Bangladesh Economic Zones Authority (BEZA)
Bangladesh Economic Zones Development Project (Phase-1)
Prime Minister's Office

Monem Business District (Level-12), 111, Bir Uttam C.R. Dutta Road, Dhaka-1205.
Web Site: www.beza.gov.bd

T E N D E R D O C U M E N T
FOR THE PROCUREMENT OF WORKS

Interior works and HVAC system installation for BEZA in Administrative Building in BSMSN

Invitation for Tender No: 01/2020-21
Tender Package No: BEZA WD-1802 B
Issued on: ……

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Section 1. Instructions to Tenderers

A. General

1. Scope of Tender

1.1 The Procuring Entity, as indicated in the Tender Data Sheet (TDS) issues this Tender Document for the procurement of Works and associated Services incidental thereto as specified in the **TDS** and as detailed in **Section 6: Bill of Quantities**. The name of the Tender and the number and identification of its constituent lot(s) are stated in the **TDS**.

1.2 The successful Tenderer shall be required to execute the works and physical services as specified in the General Conditions of Contract

2. Interpretation

2.1 Throughout this Tender Document:

(a) the term "in writing" means communication written by hand or machine duly signed and includes properly authenticated messages by facsimile or electronic mail;

(b) if the context so requires, singular means plural and vice versa;

(c) "day" means calendar days unless otherwise specified as working days;

(d) "Person" means and includes an individual, body of individuals, sole proprietorship, partnership, company, association or cooperative society that wishes to participate in Procurement proceedings;

(e) "Tenderer" means a Person who submits a Tender;

(f) "Tender Document" means the Document provided by a Procuring Entity to a Tenderer as a basis for preparation of the Tender; and

(g) "Tender" depending on the context, means a Tender submitted by a Tenderer for execution of Works and Physical Services to a Procuring Entity in response to an Invitation for Tender.

3. Source of Funds

3.1 The Procuring Entity has been allocated public funds as indicated in the **TDS** and intends to apply a portion of the funds to eligible payments under the Contract for which this Tender Document is issued.

3.2 For the purpose of this provision, "public funds" means any monetary resources appropriated to Procuring Entities under Government budget, or loan, grants and credits placed at the disposal of Procuring Entities through the Government by the Bank or foreign states or organisations.

3.3 Payments by the Bank, if so indicated in the **TDS**, will be made only at the request of the Government and upon approval by the Bank in accordance with the applicable Loan / Credit / Grant Agreement, and will be subject in all respects to the terms and conditions of that Agreement.

4. Corrupt, Fraudulent, Collusive, Coercive or Obstructive Practices

4.1 The Government and the Bank require that Procuring Entities, as well as Tenderers and Contractors (including their suppliers, sub-contractors, agents, personnel, consultants, and service providers) shall observe the highest standard of ethics during implementation of procurement proceedings and the execution of Contracts under public funds.

4.2 For the purposes of ITT Sub Clause 4.3, the terms set forth below as follows:

(a) "corrupt practice" means offering, giving or promising to give, receiving, or soliciting either directly or indirectly, to any officer or employee of a Procuring Entity or other public or private authority or individual, a gratuity in any form; employment or any other thing or service of value as an inducement with respect to an act or decision or method followed by a Procuring Entity in connection with a Procurement proceeding or Contract execution;

(b) "fraudulent practice" means the misrepresentation or omission of facts in order to influence a decision to be taken in a Procurement proceeding or Contract execution;

(c) "collusive practice" means a scheme or arrangement between two (2) or more Persons, with or without the knowledge of the Procuring Entity, that is designed to arbitrarily reduce the number of Tenders submitted or fix Tender prices at artificial, non-competitive levels, thereby denying a Procuring Entity the benefits of competitive price arising from genuine and open competition; or

(d) "coercive practice" means harming or threatening to harm, directly or indirectly, Persons or their property to influence a decision to be taken in the Procurement proceeding or the execution of a Contract, and this will include creating obstructions in the normal submission process used for Tenders.

(e) "obstructive practice" means deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation.

4.3 Should any corrupt, fraudulent, collusive, coercive or obstructive practice of any kind is determined by the Procuring Entity or the Bank, this will be dealt with in accordance with the provisions of the Procurement Guidelines of the Bank as stated in the **TDS** in combination with ITT sub-clause 4.4 and the Procurement Laws.

4.4 If corrupt, fraudulent, collusive, coercive or obstructive practices of any kind is determined against any Tenderer or Contractor (including its suppliers, sub-contractors, agents, personnel, consultants, and service providers) in competing for, or in executing a contract under public fund, the Bank shall :

(a) exclude the concerned Tenderer from further participation in the concerned procurement proceedings;

(b) reject any recommendation for award that had been proposed for that concerned Tenderer;

(c) cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Procuring Entity or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive, or coercive practices during the procurement or the execution of that contract, without the Procuring Entity having taken timely and appropriate action satisfactory to the Bank to remedy the situation; and

(d) sanction the concerned Tenderer or individual, at any time, in accordance with prevailing Bank's sanctions procedures, including by publicly declaring such Tenderer or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Bank-financed contract; and (ii) to be a nominated sub-contractor, consultant, manufacturer or supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract.

4.5 The Tenderer shall be aware of the provisions on corruption, fraudulence, collusion, coercion and obstruction as stated in GCC Clause 39 and 89.1(b)(vii).

4.6 In further pursuance of this policy, Tenderers, suppliers and contractors, and their sub-contractors, agents, personnel, consultants, service providers shall permit the Government and the Bank to inspect any accounts and records and other documents relating to the tender submission and contract performance, and to have them audited by auditors appointed by the Government and/or the Bank.

5. Eligible Tenderers

5.1 A Tenderer, and all partners constituting the Terderer, may have the nationalities of any country except the nationalities specified in the TDS.

5.2 A Tenderer may be a physical or juridical individual or body of individuals, or company, association or any combination of them in the form of a Joint Venture, Consortium or Association (JVCA) invited to take part in public procurement or seeking to be so invited or submitting a Tender in response to an Invitation for Tenders.

5.3 A Government-owned enterprise in Bangladesh may also participate in the Tender if it is legally and financially autonomous, it operates under commercial law, and it is not a dependent agency of the Procuring Entity.

5.4 The Tenderer shall have the legal capacity to enter into the Contract.

5.5 A Tenderer shall not have a conflict of interest. All Tenderers found to have a conflict of interest shall be disqualified. A Tenderer may be considered to have a conflict of interest with one or more parties in this tendering process, if :

(a) they have a controlling partner in common; or

(b) they receive or have received any direct or indirect subsidy from any of them; or

(c) they have the same legal representative for purposes of this Tender; or

(d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Tender of another Tenderer, or influence the decisions of the Procuring Entity regarding this tendering process; or

(e) a Tenderer or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Tender; or

(f) a Tenderer, or any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity as Engineer for the contract.

5.6 The Tenderer in its own name or its other names or also in the case of its Persons in different names, shall not be under a declaration of ineligibility for corrupt, fraudulent, collusive, coercive, or obstructive practices as stated under ITT Clause 4.

5.7 The Tenderer with a poor performance, such as abandoning the works, not completing contracts, or financial failure, or with a consistent history of litigation or arbitration awards against it shall not be eligible to Tender.

5.8 The Tenderer shall not be insolvent, be in receivership, be bankrupt, be in the process of bankruptcy, be not temporarily barred from undertaking business and it shall not be the subject of legal proceedings for any of the foregoing.

5.9 The Tenderer shall have fulfilled its obligations to pay taxes and social security contributions under the provisions of laws and regulations of the country of its origin.

