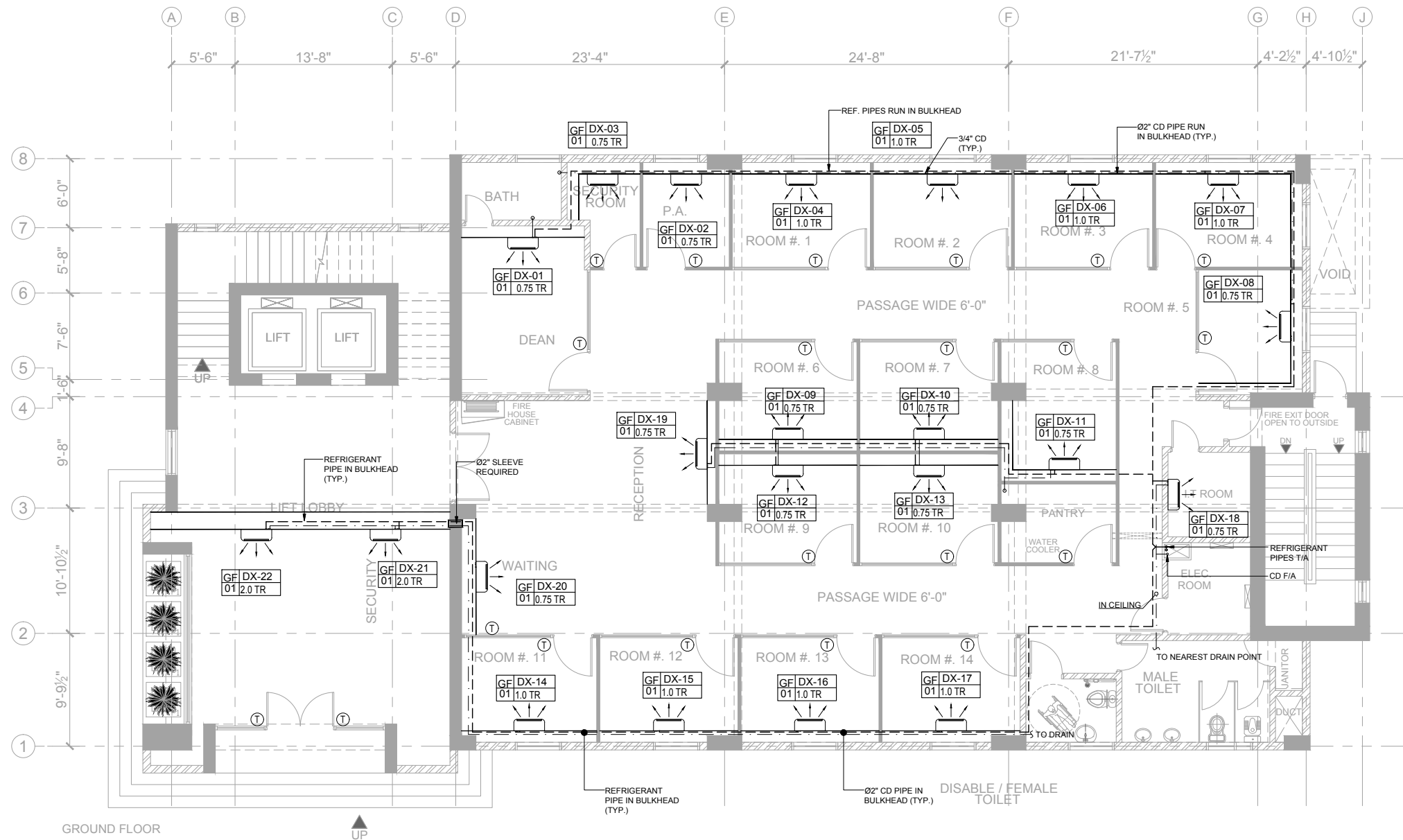
HVAC

Status:
TENDER

Building Name:
**IT BLOCK
 CITY CAMPUS**

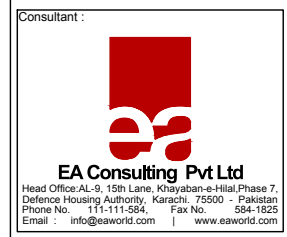
Drawing Title :
HVAC STANDARD DETAIL

Designed :	Checked :	Approved :
M.U	M.J	S.Z
Drawn :	Date :	Scale / Sheet :
Z.S	May 2018	NTS
Project Code :	Rev. :	
	00986	0
Drawing No. :	EA-00986-SIT-M0-03	



NOTE :
 THE CONTRACTOR SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS FOR CONSULTANT / CLIENT APPROVAL.

- MOTOR CONTROL CENTER.
- COMPUTRIZED SELECTION OF COPPER PIPE.
- ELECTRIC POWER AND CONTROL WIRING LAYOUT DRAWING.



Client :
 Consultant :
 Project :
DEVELOPMENT OF SMIU CAMPUS KARACHI

Key Plan :
 (Blank space for key plan)

Note:
 • All Dimensions to be confirmed on site with architect.
 • Do not scale.
 • Only written dimensions to be followed.
 • Any discrepancies to be clarified with the architect.
 • For structure details refer, structure engineer drawings / details

No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER
REVISIONS		

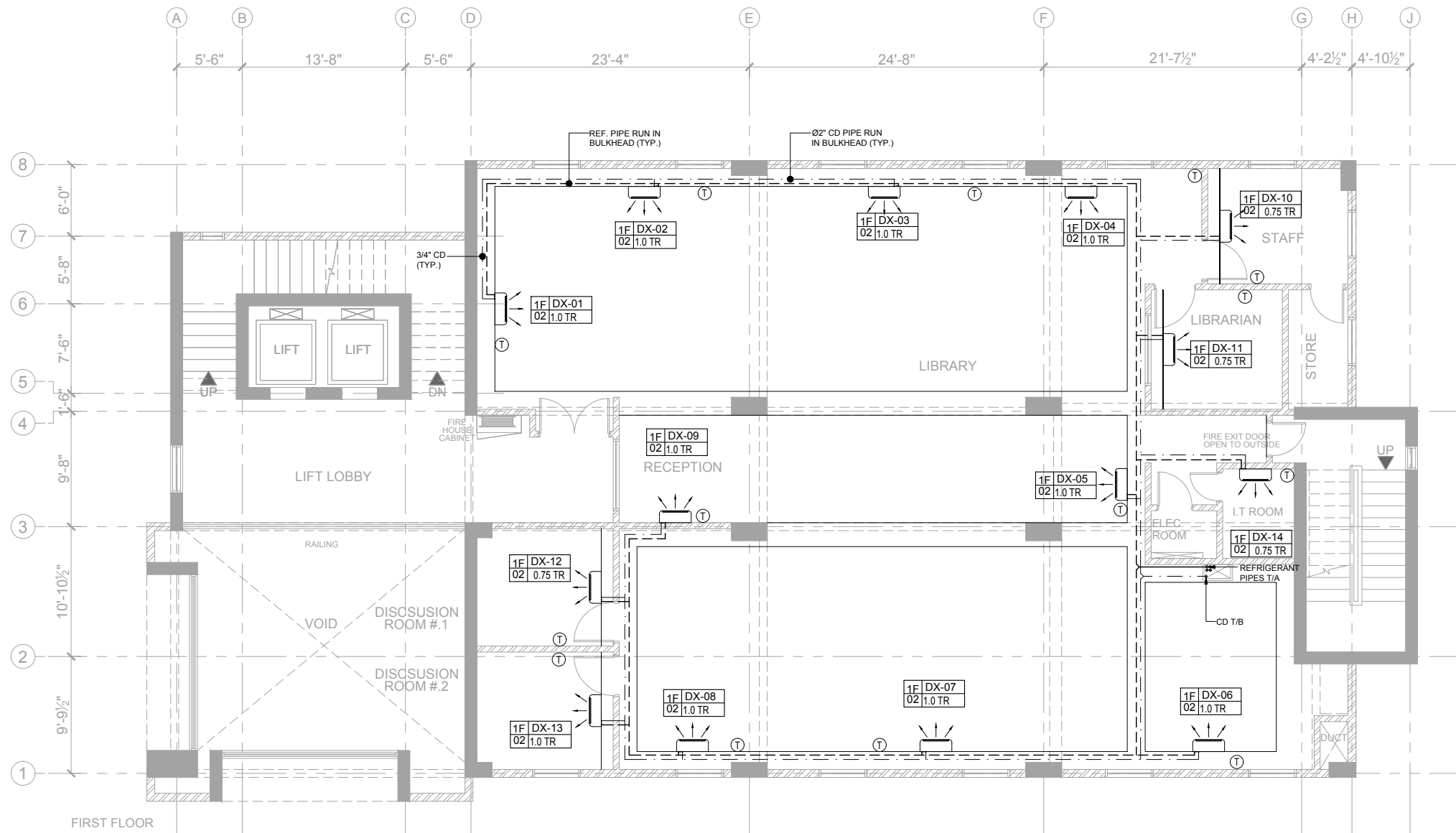
Date of Issue | November, 2019
 Issued To | Client
 Issued For | Tender

HVAC
 Status: **TENDER**

Building Name:
IT BLOCK CITY CAMPUS

Drawing Title:
GROUND FLOOR PLAN HVAC LAYOUT

Designed :	Checked :	Approved :
M.U	M.J	S.Z
Drawn :	Date :	Scale / Sheet :
Z.S	May 2018	3/32"=1'-0"@A3
Project Code :	Rev. :	
00986	0	
Drawing No. :	EA-00986-SIT-M1-02	

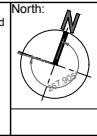


Client :
 Consultant :
EA Consulting Pvt Ltd
 Head Office: AL-9, 15th Lane, Khayaban-e-Hilal, Phase 7,
 Defence Housing Authority, Karachi - 75500 - Pakistan
 Phone No. : 11-111-564, Fax No. : 564-1825
 Email : info@eaworld.com | www.eaworld.com

Project :
**DEVELOPMENT OF
 SMIU CAMPUS
 KARACHI**

Key Plan :

Note:
 • All Dimensions to be confirmed on site with architect.
 • Do not scale.
 • Only written dimensions to be followed.
 • Any discrepancies to be clarified with the architect.
 • For structure details refer, structure engineer drawings / details