5.10 Tenderers shall provide such evidence of their continued eligibility satisfactory to the Procuring Entity, as the Procuring Entity will reasonably request.

5.11 These requirements for eligibility will extend, as applicable, to each JVCA partner and Subcontractor proposed by the Tenderer.

5.12 A Tenderer is under declaration of ineligibility by the Bank and / or the Procuring Entity in accordance with the above ITT clause 4, or in relation to the Bank's *Guidelines on Preventing and Combating Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants*, shall not be eligible to be awarded a contract.

6. Eligible Materials, Equipment and

6.1 All materials, equipment and associated services to be supplied under the Contract are from eligible sources, unless their origin is from a country specified in the TDS.

Associated Services

6.2 For the purposes of this Clause, "origin" means the place where the Materials and Equipments are mined, grown, cultivated, produced or manufactured or processed, or through manufacturing, processing, or assembly, another commercially recognized new product results that differs substantially in its basic characteristics from its components or the place from which the associated services are supplied.

6.3 The origin of materials and equipment and associated services is distinct from the nationality of the Tenderer.

7. Site Visit

7.1 The Tenderer is advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Tender and entering into a contract for construction of the Works.

7.2 The Tenderer and any of its personnel or agents will be granted permission by the Procuring Entity to enter into its premises and lands for the purpose of such visit, but only upon the express condition that the Tenderer, its personnel, and agents will release and indemnify the Procuring Entity and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

7.3 The Tenderer should ensure that the Procuring Entity is informed of the visit in adequate time to allow it to make appropriate arrangements.

7.4 The costs of visiting the Site shall be at the Tenderer's own expense.

B. Tender Document

8. Tender Document: General

8.1 The Sections comprising the Tender Document are listed below, and should be read in conjunction with any Addendum issued under ITT Clause 11.

- Section 1 Instructions to Tenderers (ITT)
- Section 2 Tender Data Sheet (TDS)
- Section 3 General Conditions of Contract (GCC)
- Section 4 Particular Conditions of Contract (PCC)
- Section 5 Tender and Contract Forms
- Section 6 Bill of Quantities (BOQ)
- Section 7 General Specifications
- Section 8 Particular Specifications
- Section 9 Drawings
- Section 10 Environmental Management Plan

8.2 The Procuring Entity is not responsible for the completeness of the Tender Document and their addenda, if these were not purchased directly from the Procuring Entity, or through its agent(s) as stated in the **TDS.**

8.3 The Tenderer is expected to examine all instructions, forms, terms, and specifications in the Tender Document as well as in addendum to Tender, if any.

9.	Clarification of Tender Document	9.1 A prospective Tenderer requiring any clarification of the Tender Document shall contact the Procuring Entity in writing at the Procuring Entity's address and within time as indicated in the **TDS.**
		9.2 A Procuring Entity is not obliged to answer any clarification request received after that date as stated under ITT Sub Clause 9.1.
		9.3 The Procuring Entity shall respond in writing within five (5) working days of receipt of any such request for clarification received under ITT Sub Clause 9.1.
		9.4 The Procuring Entity shall forward copies of its response to all those who have purchased the Tender Document, including a description of the enquiry but without identifying its source.
		9.5 Should the Procuring Entity deem it necessary to revise the Tender Document as a result of a clarification, it will do so following the procedure under ITT Clause 11 and ITT Sub Clause 42.2.
10.	Pre-Tender Meeting	10.1 To clarify issues and to answer questions on any matter arising in the Tender Document, the Procuring Entity may, if stated in the **TDS**, hold a pre-Tender Meeting at the place, date and time as specified in the **TDS.** All potential Tenderers are encouraged and invited to attend the meeting, if it is held.
		10.2 The Tenderer is requested to submit any questions in writing so as to reach the Procuring Entity no later than one day prior to the date of the meeting.
		10.3 Minutes of the pre-Tender meeting, including the text of the questions raised and the responses given, together with any responses prepared after the meeting, will be transmitted within five (5) working days after holding the meeting to all those who purchased the Tender document and to even those who did not attend the meeting. Any revision to the Tender document listed in ITT Sub-Clause 8.1 that may become necessary as a result of the pre-Tender meeting will be made by the Procuring Entity exclusively through the issue of an Addendum pursuant to ITT Sub Clause 11 and not through the minutes of the Pre-Tender meeting.
		10.4 Non-attendance at the Pre-Tender meeting will not be a cause for disqualification of a Tenderer.
11.	Addendum to Tender Document	11.1 At any time prior to the deadline for submission of Tenders, the Procuring Entity, on its own initiative or in response to an inquiry in writing from a Tenderer, having purchased the Tender Document, or as a result of a Pre-Tender meeting may revise the Tender Document by issuing an Addendum.
		11.2 The Addendum issued under ITT Sub Clause 11.1 shall become an integral part of the Tender Document and shall have a date and an issue number and must be circulated by fax, mail or e-mail, to Tenderers who have purchased the Tender Documents, within five (5) working days.
		11.3 The Tenderers will acknowledge receipt of an Addendum within three (3) working days.
		11.4 Procuring Entities shall also ensure posting of the relevant addenda with the reference number and date on their websites including notice boards,

where the Procuring Entities had originally posted the IFTs.

11.5 To give a prospective Tenderer reasonable time in which to take an addendum into account in preparing its Tender, the Procuring Entity may, at its discretion, extend the deadline for the submission of Tenders, pursuant to ITT Sub Clause 42.2.

11.6 If an addendum is issued when time remaining is less than **one-third** of the time allowed for the preparation of Tenders, a Procuring Entity at its discretion shall extend the deadline by an appropriate number of days for the submission of Tenders, depending upon the nature of the Procurement requirement and the addendum. In any case, the minimum time for such extension shall not be less than three (3) working days.

C. Qualification Criteria

12. General Criteria

12.1 The Tenderer shall possess the necessary professional and technical qualifications and competence, financial resources, equipment and other physical facilities, managerial capability, specific experience, reputation, and the personnel, to perform the contract.

12.2 To qualify for multiple number of contracts/lots in a package made up of this and other individual contracts/lots for which tenders are invited in the Invitation for Tenders, the Tenderer shall demonstrate having resources and experience sufficient to meet the aggregate of the qualifying criteria for the individual contracts.

13. Litigation History

13.1 Litigation history shall comply with the requirement as specified in ITT 15.1(c).

14. Experience Criteria

14.1 The Tenderer shall have the following minimum level of construction experience to qualify for the performance of the Works under the Contract:

(a) a minimum number of years of general experience in the construction of works as Prime Contractor or Subcontractor or Management Contractor as specified in the **TDS**; and

(b) Specific experience as a Prime Contractor or Subcontractor or Management Contractor in construction works of a nature, complexity and methods/construction technology similar to the proposed Works in at least a number of contract(s) and of a minimum value over the period, as specified in the **TDS**.

15. Financial Criteria

15.1 The Tenderer shall have the following minimum level of financial capacity to qualify for the performance of the Works under the Contract.

(a) the average annual **construction** turnover as specified in the **TDS** during the period specified in the **TDS**;

(b) availability of minimum liquid assets or working capital or credit facilities, as specified in the **TDS**; and

(c) satisfactory resolution of all claims, arbitrations or other litigation cases and shall not have serious negative impact on the financial capacity of the Tenderer.

16. Personnel Capacity

16.1 The Tenderer shall have the following minimum level of personnel capacity to qualify for the performance of the Works under the Contract:

(a) a Construction Project Manager, Engineers, and other key staff with qualifications and experience as specified in the **TDS**;

17.Equipment Capacity

17.1 The Tenderer shall own suitable equipment and other physical facilities or have proven access through contractual arrangement to hire or lease such equipment or facilities for the desired period, where necessary or have assured access through lease, hire, or other such method, of the essential equipment, in full working order, as specified in the **TDS**.