No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER
REVISIONS		

Date of Issue | November, 2019
 Issued To | Client
 Issued For | Tender

HVAC
 Status: **TENDER**

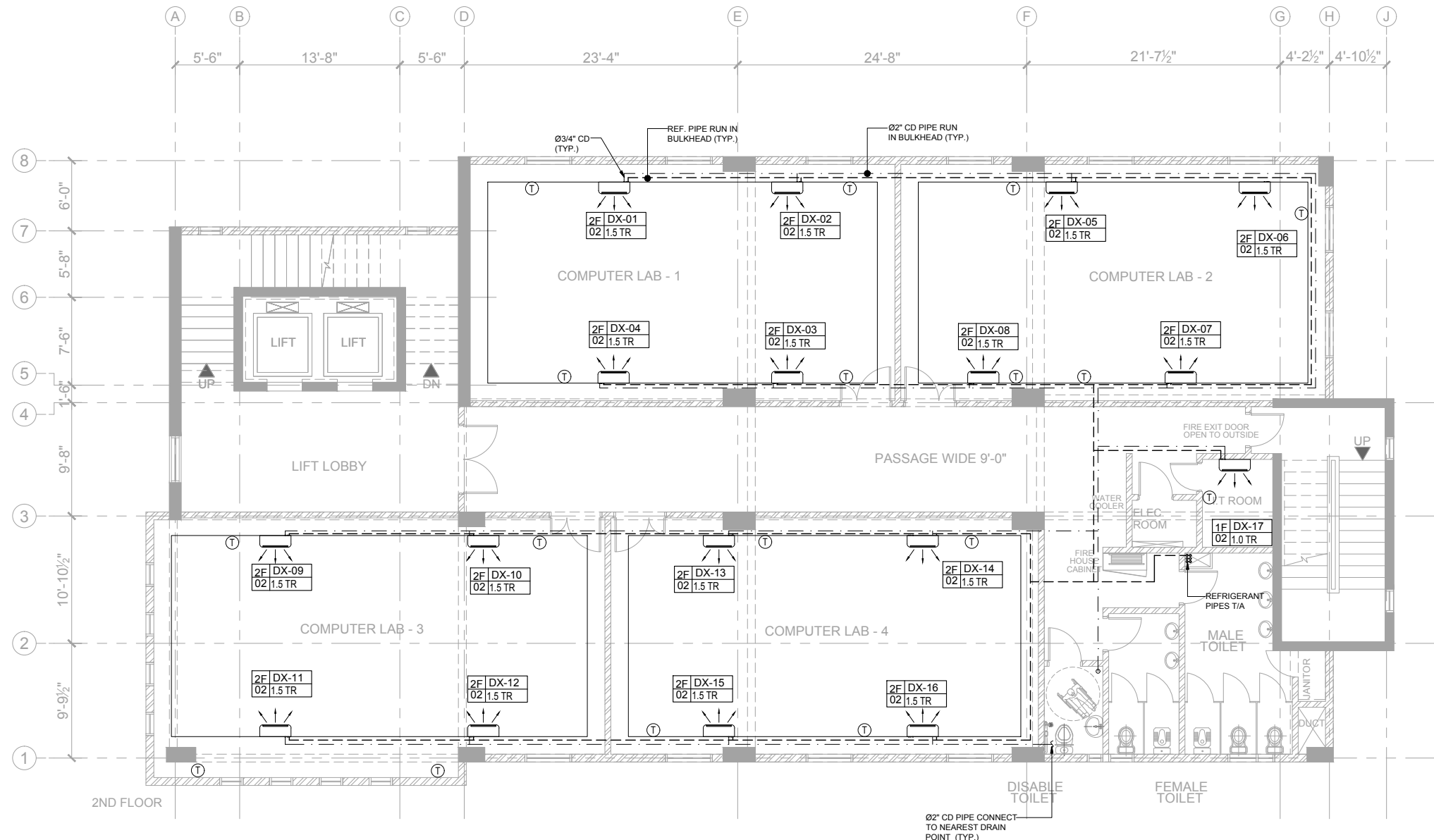
Building Name:
**IT BLOCK
 CITY CAMPUS**

Drawing Title:
**FIRST FLOOR PLAN
 HVAC LAYOUT**

Designed :	Checked :	Approved :
M.U	M.J	S.Z
Drawn :	Date :	Scale / Sheet :
Z.S	May 2018	3/32=1'-0" @ A3
Project Code :	Rev. :	
00986	0	
Drawing No. : EA-00986-SIT-M1-03		

NOTE :
 THE CONTRACTOR SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS FOR CONSULTANT / CLIENT APPROVAL.

- MOTOR CONTROL CENTER.
- COMPUTRIZED SELECTION OF COPPER PIPE.
- ELECTRIC POWER AND CONTROL WIRING LAYOUT DRAWING.



NOTE :
 THE CONTRACTOR SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS FOR CONSULTANT / CLIENT APPROVAL.

- MOTOR CONTROL CENTER.
- COMPUTRIZED SELECTION OF COPPER PIPE.
- ELECTRIC POWER AND CONTROL WIRING LAYOUT DRAWING.



Client :
 Sindh Madressatul Islam University
 1885

Consultant :

EA Consulting Pvt Ltd
 Head Office: AL-9, 15th Lane, Khayaban-e-Hilal, Phase 7, Defence Housing Authority, Karachi, 75500 - Pakistan
 Phone No. : 11-111-564, Fax No. : 584-1825
 Email : info@eaeworld.com | www.eaeworld.com

Project :
DEVELOPMENT OF SMIU CAMPUS KARACHI

Key Plan :

Note:
 • All Dimensions to be confirmed on site with architect.
 • Do not scale.
 • Only written dimensions to be followed.
 • Any discrepancies to be clarified with the architect.
 • For structure details refer, structure engineer drawings / details

North:

No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER
REVISIONS		

Date of Issue	November, 2019
Issued To	Client
Issued For	Tender

HVAC

Status:
TENDER

Building Name:
IT BLOCK CITY CAMPUS

Drawing Title:
SECOND FLOOR PLAN HVAC LAYOUT

Designed :	Checked :	Approved :
M.U.	M.J.	S.Z.
Drawn :	Date :	Scale / Sheet :
Z.S.	May 2018	3/32=1'-0" @ A3
Project Code :	Rev. :	
00986	0	
Drawing No. :	EA-00986-SIT-M1-04	



Client :

Consultant :



EA Consulting Pvt Ltd

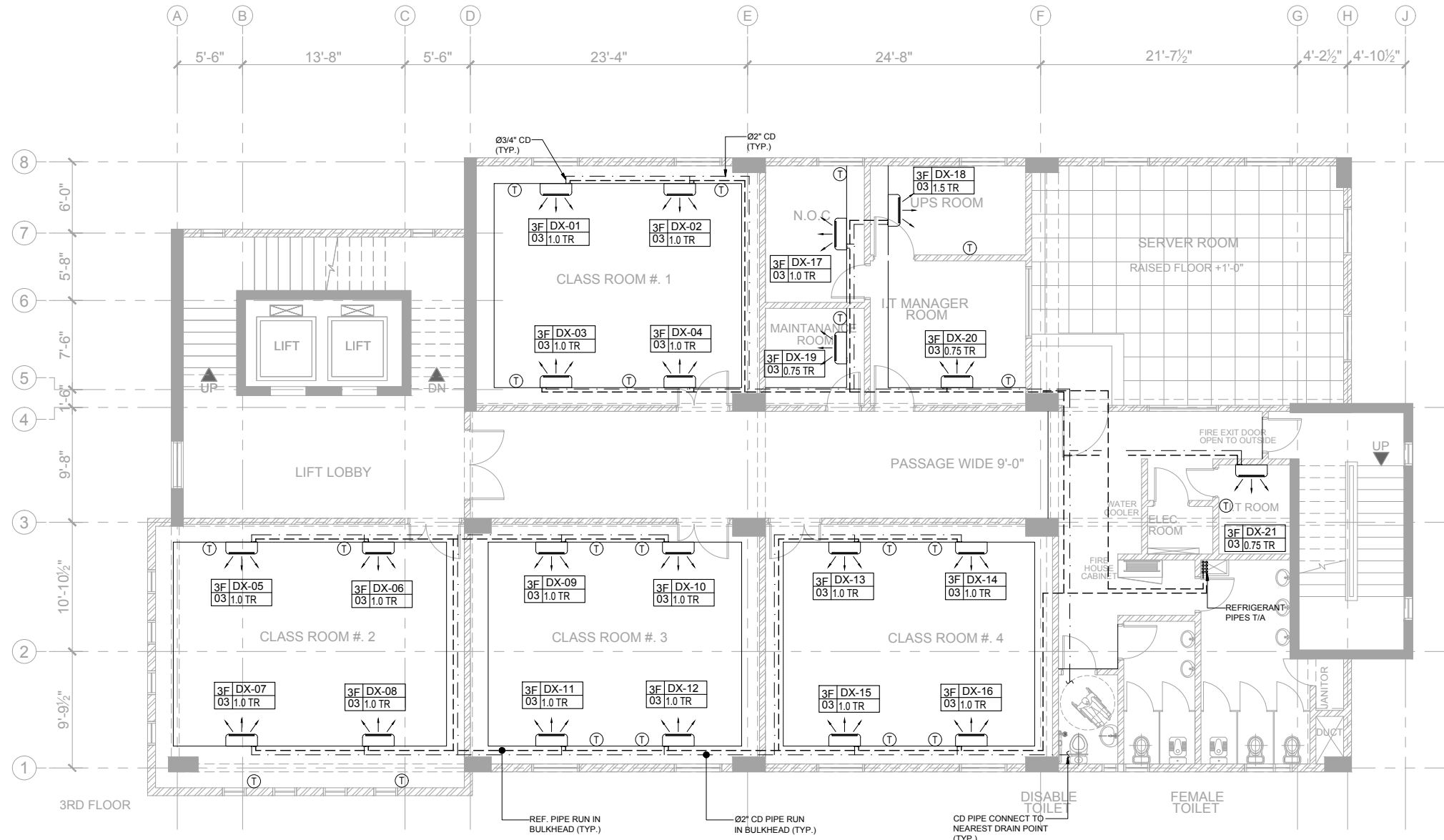
Head Office: AL-9, 15th Lane, Khayaban-e-Hilal, Phase 7,
Defence Housing Authority, Karachi - 75500 - Pakistan
Phone No. : 11-11-554, Fax No. : 59-1825
Email : info@eaworld.com | www.eaworld.com

Project :

**DEVELOPMENT OF
SMIU CAMPUS
KARACHI**

Key Plan :

- Note:
- All Dimensions to be confirmed on site with architect.
 - Do not scale.
 - Only written dimensions to be followed.
 - Any discrepancies to be clarified with the architect.
 - For structure details refer structure engineer drawings / details



No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER

Date of Issue	November, 2019
Issued To	Client
Issued For	Tender

HVAC
Status:
TENDER

Building Name:	IT BLOCK CITY CAMPUS
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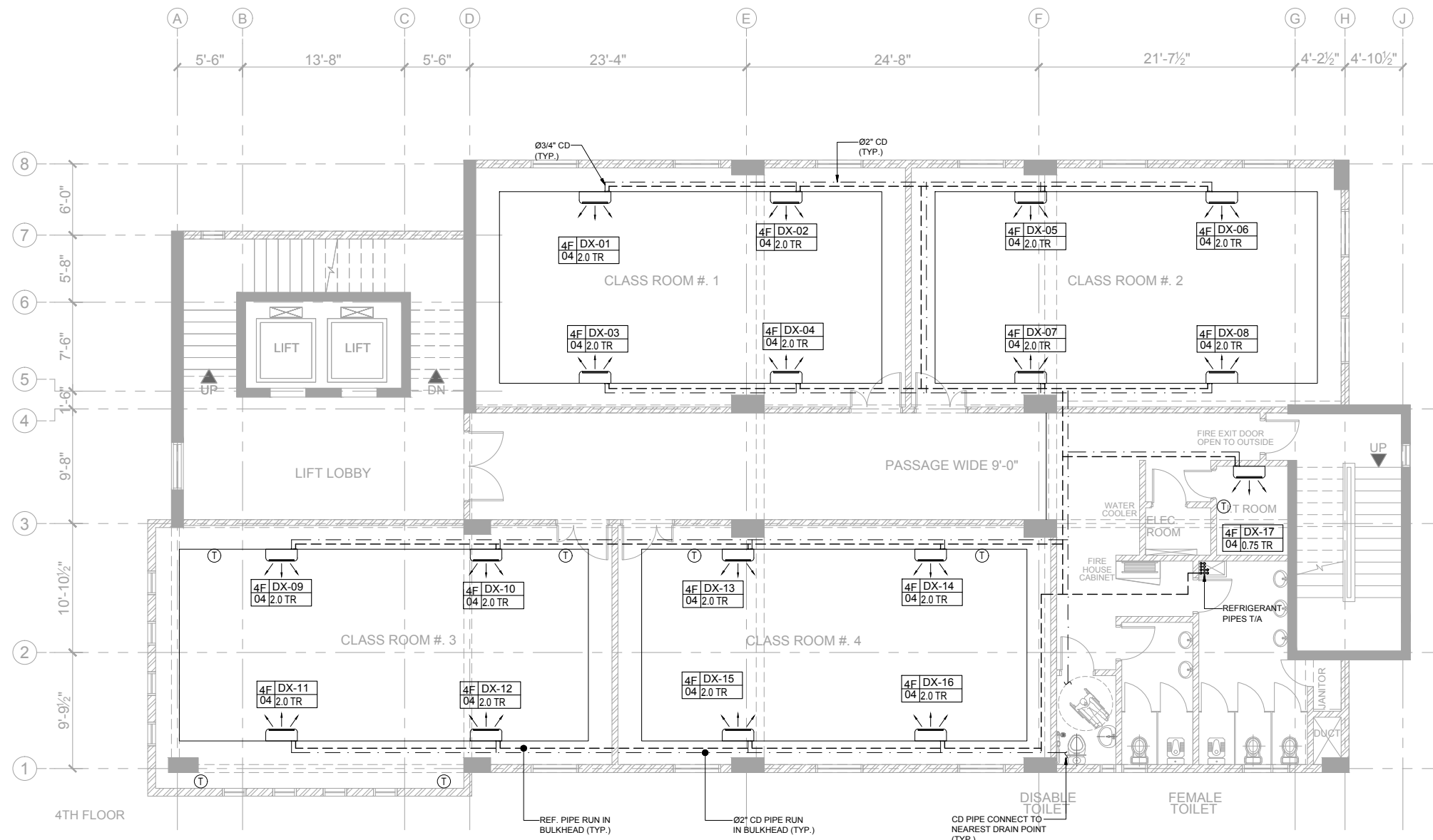
Drawing Title:	THIRD FLOOR PLAN HVAC LAYOUT
----------------	---

Designed :	Checked :	Approved :
M.U	M.J	S.Z
Drawn :	Date :	Scale / Sheet :
Z.S	May 2018	3/32=1'-0\"/>
Project Code :	Rev. :	0
00986		
Drawing No. :	EA-00986-SIT-M1-05	

NOTE :

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS FOR CONSULTANT / CLIENT APPROVAL.

- MOTOR CONTROL CENTER.
- COMPUTRIZED SELECTION OF COPPER PIPE.
- ELECTRIC POWER AND CONTROL WIRING LAYOUT DRAWING.



NOTE :

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS FOR CONSULTANT / CLIENT APPROVAL.

- MOTOR CONTROL CENTER.
- COMPUTRIZED SELECTION OF COPPER PIPE.
- ELECTRIC POWER AND CONTROL WIRING LAYOUT DRAWING.



Client :

Consultant :

EA Consulting Pvt Ltd
 Head Office: AL-9, 15th Lane, Khayaban-e-Hilal, Phase 7, Defence Housing Authority, Karachi - 75500 - Pakistan
 Phone No. : 11-111-564, Fax No. : 584-1825
 Email : info@eaeworld.com | www.eaeworld.com

Project :

DEVELOPMENT OF SMIU CAMPUS KARACHI

Key Plan :

Note:

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- Do not scale.
- Only written dimensions to be followed.
- Any discrepancies to be clarified with the architect.
- For structure details refer, structure engineer drawings / details

North:

No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER
REVISIONS		

Date of Issue: November, 2019
 Issued To: Client
 Issued For: Tender

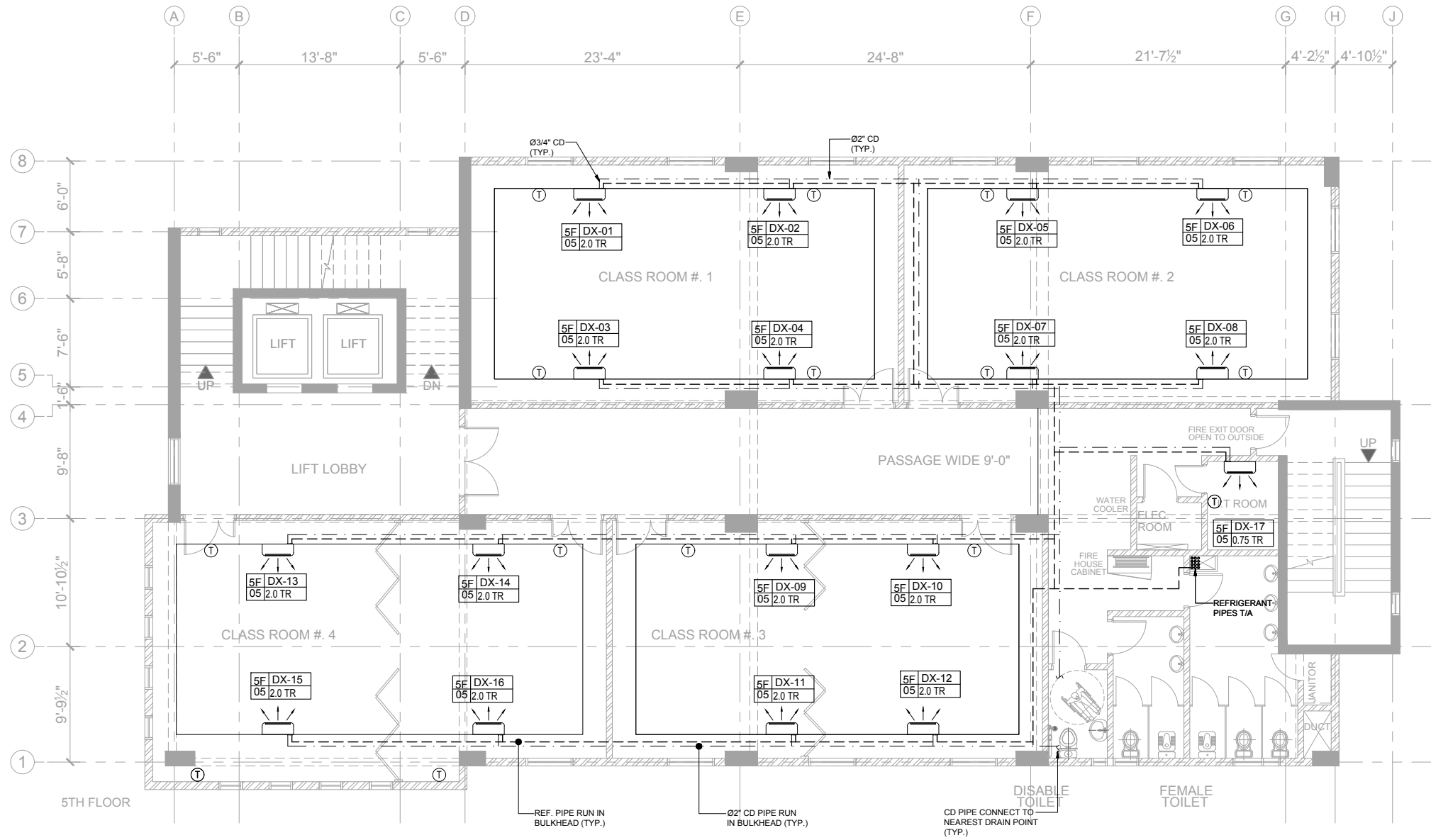
HVAC

Status: **TENDER**

Building Name: **IT BLOCK CITY CAMPUS**

Drawing Title: **FOURTH FLOOR PLAN HVAC LAYOUT**

Designed :	Checked :	Approved :
M.U.	M.J.	S.Z.
Drawn :	Date :	Scale / Sheet :
Z.S.	May 2018	3/32=1'-0" @ A3
Project Code :	Rev. :	
00986	0	
Drawing No. :	EA-00986-SIT-M1-06	



NOTE :

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS FOR CONSULTANT / CLIENT APPROVAL.

- MOTOR CONTROL CENTER.
- COMPUTRIZED SELECTION OF COPPER PIPE.
- ELECTRIC POWER AND CONTROL WIRING LAYOUT DRAWING.

Client :

Consultant :

EA Consulting Pvt Ltd
 Head Office: AL-9, 15th Lane, Khayaban-e-Hilal, Phase 7, Defence Housing Authority, Karachi - 75500 - Pakistan
 Phone No. : 11-111-564, Fax No. : 564-1825
 Email : info@eaworld.com | www.eaworld.com

Project : **DEVELOPMENT OF SMIU CAMPUS KARACHI**

Key Plan :

Note:
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 • Do not scale.
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 • Any discrepancies to be clarified with the architect.
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North:

No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER

REVISIONS

Date of Issue: November, 2019
 Issued To: Client
 Issued For: Tender

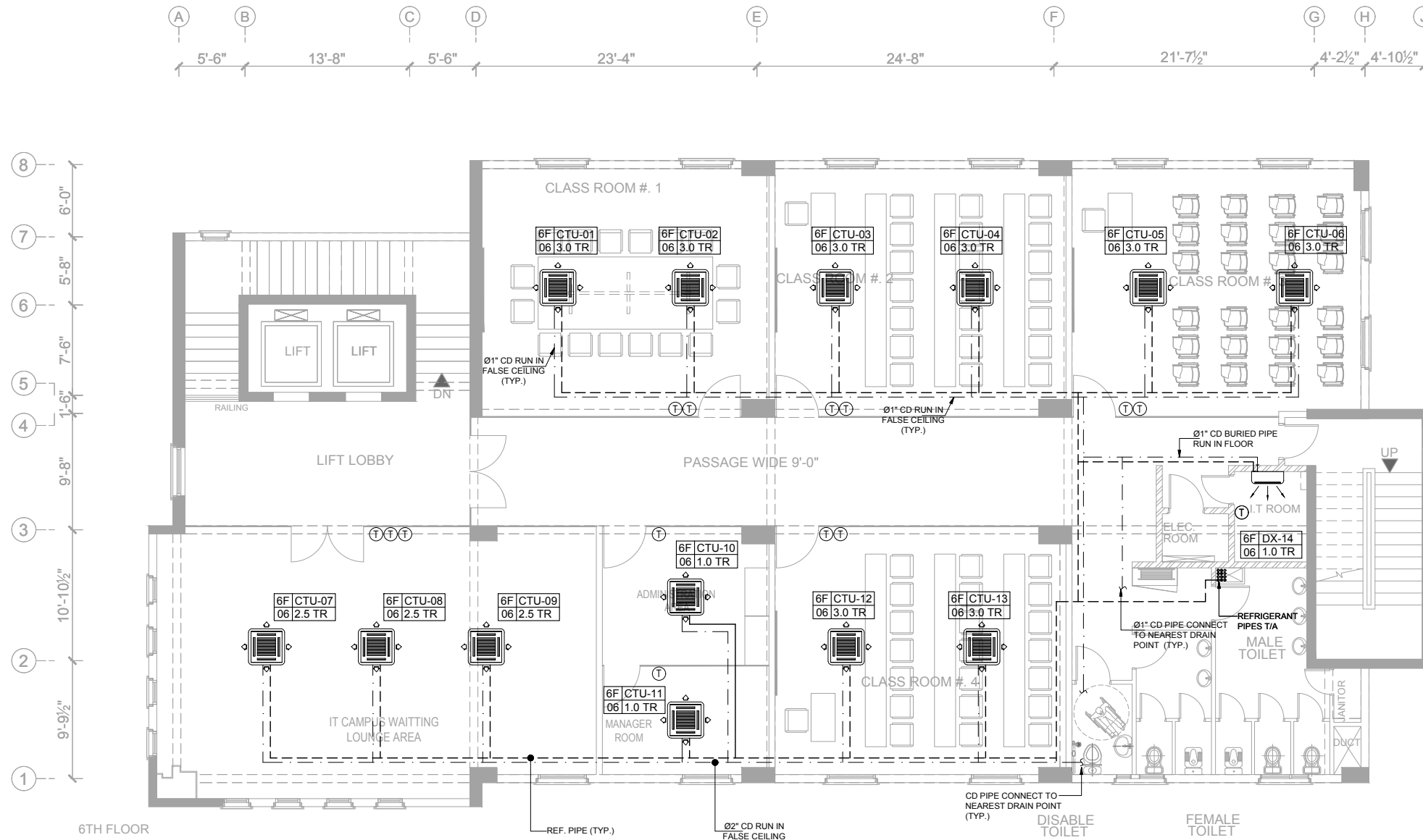
HVAC

Status: **TENDER**

Building Name: **IT BLOCK CITY CAMPUS**

Drawing Title: **FIFTH FLOOR PLAN HVAC LAYOUT**

Designed :	Checked :	Approved :
M.U.	M.J.	S.Z.
Drawn :	Date :	Scale / Sheet :
Z.S.	May 2018	3/32=1'-0" @ A3
Project Code :	Rev. :	
00986	0	
Drawing No. :	EA-00986-SIT-M1-07	



NOTE :

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS FOR CONSULTANT / CLIENT APPROVAL.

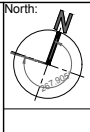
- MOTOR CONTROL CENTER.
- COMPUTRIZED SELECTION OF COPPER PIPE.
- ELECTRIC POWER AND CONTROL WIRING LAYOUT DRAWING.



Client :
 Consultant :
 Project :
DEVELOPMENT OF SMIU CAMPUS KARACHI

Key Plan :

Note:
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 • Only written dimensions to be followed.
 • Any discrepancies to be clarified with the architect.
 • For structure details refer, structure engineer drawings / details



No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER
REVISIONS		

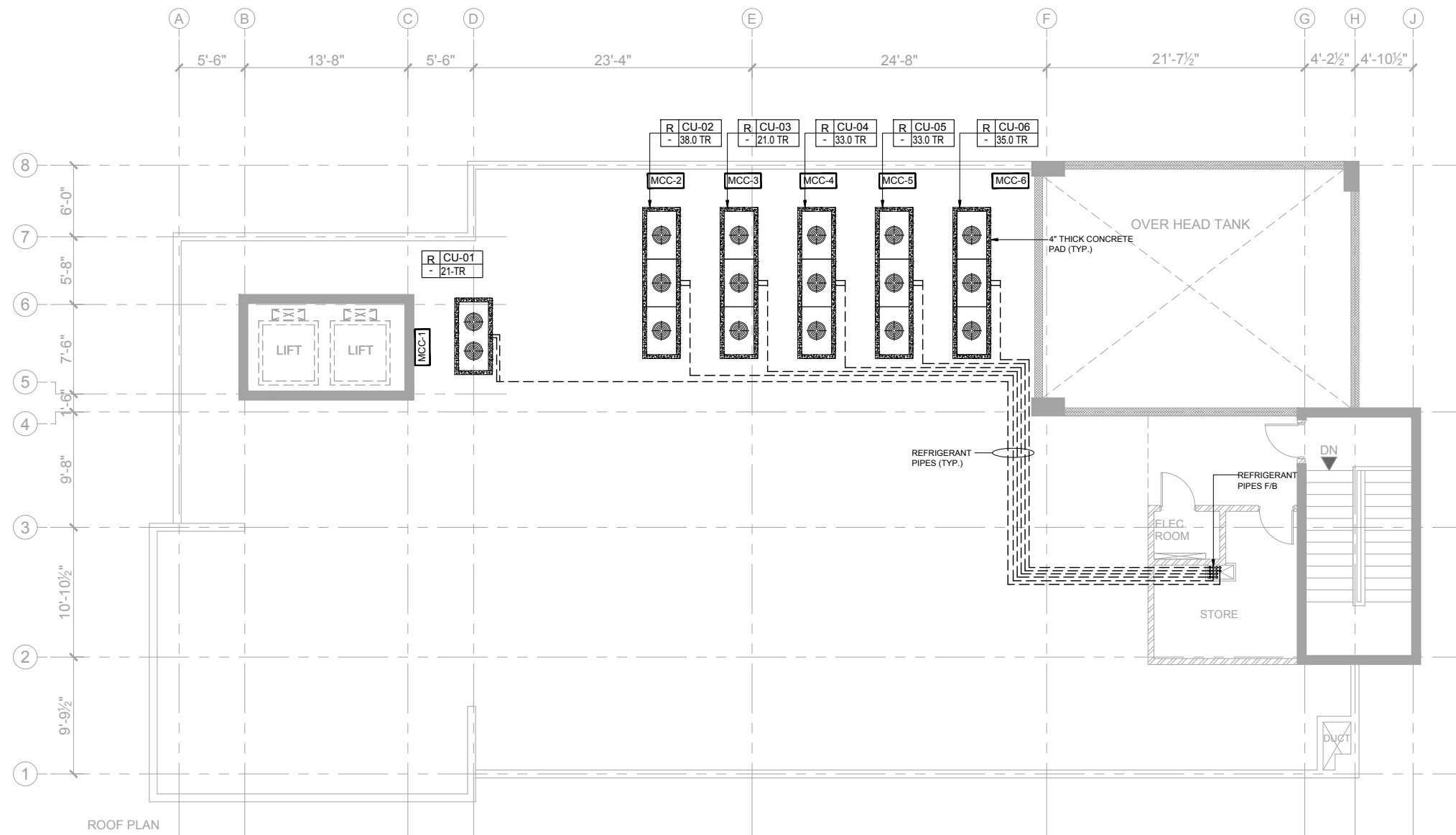
Date of Issue : November, 2019
 Issued To : Client
 Issued For : Tender

HVAC
 Status: **TENDER**

Building Name:
IT BLOCK CITY CAMPUS

Drawing Title:
SIXTH FLOOR PLAN HVAC LAYOUT

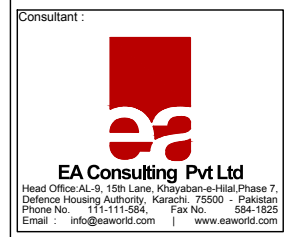
Designed :	Checked :	Approved :
M.U.	M.J.	S.Z.
Drawn :	Date :	Scale / Sheet :
Z.S.	May 2018	3/32"=1'-0"@A3
Project Code :	Rev. :	
00986	0	
Drawing No. : EA-00986-SIT-M1-08		



ROOF PLAN

NOTE :
 THE CONTRACTOR SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS FOR CONSULTANT / CLIENT APPROVAL.

- MOTOR CONTROL CENTER.
- COMPUTRIZED SELECTION OF COPPER PIPE.
- ELECTRIC POWER AND CONTROL WIRING LAYOUT DRAWING.



Client :
 Consultant :
 Project :
DEVELOPMENT OF SMIU CAMPUS KARACHI

Key Plan :

Note:
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 • Do not scale.
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 • Any discrepancies to be clarified with the architect.
 • For structure details refer, structure engineer drawings / details

North:

No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER
REVISIONS		

Date of Issue: November, 2019
 Issued To: Client
 Issued For: Tender

HVAC
 Status: **TENDER**

Building Name:
IT BLOCK CITY CAMPUS

Drawing Title:
ROOF PLAN AC EQUIPMENT LAYOUT

Designed :	Checked :	Approved :
M.U	M.J	S.Z
Drawn :	Date :	Scale / Sheet :
Z.S	May 2018	3/32=1'-0"@A3
Project Code :	Rev. :	
00986	0	
Drawing No. : EA-00986-SIT-M1-09		

GROUND FLOOR													
VARIABLE REFRIGERANT FLOW UNIT (INDOOR)													
S. NO.	TAG NO.	AREA SERVED	LOCATION	COOLING LOAD		EAT °F	LAT °F	ELECTRICAL DATA				QTY.	REMARKS
				SENSIBLE	TOTAL	DB/WB	DB/WB	V	PH	HZ	KW		
1	DX-01	DEAN	GROUND FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
2	DX-02	PA	GROUND FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
3	DX-03	SECURITY ROOM	GROUND FLOOR	0.65	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
4	DX-04	ROOM#1	GROUND FLOOR	0.90	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
5	DX-05	ROOM#2	GROUND FLOOR	1.00	1.00	75 / 62.6	55 / 54	440	3	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
6	DX-06	ROOM#3	GROUND FLOOR	1.00	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
7	DX-07	ROOM#4	GROUND FLOOR	0.90	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
8	DX-08	ROOM#5	GROUND FLOOR	0.75	0.75	75 / 62.6	55 / 54	440	3	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
9	DX-09	ROOM#6	GROUND FLOOR	0.65	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
10	DX-10	ROOM#7	GROUND FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
11	DX-11	ROOM#8	GROUND FLOOR	0.65	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
12	DX-12	ROOM#9	GROUND FLOOR	0.65	0.75	75 / 62.6	55 / 54	440	3	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
13	DX-13	ROOM#10	GROUND FLOOR	0.65	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
14	DX-14	ROOM#11	GROUND FLOOR	1.00	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
15	DX-15	ROOM#12	GROUND FLOOR	0.90	1.00	75 / 62.6	55 / 54	440	3	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
16	DX-16	ROOM#13	GROUND FLOOR	0.90	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
17	DX-17	ROOM#14	GROUND FLOOR	0.90	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
18	DX-18	IT ROOM	GROUND FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
19	DX-19 & 20	WAITING/ RECEPTION	GROUND FLOOR	0.65	0.75	75 / 62.6	55 / 54	220	1	50	0.10	2	DECORATIVE TYPE WALL MOUNTED
20	DX-21 & 22	SECURITY ENTRANCE	GROUND FLOOR	1.90	2.00	75 / 62.6	55 / 54	220	1	50	0.10	2	DECORATIVE TYPE WALL MOUNTED

NOTES:
1. REFRIGERANT PIPE SIZES SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
2. CONTRACTOR TO VERIFY UNITS ELECTRICAL POWER REQUIREMENT.