18. Joint Venture, Consortium or Association (JVCA)

18.1 The Tenderer may participate in the procurement proceedings forming a Joint Venture, Consortium or Associations (JVCA) by an agreement, executed case by case on a non judicial stamp of value as stated in **TDS** or alternately with the intent to enter into such an agreement supported by a Letter of Intent along with the proposed agreement duly signed by all partners of the intended JVCA and authenticated by a Notary Public .

18.2 The figures for each of the partners of a JVCA shall be added together to determine the Tenderer's compliance with the minimum qualifying criteria; however, for a JVCA to qualify, lead partner and its other partners must meet the criteria stated in the **TDS.** Failure to comply with these requirements will result in rejection of the JVCA Tender. Subcontractors' experience and resources will not be taken into account in determining the Tenderer's compliance with the qualifying criteria.

18.3 Each partner of the JVCA shall be jointly and severally liable for the execution of the Contract, all liabilities and ethical and legal obligations in accordance with the Contract terms.

18.4 The JVCA shall nominate a Representative (partner-in-charge) who shall have the authority to conduct all business for and on behalf of any and all the partners of the JVCA during the tendering process and, in the event the JVCA is awarded the Contract, during contract execution including the receipt of payments for and on behalf of the JVCA.

18.5 Each partner of the JVCA shall complete the JVCA Partner Information (**Form PW3-3)** for submission with the Tender.

19. Subcontractor(s)

19.1 A Tenderer may intend to subcontract an activity or part of the Works, in which case such elements and the proposed Subcontractor shall be clearly identified.

19.2 The Procuring Entity may require Tenderers to provide more information about their subcontracting arrangements. If any Subcontractor is found ineligible or unsuitable to carry out the subcontracted tasks, the Procuring Entity may request the Tenderer to propose an acceptable substitute.

19.3 The Procuring Entity may also select nominated Subcontractor(s) to execute certain specific components of the Works and if so, those will be specified in the **TDS**.

19.4 The successful Tenderer shall under no circumstances assign the Works or any part of it to a Subcontractor.

19.5 Each Subcontractor shall complete the Subcontractor Information (**Form PW3-4**) for submission with the Tender.

D. Tender Preparation

20. Only one Tender

20.1 A Tenderer shall submit only one (1) Tender for each lot, either individually or as a JVCA. The Tenderer who submits or participates in more than one (1) Tender in one (1) lot will cause all the Tenders of that particular Tenderer to be rejected.

21.Cost of Tendering

21.1 The Tenderer shall bear all costs associated with the preparation and submission of its Tender, and the Procuring Entity shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process.

22. Issuance and Sale of Tender Document

22.1 A Procuring Entity shall make Tender Documents available immediately to the potential Tenderers, requesting and willing to purchase at the corresponding price if the advertisement has been published in the newspaper.

22.2 There shall not be any pre-conditions whatsoever, for sale of Tender Documents and the sale of such Document shall be permitted up to the day prior to the day of deadline for the submission of Tender.

23. Language of Tender

23.1 The Tender shall be written in the English language. Correspondences and documents relating to the Tender may be written in English or *Bangla.* Supporting documents and printed literature furnished by the Tenderer that are part of the Tender may be in another language, provided they are accompanied by an accurate translation of the relevant passages in the English or *Bangla* language, in which case, for purposes of interpretation of the Tender, such translation shall govern.

23.2 The Tenderer shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.

24. Contents of Tender

24.1 The Tender prepared by the Tenderer will comprise the following:

(a) the Tender Submission Letter in accordance with ITT Clause 25 (**Form PW3-1**);

(b) Tenderer Information in accordance with ITT Clauses 5, 29 and 32 (**Form PW3-2**);

(c) the priced Bill of Quantities for each lot in accordance with ITT Clauses 25,27 and 28;

(d) Tender Security as stated under ITT Clauses 35, 36 and 37.

(e) alternatives, if permissible, as stated under ITT Clause 26;

(f) written confirmation authorizing the signatory of the Tender to commit the Tenderer, as stated under ITT Sub Clause 40.3;

(g) Valid Trade license ;

(h) documentary evidence of Tax Identification Number (TIN) and Value Added Tax (VAT) as a proof of taxation obligations as stated under ITT Sub Clause 5.9;

(i) documentary evidence as stated under ITT Clause 29 establishing the Tenderer's qualifications to perform the Contract if its tender is accepted;

(j) Technical Proposal describing work plan & method, personnel, equipment and schedules as stated under ITT Clause 31;

(k) documentary evidence as stated under ITT Clause 32 establishing the

minimum qualifications of the Tenderer required to be met for due performance of the Works and physical services under the Contract; and

(l) any other document as specified in the **TDS**.

24.2 In addition to the requirements stated under ITT Sub Clause 24.1, Tenders submitted by a JVCA or proposing a Subcontractor shall include:

(a) a Joint Venture Agreement entered into by all partners, executed on a non-judicial stamp of value or equivalent as stated under ITT Sub Clause 18.1; or

(b) a Letter of Intent along with the proposed agreement duly signed by all partners of the intended JVCA with the declaration that it will execute the Joint Venture agreement in the event the Tenderer is successful;

(c) the JVCA Partner Information (**Form PW3-3**);

(d) the Subcontractor Information (**Form PW3-4**).

25. Tender Submission Letter and Bill of Quantities

25.1 The Tenderer shall submit the Tender Submission Letter (**Form PW3-1**), which shall be completed without any alterations to its format, filling in all blank spaces with the information requested, failing which the Tender may be rejected as being incomplete.

25.2 The Tenderer shall submit the priced Bill of Quantities using the form(s) furnished in **Section 6: Bill of Quantities.**

25.3 If in preparing its Tender, the Tenderer has made errors in the unit rate or price or the total price, and wishes to correct such errors prior to submission of its Tender, it may do so, but shall ensure that each correction is initialled by the authorised person of the Tenderer.

26. Alternatives

26.1 Unless otherwise stated in the **TDS**, alternatives shall not be considered.

26.2 When alternative times for completion are explicitly invited, a statement to that effect will be included in the **TDS**, as will the method of evaluating different times for completion.

26.3 Except as provided under ITT Sub Clause 26.4, Tenderers wishing to offer technical alternatives to the requirements of the Tender Documents **must first price** the Procuring Entity's design as described in the Tender Documents and shall further provide all information necessary for a complete evaluation of the alternative by the Procuring Entity, including drawings, designs, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details.

26.4 When specified in the **TDS**, Tenderers are permitted to submit alternative technical solutions for specified parts of the Works, and such parts will be identified in the **TDS**.

26.5 Only the technical alternatives, if any, of the lowest evaluated Tenderer conforming to the basic technical requirements will be considered by the Procuring Entity.

27. Tender Prices, Discounts and Price Adjustment

27.1 The prices and discounts quoted by the Tenderer in the Tender Submission Letter (**Form PW3-1**) and in the Bill of Quantities (BOQ) shall conform to the requirements specified below.

27.2 The Tenderer shall fill in unit rates or prices for all items of the Works both in figures and in words as described in the BOQ.

27.3 The items quantified in the BOQ for which no unit rates or prices have been quoted by the Tenderer will not be paid for, by the Procuring Entity when executed and shall be deemed covered by the amounts of other rates or prices in the BOQ and, it shall not be a reason to change the Tender price.

27.4 The Procuring Entity may, if necessary, require the Tenderer to submit the detail breakdown of the unit rates or prices quoted by the Tenderer for the facilitation of the Tender proceedings.

27.5 The price to be quoted in the Tender Submission Letter, as stated under ITT Sub Clause 25.1, shall be the total price of the Tender, excluding any discounts offered**.**

27.6 The Tenderer shall quote any unconditional discounts and the methodology for application of discount in the Tender Submission Letter as stated under ITT Sub Clause 25.1.

27.7 Tenderers wishing to offer any price reduction for the award of more than one lot shall specify in their Tender the price reductions applicable to each lot, or alternatively, to any combination of lots within the package. Price reductions or discounts will be submitted as stated under ITT Sub Clause 27.1, provided the Tenders for all lots are submitted and opened together.

27.8 All applicable taxes, custom duties, VAT and other levies payable by the Contractor under the Contract, or for any other causes, as of the date twenty-eight (28) days prior to the deadline for submission of Tenders, shall be included in the unit rates and prices and the total Tender price submitted by the Tenderer.

27.9 Unless otherwise provided in the **TDS** and the Contract, the price of a Contract shall be fixed in which case the unit rates or prices may not be modified in response to changes in economic or commercial conditions.

27.10 If so indicated under ITT Sub Clause 27.9, Tenders are being invited with a provision for price adjustments. The unit rates or prices quoted by the Tenderer are subject to adjustment during the performance of the Contract in accordance with the provisions of GCC Clause 71 and, in such case the Procuring Entity shall provide the indexes and weightings or coefficients in **Appendix to the Tender** for the price adjustment formulae specified in the PCC.

27.11 The Procuring Entity may require the Tenderer to justify its proposed indexes, if any of those as stated under ITT Sub Clause 27.10, are instructed to be quoted by the Tenderer in **Appendix to the Tender**.

28. Tender Currency

28.1 The Tenderer shall quote all prices in the Tender Submission Letter and in the Bill of Quantities in Bangladesh Taka currency unless otherwise specified in the **TDS**.

29.Documents Establishing Eligibility of the Tenderer

29.1 A Tenderer, if applying as a sole Tenderer, shall submit documentary evidence to establish its eligibility as stated under ITT Clause 5 and, in particular, it shall:

(a) complete the eligibility declarations in the Tender Submission Letter (**Form PW3-1**);

(b) complete the Tenderer Information (**Form PW3-2**);

(c) provide completed Subcontractor Information (**Form PW3-4**), if it intends to engage any Subcontractor(s).

29.2 A Tenderer, if applying as a partner of an existing or intended JVCA shall submit documentary evidence to establish its eligibility as stated under

ITT Clause 5 and, in particular, in addition to as specified in ITT Sub Clause 29.1, it shall:

(a) provide for each JVCA partner, completed JVCA Partner Information (**Form PW3-3**);

(b) provide the JVCA agreement or Letter of Intent along with the proposed agreement of the intended JVCA as stated in ITT Sub Clause 18.1.

30. Documents Establishing the Eligibility and Conformity of Materials, Equipment and Services

30.1 The Tenderer shall submit documentary evidence to establish the origin of all Materials, Equipment and services to be supplied under the Contract as stated under ITT Clause 6.

30.2 To establish the conformity of the Materials, Equipment and services to be supplied under the Contract, the Tenderer shall furnish, as part of its Tender, the documentary evidence (which may be in the form of literature, specifications and brochures, drawings or data) that these conform to the technical specifications and standards specified in **Section 7, General Specifications** and **Section 8, Particular Specifications.**

31. Documents Establishing Technical Proposal

31.1 The Tenderer shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in **TDS**, in sufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the work requirements and the completion time.

32. Documents Establishing the Tenderer's Qualification

32.1 Tenderers shall complete and submit the Tenderer Information (**Form PW3-2**) and shall include documentary evidence, as applicable to satisfy the following:

(a) general experience of construction works as stated under ITT Sub Clause 14.1(a) ;

(b) specific experience in construction works of similar nature and size as stated under ITT Sub Clauses 14.1(b)

(c) average annual **construction** turnover for a period as stated under ITT Sub Clause 15.1(a);

(d) adequacy of working capital for this Contract i.e. access to line(s) of credit and availability of other financialresourcesas stated under ITT Sub Clause 15.1(b);

(e) technical and administrative personnel along with their qualification and experience proposed for the Contract as stated under ITT Clause 16;

(f) major items of construction equipment proposed to carry out the Contract as stated under ITT Clause 17;

(g) authority to seek references from the Tenderer's bankers or any other sources.

(h) information regarding any litigation, current or during the last five years, in which the Tenderer is involved, the parties concerned, and disputed amount;

(i) reports on the financial standing of the Tenderer, such as profit and loss statements and auditor's reports for the past five years.

32.2 A Procuring Entity shall disqualify a Tenderer who submits a document containing false information for purposes of qualification or mislead or makes false representations in proof of qualification requirements. A

Procuring Entity may declare such a Tenderer ineligible, either indefinitely or for a stated period of time, from participation in future procurement proceedings

32.3 A Procuring Entity may disqualify a Tenderer if it finds at any time that the information submitted concerning the qualifications of the Tenderer was materially inaccurate or materially incomplete. Also, a Procuring Entity may disqualify a Tenderer who has record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays, litigation history or financial failures.

33. Validity Period of Tender

33.1 Tenders shall remain valid for the period specified in the **TDS** after the date of Tender submission deadline prescribed by the Procuring Entity.. A Tender valid for a period shorter than that specified will be rejected by the Procuring Entity as non- responsive.

34. Extension of Tender Validity and Tender Security

34.1 In exceptional circumstances, prior to the expiration of the Tender validity period, the Procuring Entity may solicit the Tenderers' consent to an extension of the period of validity of their Tenders.

34.2 The request and the responses shall be made in writing. Validity of the tender security provided under ITT Clause 35 shall also be suitably extended for twenty eight (28) days beyond the new date for the expiry of the Tender Validity. If a Tenderer does not respond or refuses the request it shall not forfeit its tender security, but its tender shall no longer be considered in the evaluation proceedings. A Tenderer agreeing to the request will not be required or permitted to modify its tender.

35. Tender Security

35.1 The Tenderer shall furnish as part of its Tender, in favour of the Procuring Entity or as otherwise directed on account of the Tenderer, a Tender Security in original form and in the amount, as specified in the **TDS**.

35.2 If the Tender is a Joint Venture, the Tenderer shall furnish as part of its Tender, in favour of the Procuring Entity or as otherwise directed on account of the title of the existing or intended JVCA or any of the partners of that JVCA or in the names of all future partners as named in the Letter of Intent of the JVCA, a Tender Security in original form and in the amount as stated under ITT Sub Clause 35.2.

36. Form of Tender Security

36.1 The Tender Security shall:

(a) at the Tenderer's option, be either;

i. in the form of a bank draft or pay order, or

ii. in the form of an irrevocable bank guarantee issued by a scheduled Bank of Bangladesh, in the format (**Form PW3-6**) furnished in **Section 5: Tender and Contract Forms**;

(b) be payable promptly upon written demand by the Procuring Entity in the case of the conditions listed in ITT Sub Clause 39 being invoked; and

(c) remain valid for at least twenty eight (28) days beyond the expiry date of the Tender Validity in order to make a claim in due course against a Tenderer in the circumstances as stated under ITT Sub Clause 39.1.

37. Authenticity of Tender Security

37.1 The authenticity of the Tender Security submitted by a Tenderer may be examined and verified by the Procuring Entity at its discretion in writing from the Bank issuing the security.