FIRST FLOOR													
VARIABLE REFRIGERANT FLOW UNIT (INDOOR)													
S. NO.	TAG NO.	AREA SERVED	LOCATION	COOLING LOAD		EAT °F	LAT °F	ELECTRICAL DATA				QTY.	REMARKS
				SENSIBLE	TOTAL	DB/WB	DB/WB	V	PH	HZ	KW		
1	DX-01 TO DX-9	LIBRARY	FIRST FLOOR	0.92	1.00	75 / 62.6	55 / 54	220	1	50	0.10	9	DECORATIVE TYPE WALL MOUNTED
2	DX-10	STAFF	FIRST FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
3	DX-11	LIBRARIAN	FIRST FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE FLOOR STANDING
4	DX-12	DISCUSSION ROOM-1	FIRST FLOOR	0.65	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
5	DX-13	DISCUSSION ROOM-2	FIRST FLOOR	0.90	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
6	DX-14	IT ROOM	FIRST FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED

NOTES:
1. REFRIGERANT PIPE SIZES SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
2. CONTRACTOR TO VERIFY UNITS ELECTRICAL POWER REQUIREMENT.

SECOND FLOOR													
VARIABLE REFRIGERANT FLOW UNIT (INDOOR)													
S. NO.	TAG NO.	AREA SERVED	LOCATION	COOLING LOAD		EAT °F	LAT °F	ELECTRICAL DATA				QTY.	REMARKS
				SENSIBLE	TOTAL	DB/WB	DB/WB	V	PH	HZ	KW		
1	DX-01 TO 04	COMPUTER LAB-1	SECOND FLOOR	1.35	1.50	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
2	DX-05 TO 08	COMPUTER LAB-2	SECOND FLOOR	1.35	1.50	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
3	DX-09 TO 12	COMPUTER LAB-3	SECOND FLOOR	1.35	1.50	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
4	DX-13 TO 16	COMPUTER LAB-4	SECOND FLOOR	1.35	1.50	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
5	DX-17	IT ROOM	SECOND FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED

NOTES:
1. REFRIGERANT PIPE SIZES SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
2. CONTRACTOR TO VERIFY UNITS ELECTRICAL POWER REQUIREMENT.

THIRD FLOOR													
VARIABLE REFRIGERANT FLOW UNIT (INDOOR)													
S. NO.	TAG NO.	AREA SERVED	LOCATION	COOLING LOAD		EAT °F	LAT °F	ELECTRICAL DATA				QTY.	REMARKS
				SENSIBLE	TOTAL	DB/WB	DB/WB	V	PH	HZ	KW		
1	DX-01 TO 04	CLASS ROOM-1	THIRD FLOOR	0.90	1.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
2	DX-05 TO 08	CLASS ROOM-2	THIRD FLOOR	0.90	1.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE FLOOR STANDING
3	DX-09 TO 12	CLASS ROOM-3	THIRD FLOOR	0.90	1.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
4	DX-13 TO 16	CLASS ROOM-4	THIRD FLOOR	0.90	1.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
5	DX-17	NOC	THIRD FLOOR	1.00	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
6	DX-18	UPS ROOM	THIRD FLOOR	1.50	1.50	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
7	DX-19	MAINTENANCE ROOM	THIRD FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
8	DX-20	IT MANAGER ROOM	THIRD FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED
9	DX-21	IT ROOM	THIRD FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED

NOTES:
1. REFRIGERANT PIPE SIZES SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
2. CONTRACTOR TO VERIFY UNITS ELECTRICAL POWER REQUIREMENT.

FOURTH FLOOR													
VARIABLE REFRIGERANT FLOW UNIT (INDOOR)													
S. NO.	TAG NO.	AREA SERVED	LOCATION	COOLING LOAD		EAT °F	LAT °F	ELECTRICAL DATA				QTY.	REMARKS
				SENSIBLE	TOTAL	DB/WB	DB/WB	V	PH	HZ	KW		
1	DX-01 TO 04	CLASS ROOM-1	FOURTH FLOOR	1.85	2.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
2	DX-05 TO 08	CLASS ROOM-2	FOURTH FLOOR	1.85	2.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
3	DX-09 TO 12	CLASS ROOM-3	FOURTH FLOOR	1.85	2.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
4	DX-13 TO 16	CLASS ROOM-4	FOURTH FLOOR	1.85	2.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
5	DX-17	IT ROOM	FOURTH FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED

NOTES:
1. REFRIGERANT PIPE SIZES SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
2. CONTRACTOR TO VERIFY UNITS ELECTRICAL POWER REQUIREMENT.

FIFTH FLOOR													
VARIABLE REFRIGERANT FLOW UNIT (INDOOR)													
S. NO.	TAG NO.	AREA SERVED	LOCATION	COOLING LOAD		EAT °F	LAT °F	ELECTRICAL DATA				QTY.	REMARKS
				SENSIBLE	TOTAL	DB/WB	DB/WB	V	PH	HZ	KW		
1	DX-01 TO 04	CLASS ROOM-1	FIFTH FLOOR	1.85	2.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
2	DX-05 TO 08	CLASS ROOM-2	FIFTH FLOOR	1.85	2.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
3	DX-09 TO 12	CLASS ROOM-3	FIFTH FLOOR	1.85	2.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
4	DX-13 TO 16	CLASS ROOM-4	FIFTH FLOOR	1.85	2.00	75 / 62.6	55 / 54	220	1	50	0.10	4	DECORATIVE TYPE WALL MOUNTED
5	DX-17	IT ROOM	FIFTH FLOOR	0.75	0.75	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED

NOTES:
1. REFRIGERANT PIPE SIZES SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
2. CONTRACTOR TO VERIFY UNITS ELECTRICAL POWER REQUIREMENT.

SIXTH FLOOR													
VARIABLE REFRIGERANT FLOW UNIT (INDOOR)													
S. NO.	TAG NO.	AREA SERVED	LOCATION	COOLING LOAD		EAT °F	LAT °F	ELECTRICAL DATA				QTY.	REMARKS
				SENSIBLE	TOTAL	DB/WB	DB/WB	V	PH	HZ	KW		
1	DX-01 & 02	CLASS ROOM-1	SIXTH FLOOR	2.80	3.00	75 / 62.6	55 / 54	220	1	50	0.20	2	4-WAY CASSETTE TYPE
2	DX-03 & 04	CLASS ROOM-2	SIXTH FLOOR	2.80	3.00	75 / 62.6	55 / 54	220	1	50	0.20	2	4-WAY CASSETTE TYPE
3	DX-05 & 06	CLASS ROOM-3	SIXTH FLOOR	2.80	3.00	75 / 62.6	55 / 54	220	1	50	0.20	2	4-WAY CASSETTE TYPE
4	DX-07 TO 09	IT CAMPUS WAITING LOUNGE AREA	SIXTH FLOOR	2.30	2.50	75 / 62.6	55 / 54	220	1	50	0.20	3	4-WAY CASSETTE TYPE
5	DX-10	ADMINISTRATION AREA	SIXTH FLOOR	0.85	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	4-WAY CASSETTE TYPE
6	DX-11	MANAGER ROOM	SIXTH FLOOR	0.85	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	4-WAY CASSETTE TYPE
7	DX-12 & 13	CLASS ROOM-4	SIXTH FLOOR	2.80	3.00	75 / 62.6	55 / 54	220	1	50	0.20	2	4-WAY CASSETTE TYPE
8	DX-14	IT ROOM	SIXTH FLOOR	1.00	1.00	75 / 62.6	55 / 54	220	1	50	0.10	1	DECORATIVE TYPE WALL MOUNTED

NOTES:
1. REFRIGERANT PIPE SIZES SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
2. CONTRACTOR TO VERIFY UNITS ELECTRICAL POWER REQUIREMENT.

VARIABLE REFRIGERANT UNIT (OUTDOOR)												
S. NO.	TAG NO.	INDOOR UNIT SERVED	LOCATION	TOTAL COOLING LOAD		REFRIGERANT	ELECTRICAL DATA				QTY.	REMARKS
				TR	°F		V	PH	HZ	KW		
1	CU-01	DX-01 TO 22 (GROUND FLOOR)	ROOF	21	115	R-410A	400	3	50	25	1	
2	CU-02	DX-01 TO 14 (FIRST FLOOR) & DX-01 TO 17 (SECOND FLOOR)	ROOF	38	115	R-410A	400	3	50	45	1	
3	CU-03	DX-01 TO 21 (THIRD FLOOR)	ROOF	21	115	R-410A	400	3	50	25	1	
4	CU-04	DX-01 TO 17 (FOURTH FLOOR)	ROOF	33	115	R-410A	400	3	50	39	1	
5	CU-05	DX-01 TO 17 (FIFTH FLOOR)	ROOF	33	115	R-410A	400	3	50	39	1	
6	CU-06	DX-01 TO 14 (SIXTH FLOOR)	ROOF	35	115	R-410A	400	3	50	42	1	

NOTES:
1. REFRIGERANT PIPE SIZES SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
2. CONTRACTOR TO VERIFY UNITS ELECTRICAL POWER REQUIREMENT.



Client :
Consultant :
EA Consulting Pvt Ltd
Head Office: AL-9, 15th Lane, Khayaban-e-Haii, Phase 7, Defence Housing Authority, Karachi. 75600 - Pakistan
Phone No. 111-111-584, Fax No. 584-1825
Email : info@eaworld.com | www.eaworld.com

Project :
**DEVELOPMENT OF
SMIU CAMPUS
KARACHI**

Key Plan :
Note:
• All Dimensions to be confirmed on site with architect.
• Do not scale.
• Only written dimensions to be followed.
• Any discrepancies to be clarified with the architect.
• For structure details refer structure engineer drawings / details

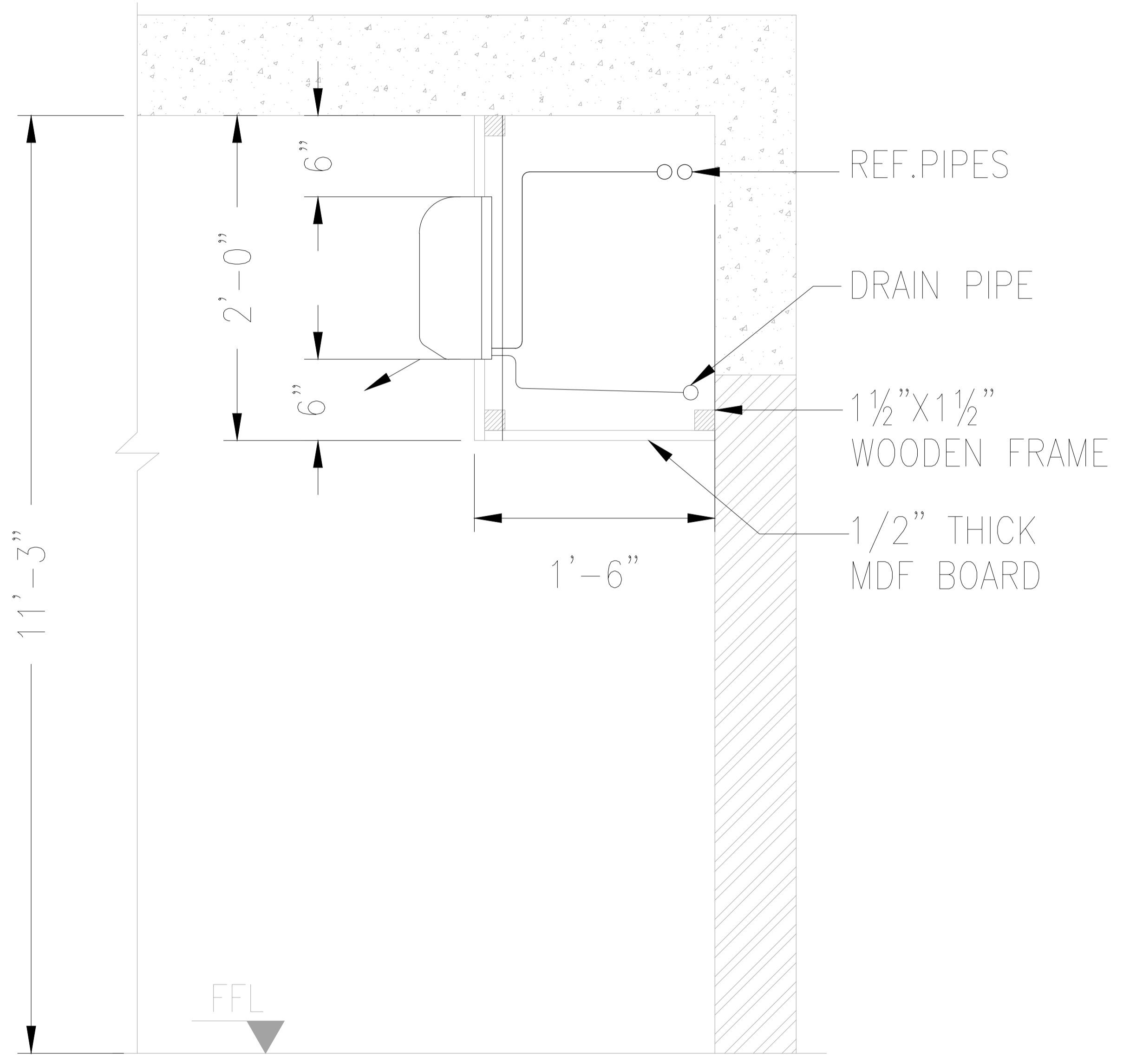
No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER
REVISIONS		