37.2 If a Tender Security is found to be not authentic, the Procuring Entity may proceed to take measures against that Tenderer as stated under ITT Sub Clause 4.4.

37.3 A Tender not accompanied by a valid Tender Security will be rejected by the Procuring Entity.

38. Return of Tender Security

38.1 No Tender Securities shall be returned by the Tender Opening Committee (TOC) during and after the opening of the Tenders.

38.2 No Tender Security shall be returned to the Tenderers before contract signing, except to those who are found unsuccessful.

38.3 Unsuccessful Tenderer's tender security will be discharged or returned as soon as possible but within 28 days of the end of the tender validity period specified in ITT Sub-Clauses 33.1.

38.4 The tender security of the Successful Tenderer will be discharged upon the Tenderer's furnishing of the performance security pursuant to ITT Clause 33 and signing the Agreement.

39. Forfeiture of Tender Security

39.1 The Tender Security may be forfeited, if a Tenderer:

(a) withdraws its Tender after opening of Tenders but within the validity of the Tender as stated under ITT Clause 33 and 34; or

(b) refuses to accept a Notification of Award as stated under ITT Sub Clause 63.1; or

(c) fails to furnish Performance Security as stated under ITT Sub Clause 64.1 and 64.2; or

(d) refuses to sign the Contract as stated under ITT Sub Clause 69.2 ; or

(e) does not accept the correction of the Tender price following the correction of the arithmetic errors as stated under ITT Clause 55.

40. Format and Signing of Tender

40.1 The Tenderer shall prepare one (1) original of the documents comprising the Tender as described in ITT Clause 24 and clearly mark it "ORIGINAL." In addition, the Tenderer shall prepare the number of copies of the Tender, as specified in the **TDS** and clearly mark each of them "COPY." In the event of any discrepancy between the original and the copies, the ORIGINAL shall prevail.

40.2 Alternatives, if permitted in accordance with ITT Clause 26, shall be clearly marked "Alternative".

40.3 The original and each copy of the Tender shall be typed or written in indelible ink and shall be signed by the Person duly authorized to sign on behalf of the Tenderer. This authorization shall be attached to the Tender Submission Letter (**Form PW3-1**). The name and position held by each Person(s) signing the authorization must be typed or printed below the signature. All pages of the original and of each copy of the Tender, except

for un-amended printed literature, shall be numbered sequentially and signed or initialled by the person signing the Tender.

40.4 Any interlineations, erasures, or overwriting will be valid only if they are signed or initialled by the Person(s) signing the Tender.

E. Tender Submission

41. Sealing, Marking and Submission of Tender

41.1 The Tenderer shall enclose the original in one (1) envelope and all the copies of the Tender, including the alternatives, if permitted under ITT Clause 26, in another envelope, duly marking the envelopes as "ORIGINAL" "ALTERNATIVE" (if permitted) and "COPY." These sealed envelopes will then be enclosed and sealed in one (1) single outer envelope.

41.2 The inner and outer envelopes shall:

(a) be addressed to the Procuring Entity at the address as stated under ITT Sub Clause 42.1;

(b) bear the name of the Tender and the Tender Number as stated under ITT Sub Clause 1.1;

(c) bear the name and address of the Tenderer;

(d) bear a statement "DO NOT OPEN BEFORE ----------" the time and date for Tender opening as stated under ITT Sub Clause 48.2;

(e) bear any additional identification marks as specified in the **TDS**.

41.3 The Tenderer is solely and entirely responsible for pre-disclosure of Tender information if the envelope(s) are not properly sealed and marked.

41.4 Tenders shall be delivered by hand or by mail, including courier services at the address(s) as stated under ITT Sub Clause 42.1.

41.5 The Procuring Entity will, on request, provide the Tenderer with acknowledgement of receipt showing the date and time when it's Tender was received.

42. Deadline for Submission of Tender

42.1 Tenders shall be delivered to the Procuring Entity at the address specified in the **TDS** and no later than the date and time specified in the **TDS**.

42.2 The Procuring Entity may, at its discretion,, extend the deadline for submission of Tender as stated under ITT Sub Clause 42.1, in which case all rights and obligations of the Procuring Entity and Tenderers previously subject to the deadline will thereafter be subject to the new deadline as extended.

42.3 The submission of Tenders will not be allowed in more than one place.

43. Late Tender

43.1 Any Tender received by the Procuring Entity after the deadline for submission of Tenders as stated under ITT Sub Clause 42.1 shall be declared LATE, rejected, and returned unopened to the Tenderer.

44. Notice for Modification, Substitution or

44.1 A Tenderer may modify, substitute or withdraw its Tender after it has been submitted by sending a written notice duly signed by the authorized signatory and properly sealed, and shall include a copy of the

Withdrawal of Tender		authorization ; provided that such written notice including the affidavit is received by the Procuring Entity prior to the deadline for submission of Tenders as stated under ITT Clause 42.
45. Tender Modification	45.1	The Tenderer shall not be allowed to retrieve its original Tender, but shall be allowed to submit corresponding modification to its original Tender marked as "**MODIFICATION".**
46. Tender Substitution	46.1	The Tenderer shall not be allowed to retrieve its original Tender, but shall be allowed to submit another Tender marked as **"SUBSTITUTION".**
47. Tender Withdrawal	47.1	The Tenderer shall be allowed to withdraw its Tender by a Letter of Withdrawal marked as **"WITHDRAWAL".**

F. Tender Opening and Evaluation

48. Tender Opening

48.1 Tenders shall be opened in one location, immediately, but no later than one hour, after the deadline for submission of Tenders at the place as specified in the TDS.

48.2 Persons not associated with the Tender may not be allowed to attend the public opening of Tenders.

48.3 The Tenderers' representatives shall be duly authorised by the Tenderer. Tenderers or their authorised representatives will be allowed to attend and witness the opening of Tenders, and will sign a register evidencing their attendance.

48.4 The authenticity of withdrawal or substitution of, or modifications to original Tender, if any made by a Tenderer in specified manner, shall be examined and verified by the Tender Opening Committee (TOC) based on documents submitted as stated under ITT Sub Clause 44.1.

48.5 Tenders will be opened in the following manner:

(a) First, envelopes marked "Withdrawal" shall be opened and read out and the envelope with the corresponding tender shall not be opened, but returned to the Tenderer. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at tender opening. Next, envelopes marked "Substitution" shall be opened and read out and exchanged with the corresponding tender being substituted, and the substituted tender shall not be opened, but returned to the Tenderer. No Tender substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at tender opening. Envelopes marked "Modification" shall be opened and read out with the corresponding tender. No tender modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at tender opening. Only envelopes that are opened and read out at tender opening shall be considered further.

(b) secondly, the remaining Tenders will be sorted out and those marked "Substitution" or "Modification" will be linked with their

corresponding "Original"(O) Tender;

(c) thirdly, if so specified in this Tender Document, the envelopes marked " Alternative "(A) shall be opened and read aloud with the corresponding Tender and recorded.

48.6 Ensuring that only the correct (M), (S), (A), (O) envelopes are opened, details of each Tender will be dealt with as follows:

(a) the Chairperson of the Tender Opening Committee will read aloud each Tender and record in the Tender Opening Sheet (TOS) :

(i) the name and address of the Tenderer;

(ii) state if it is a withdrawn, modified, substituted or original Tender;

(iii) the Tender price;

(iv) any discounts;

(v) any alternatives;

(vi) the presence or absence of any requisite Tender Security; and

(vii) such other details as the Procuring Entity, at its discretion, may consider appropriate.

(b) only discounts and alternatives read aloud at the Tender opening will be considered in evaluation.

(c) all pages of the original version of the Tender, except for un-amended printed literature, will be initialled by members of the Tender Opening Committee.

48.7 Upon completion of Tender opening, all members of the Tender Opening Committee and the Tenderers or Tenderer's duly authorised representatives attending the Tender opening shall sign by name, address, designation, the Tender Opening Sheet, copies of which shall be issued to the Head of the Procuring Entity or an officer authorised by him or her and also to the members of the Tender Opening Committee and any authorised Consultants and, to the Tenderers immediately.

48.9 The omission of a Tenderer's signature on the record shall not invalidate the contents and effect of the record under ITT Sub Clause 48.7.

48.10 No Tender will be rejected at the Tender opening stage except the LATE Tenders as stated in the ITT Clause 43.

49. Evaluation of Tenders

49.1 Tenders shall be examined and evaluated only on the basis of the criteria specified in the Tender Document.

49.2 The Procuring Entity's **Tender Evaluation Committee** (**TEC**) shall examine, evaluate and compare Tenders that are substantially responsive to the requirements of Tender Documents in order to identify the successful Tenderer.

50. Evaluation Process

50.1 The TEC will consider a Tender responsive that conforms in all respects to the requirements of the Tender Document without material deviation, reservation, or omission.The evaluation process should

begin immediately after tender opening, following four broad steps:

(a) Preliminary examination

(b) Technical examination and responsiveness

(c) Financial evaluation and price comparison

(d) Post-qualification of the Tender.

51. Preliminary Examination

51.1 The Procuring Entity shall examine the tenders to confirm that all documentation requested in ITT Clause 24 has been provided, to determine the completeness of each document submitted .

51.2 The Procuring Entity shall confirm that the following documents and information have been provided in the tender. If any of these documents or information is missing, the offer shall be rejected.

(a) Tender Submission Letter;

(b) Priced Bill of Quantities;

(c) Written confirmation of authorization to commit the Tenderer; and

(d) Tender Security.

52. Technical Responsiveness and Technical Evaluation

52.1 The Procuring Entity's determination of a tender's responsiveness is to be based on the contents of the tender itself without recourse to extrinsic evidence.

52.2 A substantially responsive tender is one that conforms in all respects to the requirements of the Tender Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that:

(a) affects in any substantial way the scope, quality, or performance of the Works specified in the Contract; or

(b) limits in any substantial way, or is inconsistent with the Tender Documents, the Procuring Entity's rights or the Tenderer's obligations under the Contract; or

(c) if rectified would unfairly affect the competitive position of other Tenderers presenting substantially responsive tenders.

52.3 If a tender is not substantially responsive to the Tender Document, it shall be rejected by the Procuring Entity and shall not subsequently be made responsive by the Tenderer by correction of the material deviation, reservation, or omission.

52.4 There shall be no requirement as to the minimum number of responsive tenders.

52.5 There shall be no automatic exclusion of tenders which are above or below the official estimate.

52.6 The Procuring Entity shall now examine the tender to confirm that all terms and conditions specified in the GCC and the PCC have been accepted by the Tenderer without any material deviation or reservation.

52.7 The Procuring Entity shall evaluate the technical aspects of the tender submitted in accordance with ITT Clauses 30,31 and 32, to confirm that all requirements specified in Section 7: General Specifications and Section 8: Particular Specifications of the Tender Document have been

met without any material deviation or reservation.

52.8 If, after the examination of the terms and conditions and the technical aspects of the tender, the Procuring Entity determines that the tender is not substantially responsive in accordance with ITT Sub-Clauses 52.6 and 52.7 , it shall reject the tender.

52.9 Provided that a tender is substantially responsive, the Procuring Entity may request that the Tenderer submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the tender related to documentation requirements. Such omission shall not be related to any aspect of the rates of the tender reflected in the Priced Bill of Quantities. Failure of the Tenderer to comply with the request may result in the rejection of its tender.

52.10 The TEC may regard a Tender as responsive even if it contains;

(a) minor or insignificant deviations which do not meaningfully alter or depart from the technical specifications, characteristics and commercial terms and, conditions or other mandatory requirements set out in the Tender Document; or

(b) errors or oversights, that if corrected, would not alter the key aspects of the Tender.

53. Clarification on Tender

53.1 The TEC may ask Tenderers for clarification of their Tenders, including information which are historical in nature or breakdowns of unit rates or prices, in order to facilitate the examination and evaluation of Tenders. The request for clarification by the TEC and the response from the Tenderer shall be in writing, and Tender clarifications which may lead to a change in the substance of the Tender or in any of the key elements of the Tender pursuant to ITT Sub Clause 52.2, will neither be sought nor be permitted.

53.2 Changes in the Tender price shall also not be sought or permitted, except to confirm the correction of arithmetical errors discovered by the TEC in the evaluation of the Tenders, as stated under ITT Sub Clause 55.1.

54. Restrictions on Disclosure of Information

54.1 After the opening of tenders, information relating to the examination, clarification, and evaluation of tenders and recommendations for award shall not be disclosed to tenderers or other persons not officially concerned with the evaluation process until the award of the contract is announced.

54.2 Any effort by a Tenderer to influence a Procuring Entity in its decision concerning the evaluation of Tenders, Contract awards may result in the rejection of its Tender as well as further action in accordance with Section 64 (5) of the Public Procurement Act, 2006.

55. Correction of Arithmetical Errors

55.1 Provided that the Tender is substantially responsive, the TEC shall correct arithmetical errors on the following basis:

(a) if there is a discrepancy between the unit price and the line item total price that is obtained by multiplying the unit price and quantity, the unit price will prevail and the line item total price

shall be corrected, unless in the opinion of the TEC there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted will govern and the unit price will be corrected; and

(b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) if there is a discrepancy between words and figures, the unit price in words will prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

55.2 If the Tenderer determined to be the lowest evaluated tenderer does not accept the correction of errors, its tender shall be disqualified and its tender security may be forfeited.

56. Financial Evaluation

56.1 The TEC will evaluate each Tender that has been determined, up to this stage of the evaluation, to be substantially responsive to the requirements set out in the Tender Document.

56.2 To evaluate a Tender, the TEC will consider the following:

(a) the Tender price, excluding Provisional Sums and the provision, if any, for contingencies in the priced Bill of Quantities, but including Daywork items, where priced competitively;

(b) adjustments for correction of arithmetical errors pursuant to ITT Sub Clause 55.1;

(c) adjustments in order to take into consideration the unconditional discounts or methodology for application of the discount offered pursuant to ITT Sub Clause 27.7;

(d) adjustments for any other acceptable variations or deviations pursuant to ITT Sub Clause 52.10.

56.3 Variations, deviations, alternatives and other factors which are in excess of the requirements of the Tender Document or otherwise result in unsolicited benefits for the Procuring Entity will not be taken into account in Tender evaluation.

56.4 The estimated effect of any price adjustment provisions under GCC Clause 71, applied over the period of execution of the Contract, will not be taken into account in Tender evaluation.

56.5 If so indicated in the ITT Sub Clause 1.1 the Procuring Entity may award one or multiple lots to one Tenderer following the methodology specified in ITT Sub Clause 56.6.

56.6 To determine the lowest-evaluated lot or combination of lots, the TEC will take into account:

(a) the experience and resources sufficient to meet the aggregate of the qualifying criteria for the individual lot;

(b) the lowest-evaluated Tender for each lot calculated in accordance with all the requirements of Evaluation Criteria;

(c) the price reduction on account of discount per lot or combination of lots and the methodology for application of the discount as offered by the Tenderer in its Tender; and

(d) the Contract-award sequence that provides the optimum economic combination on the basis of least overall cost of the total Contract package taking into account any limitations due to constraints in Works or execution capacity determined in accordance with the post-qualification criteria stated under ITT Clause 59.