Date of Issue: November, 2019
Issued To: Client
Issued For: Tender

HVAC
Status: **TENDER**

Building Name:
**IT BLOCK
CITY CAMPUS**

Drawing Title :
**HVAC EQUIPMENT
SCHEDULE**
Designed : Checked : Approved :
M.U. M.J. S.Z
Drawn : Date : May 2018 Scale / Sheet :
Z.S. May 2018 NTS
Project Code : 00986 Rev. : 0
Drawing No. : EA-00986-SIT-M2-01



INDOOR UNIT INSTALLATION DETAIL



Client :



Consultant :

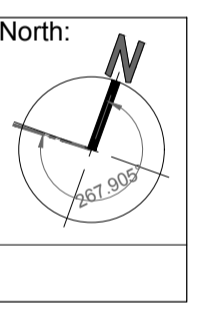
EA Consulting Pvt Ltd
 Head Office AL-9, 15th Lane, Khayaban-e-Hai, Phase 7,
 Defence Housing Authority, Karachi - 75600 - Pakistan
 Phone No. 111-111-584, Fax No. 584-1825
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Project :

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No.	DATE	DESCRIPTION
REVISIONS		

Date of Issue	November, 2019
Issued To	Client
Issued For	Tender

HVAC

Status: **TENDER**

Building Name: **IT BLOCK
 CITY CAMPUS**

Drawing Title : **VRF INDOOR UNIT
 INSTALLATION DETAIL**

Designed : M.U.	Checked : M.J.	Approved : S.Z.
Drawn : Z.S.	Date : May 2018	Scale / Sheet : 3/32"=1'-0" @A3
Project Code :	00986	Rev. : 0
Drawing No. :	EA-00986-SIT-M3-01	



Client :

Consultant :



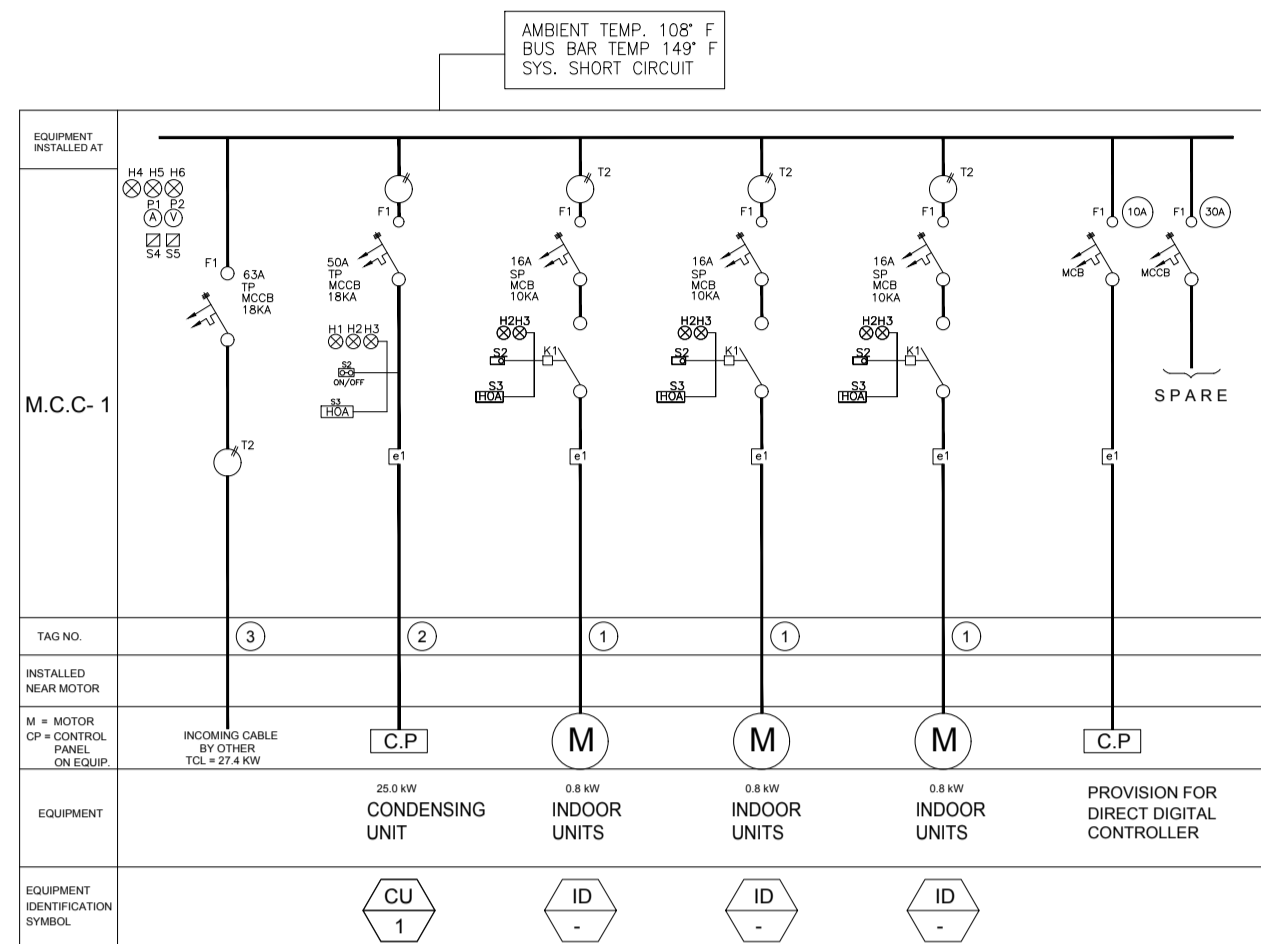
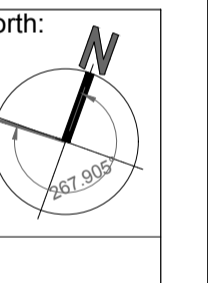
EA Consulting Pvt Ltd
 Head Office: AL-9, 15th Lane, Khayaban-e-Hai, Phase 7,
 Defence Housing Authority, Karachi, 75600 - Pakistan
 Phone No. 111-111-584, Fax No. 584-1825
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Project :

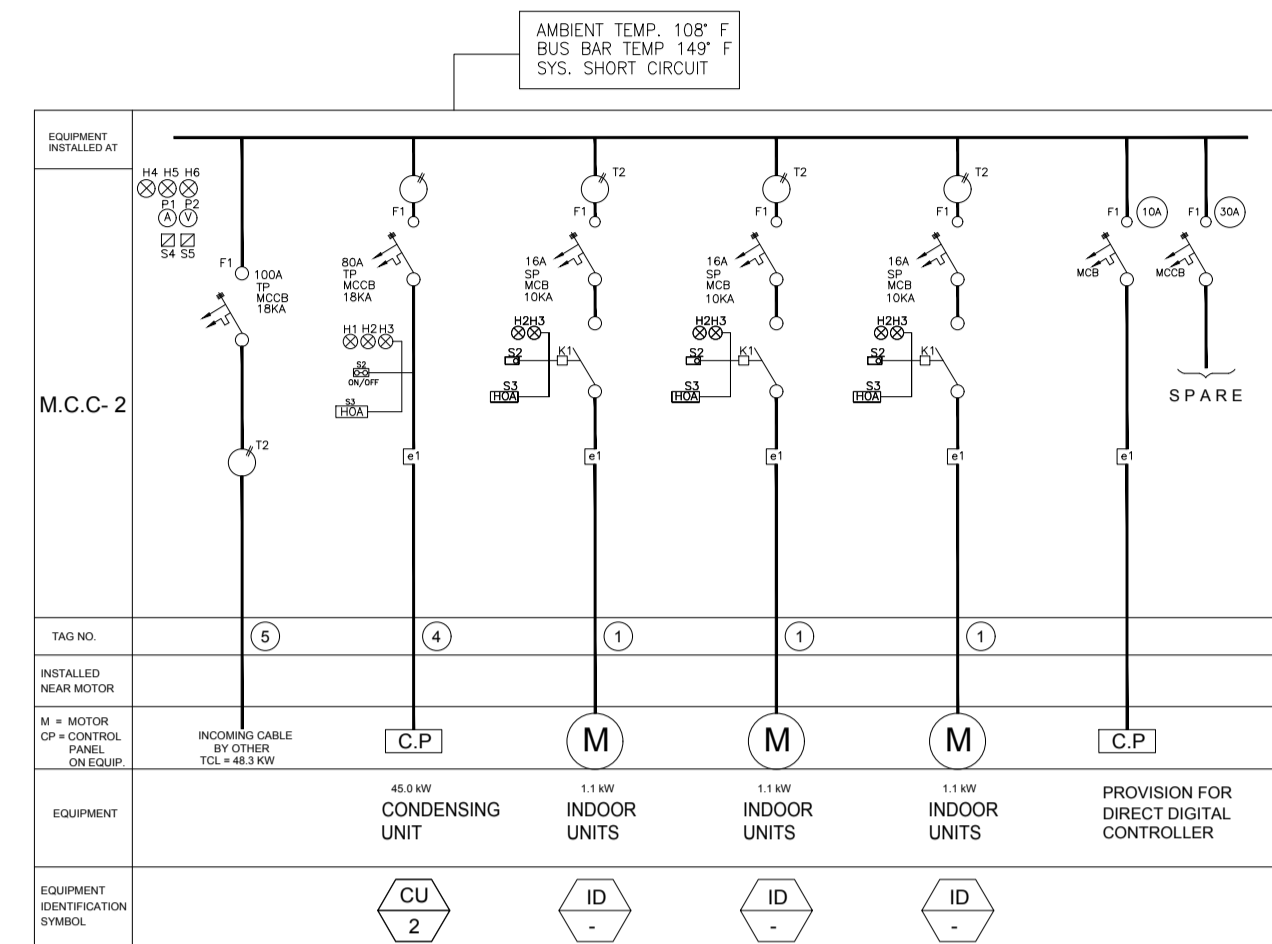
**DEVELOPMENT OF
 SMU CAMPUS
 KARACHI**

Key Plan :