56.7 If the tender, which results in the lowest evaluated Tender Price, is Substantially below the updated official estimate or seriously unbalanced as a result of front loading in the opinion of the Procuring Entity, the Procuring Entity may require the Tenderer to produce details price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated Contract payments, the Procuring Entity may require that the amount of the performance security set forth in ITT Clause 64 be increased at the expenses of the Tenderer to a level sufficient to protect the Procuring Entity against financial loss in the event of default of the successful Tenderer under the Contract.

57. Price Comparison

57.1 The TEC will compare all substantially responsive Tenders to determine the lowest-evaluated Tender, in accordance with ITT Clause 56.

57.2 In the extremely unlikely event that there is a tie for the lowest evaluated price, the Tenderer with the superior past performance with the Procuring Entity shall be selected, whereby factors such as delivery period, quality of Works delivered, complaints history and performance indicators could be taken into consideration.

57.3 In the event that there is a tie for the lowest price and none of the Tenderers has the record of past performance with the Procuring Entity as stated under ITT Sub Clause 57.2, then the Tenderer shall be selected, subject to firm confirmation through the Post-qualification process, after consideration as to whether the Tenderer has demonstrated in its Tender superior past performance with the other Procuring Entities or a more efficient work programme and work methodology.

57.4 The successful Tenderer as stated under ITT Sub Clauses 57.1, 57.2 and 57.3 shall not be selected through **lottery** under any circumstances.

58. Negotiations

58.1 No negotiations shall be held during the Tender evaluation or award with the lowest or any other Tenderer.

58.2 The Procuring Entity through the TEC may, however, negotiate with the lowest evaluated Tenderer with the objective to reduce the Contract price by reducing the scope of works or a reallocation of risks and responsibilities, only when it is found that the lowest evaluated Tender is significantly higher than the official estimate; the reasons for such higher price being duly analyzed.

58.3 If the Procuring Entity decides to negotiate for reducing the scope of the requirements under ITT Sub Clause 58.2, it will be required to guarantee that the lowest Tenderer remains the lowest Tenderer even after the scope of work has been revised and shall further be ensured that the objective of the Procurement will not be seriously affected through this reduction.

58.4 In the event that the Procuring Entity decides because of a high Tender price to reduce the scope of the requirements to meet the available budget, the Tenderer is not obliged to accept the award and shall not be penalised in any way for rejecting the proposed award.

59. Post-qualification

59.1 The Procuring Entity shall determine to its satisfaction whether the Tenderer that is selected as having submitted the lowest evaluated and substantially responsive tender is qualified to perform the Contract satisfactorily.

59.2 The determination shall be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, pursuant to ITT Clause 32, clarifications in accordance with ITT Clause 53 and the qualification criteria indicated in ITT Clauses 12 to 17. Factors not included therein shall not be used in the evaluation of the Tenderer's qualification.

59.3 An affirmative determination shall be a prerequisite for award of the Contract to the Tenderer. A negative determination shall result in rejection of the Tenderer's Tender, in which event the Procuring Entity shall proceed to the next lowest evaluated tender to make a similar determination of that Tenderer's capabilities to perform satisfactorily

59.4 The TEC may verify information contained in the Tender by visiting the premises of the Tenderer as a part of the post qualification process, if practical and appropriate.

60. Procuring Entity's Right to Accept any or to Reject Any or All Tenders

60.1 The Procuring Entity reserves the right to accept any tender, to annul the tender proceedings, or to reject any or all tenders at any time prior to contract award, without thereby incurring any liability to Tenderers, or any obligations to inform the Tenderers of the grounds for the Procuring Entity's action.

61. Informing Reasons for Rejection

61.1 Notice of the rejection will be given promptly within seven (7) days of decision taken by the Procuring Entity to all Tenderers and, the Procuring Entity will, upon receipt of a written request, communicate to any Tenderer the reason(s) for its rejection but is not required to justify those reason(s).

G. Contract Award

62. Award Criteria

62.1 The Procuring Entity shall award the Contract to the Tenderer whose offer is responsive to all the requirements of the Tender Document and that has been determined to be the lowest evaluated Tender, provided further that the Tenderer is determined to be Post-qualified in accordance with ITT Clause 59.

62.2 A Tenderer will not be required, as a condition for award, to undertake responsibilities not stipulated in the Tender documents, to change its price, or otherwise to modify its Tender.

63. Notification of Award

63.1 Prior to the expiry of the Tender Validity period and within seven (7) working days of receipt of the approval of the award by the Approving Authority, the Procuring Entity shall issue the Notification of Award (NOA) to the successful Tenderer.

63.2 The Notification of Award, attaching the contract as per the sample (**Form PW3-7**) to be signed, shall state :

(a) the acceptance of the Tender by the Procuring Entity;

(b) the price at which the contract is awarded;

(c) the amount of the Performance Security and its format;

(d) the date and time within which the Performance Security shall be submitted; and

(e) the date and time within which the Contract shall be signed.

63.3 Until a formal contract is signed, the Notification of Award will constitute a Contract, which shall become binding upon the furnishing of a Performance Security and the signing of the Contract by both parties.

64. Performance Security

64.1 The Performance Security shall be provided by the successful Tenderer in the amount as specified in the **TDS** and denominated in the currencies in which the Contract Price is payable.

64.2 The Procuring Entity may increase the amount of the Performance Security above the amounts as stated under ITT Sub Clause 64.1 but not exceeding twenty five (25) percent of the Contract price, if it is found that the Tender is substantially below the updated official estimated or seriously unbalanced as a result of front loading as stated under ITT Sub Clause 56.7.

64.3 The proceeds of the Performance Security shall be payable to the Procuring Entity unconditionally upon first written demand as compensation for any loss resulting from the Contractor's failure to complete its obligations under the Contract.

65. Form and Time Limit for Furnishing of Performance Security

65.1 The Performance Security, as stated under ITT Clause 64, may be in the form of a Bank Draft, Pay Order or an irrevocable Bank Guarantee in the format (**Form PW3-9**), issued by any scheduled Bank of Bangladesh acceptable to the Procuring Entity.

65.2 Within fourteen (14) days from the date of acceptance of the Notification of Award (NOA) but not later than the date specified therein, the successful Tenderer shall furnish the Performance Security for the due performance of the Contract in the amount as stated under ITT Sub Clauses 64.1 or 64.2.

66. Validity of Performance

66.1 The Performance Security shall be required to be valid until a date twenty eight (28) days beyond the Intended Completion Date as