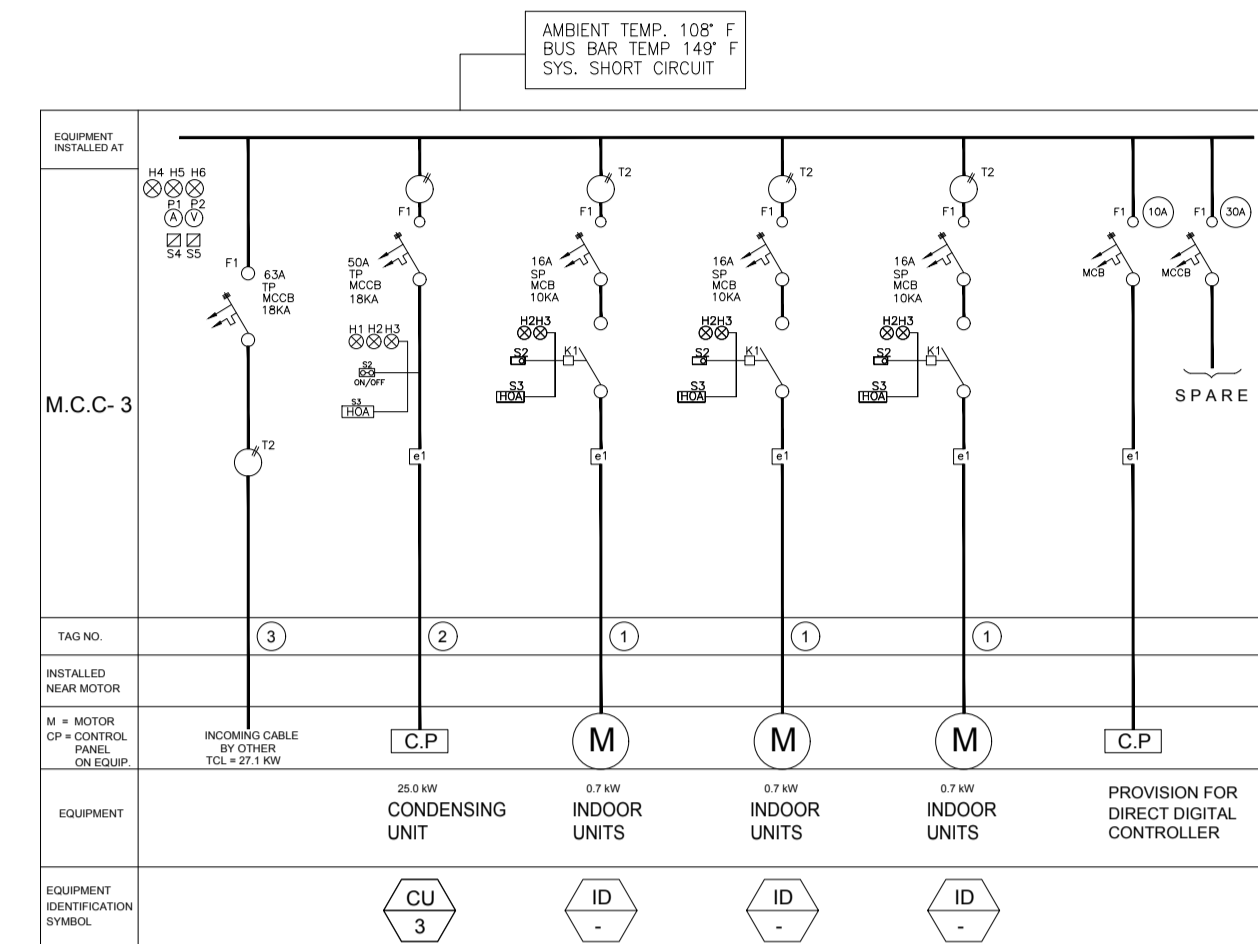
Note:
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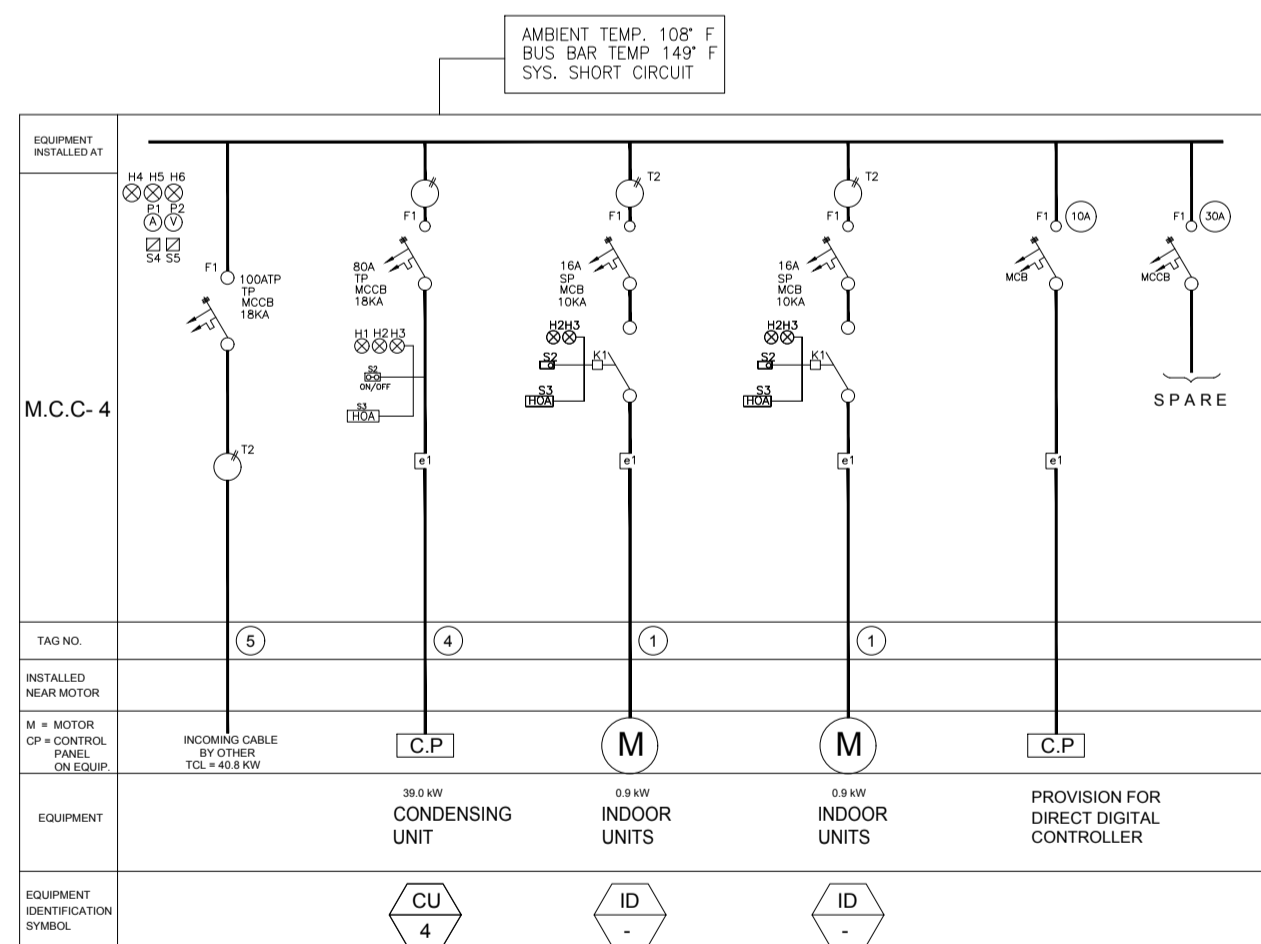
**MOTOR CONTROL CENTER MCC- 1
 LOCATED AT ROOF
 (FOR GROUND FLOOR)**



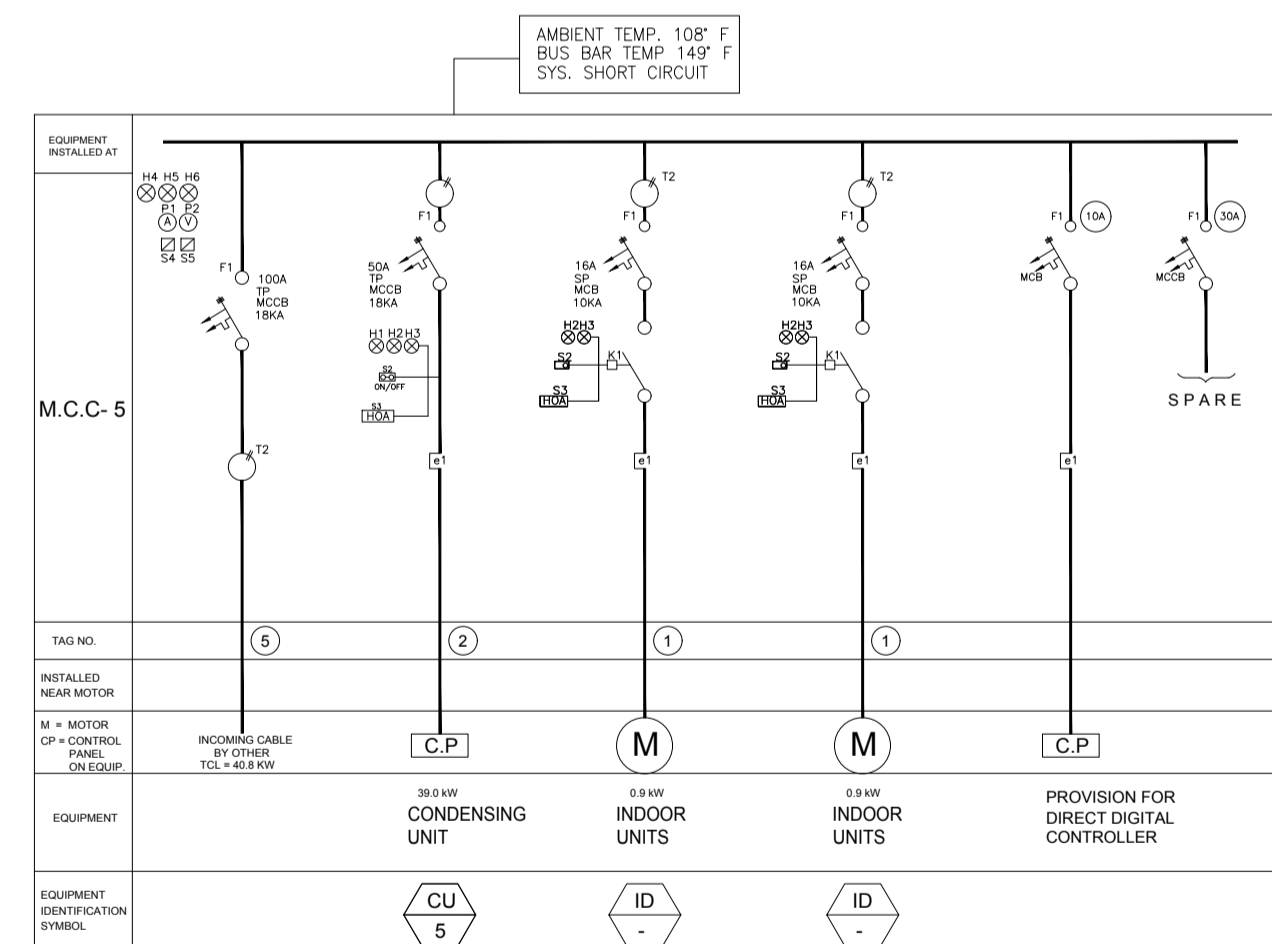
**MOTOR CONTROL CENTER MCC- 2
 LOCATED AT ROOF
 (1ST AND 2ND FLOOR)**



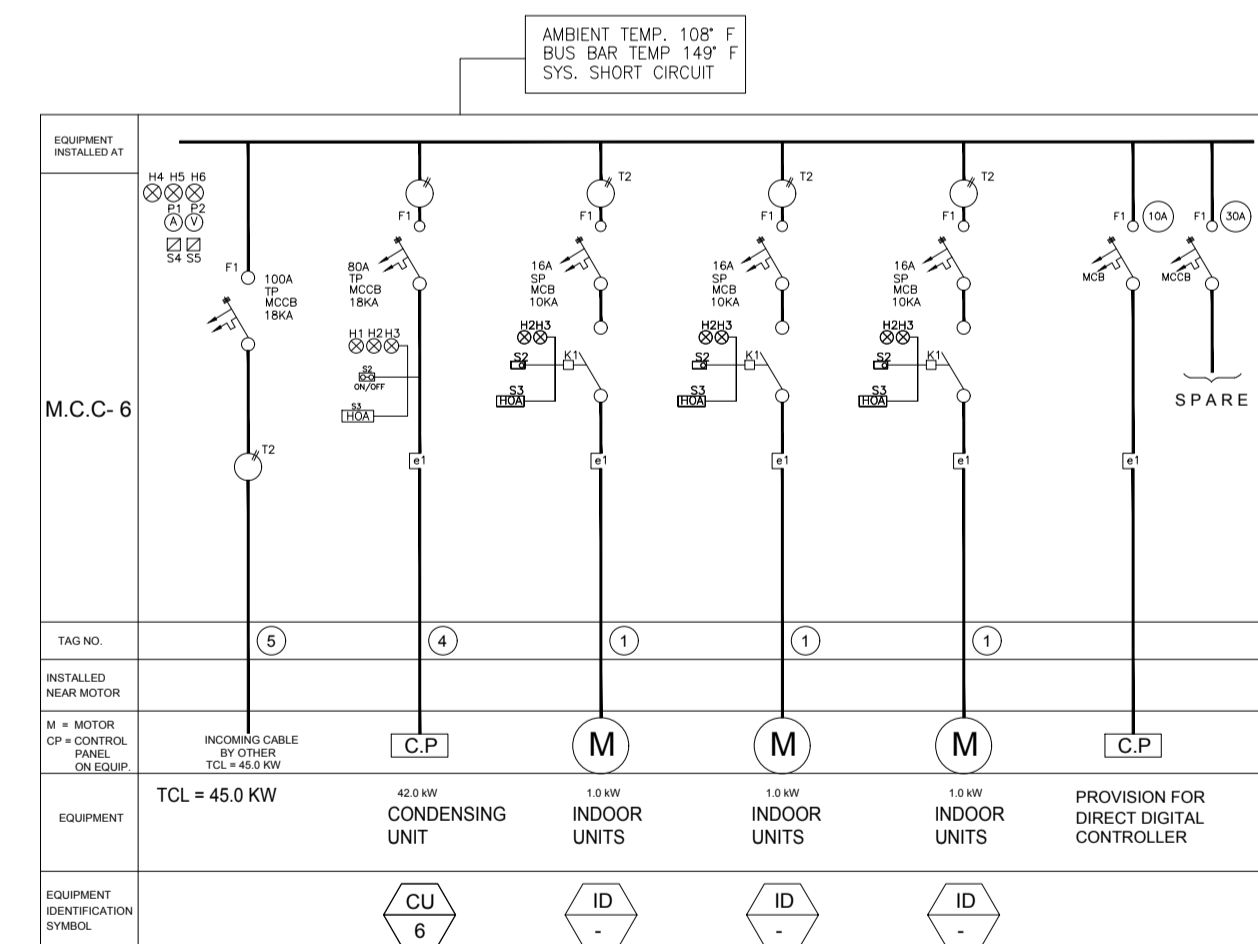
**MOTOR CONTROL CENTER MCC- 3
 LOCATED AT ROOF
 (FOR 3RD FLOOR)**



**MOTOR CONTROL CENTER MCC- 4
 LOCATED AT ROOF
 (FOR 4th FLOOR)**



**MOTOR CONTROL CENTER MCC- 4
 LOCATED AT ROOF
 (FOR 5th FLOOR)**



**MOTOR CONTROL CENTER MCC- 6
 LOCATED AT ROOF
 (FOR 6th FLOOR)**

ELECTRICAL LEGEND			
S#	IDENTIFICATION	DESCRIPTION	REMARKS
1	S1	3 PHASE LOAD BREAK SWITCH	CONTRACTOR WILL FURNISH MAKE & SPECIFICATION OF ALL EQUIPMENT USED IN PANELS FOR APPROVAL
2	S2	ON/OFF PUSH BUTTON	
3	S3	HAND/OFF/AUTOSWITCH	
4	S4	AMMETER SELECTOR SWITCH	
5	S5	VOLTMETER SELECTOR SWITCH	
6	P1	AMMETER	
7	P2	VOLT METER	
8	F1	H.R.C. FUSE	
9	e1	OVER LOAD	
10	H1	INDICATING LIGHT OFF (RED)	
11	H2	INDICATING LIGHT ON (GREEN)	
12	H3	INDICATING LIGHT FAULT (AMBER)	
13	T1	CURRENT TRANSFORMER ON 1, PHASE	
14	T2	CURRENT TRANSFORMER ON 3, PHASE	
15	II >	THERMOSTAT	
16	K1/K2	CONTRACTOR DIRECT (ON LINE)	
17	A.S.D	AUTOMATIC STAR DELTA STARTER	
18	A.C.B	AIR CIRCUIT BREAKER	
19	M.C.C.B.	MOLDED CASE CIRCUIT BREAKER	
20	H4, H5 H6.	PHASE INDICATING (RED, YELLOW, GREEN)	
21	K.W	KILOWATT-HOUR METER	
22	M.C.C.	MOTOR CONTROL CENTER	
23	M.C.B.	MINIATURE CIRCUIT BREAKER	
24	S.D.C.	STAND ALONE DIGITAL CONTROLLER	

CABLE SCHEDULE	
REF.NO.	DESCRIPTION
1	3C-4 SQMM CU/PVC/PVC
2	4C-10+1C-10 SQMM CU/PVC/PVC
3	4C-16+1C-16 SQMM CU/PVC/PVC
4	4C-25+1C-16 SQMM CU/PVC/PVC
5	4C-50+1C-25 SQMM CU/PVC/PVC

NOTES:

- ALL REDUCED VOLTAGE STARTERS SHALL BE CLOSED OR OPEN TRANSITION TYPE & SHALL BE SELECTED ACCORDING TO THE ACTUAL MOTOR H.P. RATING INSTALLED
- ALL 3 PHASE STARTER SHALL INCLUDE A THREE COIL THERMAL OVER LOAD RELAY MOUNTED IN THE STARTERS ENCLOSURES ALL SINGLE PHASE STARTERS SHALL INCLUDE A SINGLE COIL THERMAL OVER LOAD RELAY INDICATED.
- ALL COMPONENTS SHALL BE BUILT IN TO THE ENCLOSURE UNLESS OTHERWISE INDICATED.
- SUPPLY NECESSARY CONTROL TRANSFORMER FOR INTER LOCKING STARTER OF DIFFERENT VOLTAGE ALL CONTROL CIRCUITS 220V, AND ABOVE SHALL BE FUSED PROVIDE DUAL FUSING ON PRIMARY SIDE OF CONTROL TRANSFORMER AND SINGLE FUSING ON SECONDARY SIDE.
- MOTOR OVER LOAD RELAY COIL SHALL BE INSTALLED IN EACH MOTOR STARTER AND SHALL BE PROPERLY SIZED AFTER EXACT MOTOR FULL RUNNING CURRENTS KNOWN FROM OPERATIONAL DATA AND SHALL BE FILED ADJUSTED.
- MAIN BUS SHALL BRACED FOR 40KA UNLESS OTHERWISE INDICATED PROVIDE 1/8" x 1" CONTINUOUS GROUND BUS.
- AUTOMATIC CONTROL DEVICES SHALL BE WIRED TO AUTO POSITION OF HOA SWITCHES INSTALL WIRING DIAGRAM IN FRAMED GLASS ENCLOSURE NEAR M.C.C.
- AMMETERS SHALL BE INSTALLED ON M.C.C. FOR ALL MOTORS 7.5 HP AND ABOVE
- DATA ON THIS DRAWING IS FOR INDICATION ONLY CONTRACTOR SHALL PROVIDE ALL ITEMS AS PER EQUIPMENT SUPPLIED.
- ALL LAMPS SHALL BE WIRED TO TEST ON M.C.C.
- IN COMING VOLT METER & AMMETER WITH C.T. SHALL BE PROVIDED
- INDICATION LIGHTS ON INCOMING PHASES SHALL BE PROVIDED
- ALL CONTROL WIRING SHALL BE DRAWN IN SEPARATE G.I. STEEL CONDUIT.
- INDICATION LIGHTS SHALL BE PROVIDED FOR ALL AIR HANDLING UNITS. NUMBERED SUITABLE INDICATION SHALL BE PROVIDED WITH EACH SET OF LIGHTS
- THE CONTRACTOR IS RESPONSIBLE FOR ALL CABLING AND CONDUITING FROM M.C.C. TO RESPECTIVE EQUIPMENT IN PLANT ROOM AND AHU ROOMS.
- ALL 3 PHASE SUPPLY SHALL BE THROUGH 4 CORES CABLE AND ALL 1 PHASE SUPPLY SHALL BE THROUGH 3 CORES CABLES
- PVC/PVC CABLES SHALL BE USED FOR WIRING FROM M.C.C. TO RESPECTIVE EQUIPMENT.
- CONTRACTOR SHALL REVERIFY CABLE SIZES & FUSE RATING BASED ON THE MOTOR KW.
- ALL M.C.C LOCATED AT ROOF ARE IP RATED 54.
- FOR LOCATION OF M.C.C. PLEASE REFER ELECTRICAL DRAWINGS.
- ALL M.C.C. HAS "H-O-A" SWITCHES MOTOR START MANUALLY WHEN SWITCH POSITION IS ON "HAND". AT "AUTO" POSITION OF SWITCH THE D.D.C. CONTROLLER TAKE CHARGE.

No.	DATE	DESCRIPTION
0	Nov-2019	ISSUED FOR TENDER

Date of Issue	November, 2019
Issued To	Client
Issued For	Tender

HVAC

Status: **TENDER**

Building Name: **IT BLOCK CITY CAMPUS**

Drawing Title: **MOTOR CONTROL CENTER**

Designed :	Checked :	Approved :
M.U	M.J	S.Z
Drawn :	Date :	Scale / Sheet :
Z.S	May 2018	N.T.S
Project Code :	00986	Rev. :
0		
Drawing No. :	EA-00986-SIT-M3-02	