	Security	specified in Tender Document.
67.	Authenticity of Performance Security	67.1 The Procuring Entity may verify the authenticity of the Performance Security submitted by the successful Tenderer by sending a written request to the branch of the bank issuing the Pay Order, Bank Draft or irrevocable Bank Guarantee in specified format.
68.	Adjudicator	68.1 The Procuring Entity proposes the person named in the **TDS** to be appointed as Adjudicator under the Contract, at an hourly fee and for those reimbursable expenses specified in the **TDS**.
		.
69.	Contract Signing	69.1 At the same time as the Procuring Entity issues the Notification of Award (NOA), the Procuring Entity will send the draft Contract Agreement and all documents forming the Contract to the successful Tenderer.
		69.2 Within twenty-one (21) days of receipt of the Agreement, but not later than twenty–eight (28) days of issuance of the NOA, the successful Tenderer shall sign, date, and return it to the Procuring Entity.
		69.3 Failure of the successful Tenderer to submit the Performance Security, pursuant to ITT Sub-Clause 64.1, or sign the Contract, pursuant to ITT Sub-Clause 69.2, shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security. In that event the Procuring Entity may award the Contract to the next lowest evaluated Tenderer, whose offer is substantially responsive and is determined by the Procuring Entity to be qualified to perform the Contract satisfactorily.
70.	Publication of Notification of Award of Contract	70.1 Notification of Awards for Contracts of Taka ten (10) million and above shall be notified by the Procuring Entity to the Central Procurement Technical Unit within seven (7) days of issuance of the NOA for publication in their website, and that notice shall be kept posted for not less than a month.
		70.2 Notification of Award for Contracts below Taka ten (10) million, shall be published by the Procuring Entity on its Notice Board and where applicable on the website of the Procuring Entity and that notice shall be kept posted for not less than a month.
71.	Debriefing of Tenderers	71.1 Debriefing of Tenderers by Procuring Entity shall outline the relative status and weakness only of his or her Tender requesting to be informed of the grounds for not accepting the Tender submitted by him or her, without disclosing information about any other Tenderer.
		71.2 In the case of debriefing, confidentiality of the evaluation process shall be maintained.
72.	Right to Complain	72.1 Any Tenderer has the right to complain in accordance with Section 29 of the Public Procurement Act 2006 and Part 12 of Chapter Three of the Public Procurement Rules, 2008.

Section 2. Tender Data Sheet

Instructions for completing Tender Data Sheet are provided in italics in parenthesis for the relevant ITT clauses	
ITT Clause	**Amendments of, and Supplements to, Clauses in the Instructions to Tenderers**
	A. General
ITT 1.1	The Procuring Entity is Project Director, Bangladesh Economic Zones Development Project (Phase- 1), Monem Business District (Level-12), 111, Bir Uttam C.R. Dutta Road, Dhaka-1205
	The Name of the Tender is: Interior works and HVAC system installation for BEZA in Administrative Building in BSMSN Brief Description of the Works: Interior works and HVAC system installation etc. Tender Ref: 03.07.0000.007.29.229.2020-2610 Lot No(s): 1
ITT 3.1	The source of public funds is International Development Association (IDA)
ITT 3.3	The Bank means IDA
ITT 4.3	Guidelines: Procurement under IBRD Loans and IDA Credits< [under IBRD Loans and IDA Credits & Grants by World Bank Borrowers] January 2011, Revised July 2014 (hereinafter referred to as the Procurement Guidelines)
ITT 5.1	Tenderers from the following countries are not eligible : Israel
ITT 6.1	Materials, Equipments and associated services from the following countries are not eligible: Israel
	B. Tender Document
ITT 8.2	The following are authorised agents of the Procuring Entity for the purpose of issuing the Tender Document: Accounts Officer, Executive Engineer and Project Director Bangladesh Economic Zones Development Project (Phase- 1). Agent's Name: Address: Bangladesh Economic Zones Authority (BEZA) Monem Business District (Level-12), 111, Bir Uttam C.R. Dutta Road, Dhaka-1205 Telephone No.:+880 2 9632459

	Fax No.: e-mail address: bezaproject1@gmail.com
ITT 9.1	For **clarification of Tender Document purposes** only, the Procuring Entity's address is: Attention: Abdullah Al Mahmud Faruk Address: Project Director, Bangladesh Economic Zones Development Project (Phase- 1) Telephone: +880 2 9632459 Fax No.: e-mail address: bezaproject1@gmail.com
ITT 10.1	A Pre- Tender meeting shall be held at Address: Conference room Bangladesh Economic Zones Authority (BEZA) Monem Business District (Level-12), 111, Bir Uttam C.R. Dutta Road, Dhaka-1205. Time & Date: 12.08.2020 at 11:00 am.
C. Qualification Criteria	
ITT 14.1(a)	The minimum number of years of general experience of the Tenderer in the construction works as Prime Contractor or Subcontractor or Management Contractor shall be 5 (Five) years. [*years counting backward from the date of publication of IFT in the newspaper*]
ITT 14.1(b)	The minimum specific experience as a Prime Contractor or Subcontractor or Management Contractor in Interior works/HVAC system installation of at least 1 (one) contract successfully completed within the last 3 (Three) years, each with a value of at least Tk. 1200 (One thousand two hundred) lac. *[years counting backward from the date of publication of IFT in the newspaper]*
ITT 15.1(a)	The required average annual **construction** turnover shall be greater than Tk 1500 (One thousand five hundred) Lac within best 3 (Three) years over the last 5 (Five) years. *[years counting backward from the date of publication of IFT in the newspaper]*

<table>
<tr><td>ITT 15.1(b)</td><td>The minimum amount of liquid assets or working capital or credit facilities of the Tenderer shall be Tk 1200 (One thousand two hundred) Lac.</td></tr>
<tr><td>ITT 16.1(a),</td><td>A Construction Project Manager, Engineer, and other key staff shall have the following qualifications and experience:

<table>
<tr><th>No</th><th>Position</th><th>Total Works Experience (years)</th><th>In Similar Works Experience (years)</th></tr>
<tr><td>1</td><td>Project Manager- B.sc in Civil Engg. -1 Person</td><td>Min. 10 years.</td><td>Min. 5 years.</td></tr>
<tr><td>2</td><td>Alternative Construction Project Manager- B.sc in Civil Engg. -1 Person</td><td>Min. 10 years.</td><td>Min. 5 years.</td></tr>
<tr><td>3</td><td>Field Engineer - B.sc in Civil Engg.- 1 Person</td><td>Min. 7 years.</td><td>Min. 3 years.</td></tr>
<tr><td>4</td><td>Field Engineer - B.sc in EEE -1 Person</td><td>Min. 7 years.</td><td>Min. 3 years.</td></tr>
<tr><td>5</td><td>Field Engineer - B.sc in Architecture -1 Person</td><td>Min. 7 years.</td><td>Min. 3 years.</td></tr>
<tr><td>6</td><td>Quality Control Engineer - B.sc in Civil Engineer -1 Person</td><td>Min. 5 years.</td><td>Min. 3 years</td></tr>
<tr><td>7</td><td>Site Supervisor – (Diploma –in- Civil Engg. – 2 persons</td><td>Min. 10 years.</td><td>Min. 5 years.</td></tr>
<tr><td>8</td><td>Site Supervisor – Diploma –in- Electrical Engg – 1 persons</td><td>Min. 10 years.</td><td>Min. 5 years.</td></tr>
<tr><td>9</td><td>Site Supervisor – Diploma –in- Architecture – 1 persons</td><td>Min. 10 years.</td><td>Min. 5 years.</td></tr>
<tr><td>10</td><td>Surveyor (Certificated in Surveying) -1 Person</td><td>Min. 5 years.</td><td>Min. 3 years</td></tr>
<tr><td>11</td><td>Work Assistant-HSC- 2 Persons</td><td>Min. 5 years.</td><td>Min. 3 years</td></tr>
</table></td></tr>
<tr><td></td><td></td></tr>
<tr><td>ITT 17.1</td><td>The Tenderer shall own or have proven access to hire or lease of the major construction equipments, in full working order as follows :
<table>
<tr><th>Sl No</th><th>Name of Equipment</th><th>Minimum Required (Nos)</th></tr>
<tr><td>1</td><td>Transverse Flange Duct Machine</td><td>1 nos</td></tr>
<tr><td>2</td><td>Duct Forming Machine</td><td>2 nos</td></tr>
<tr><td>3</td><td>Lock Forming Machine</td><td>1 nos</td></tr>
<tr><td>4</td><td>Sheet Cutter Machine</td><td>1 nos</td></tr>
<tr><td>5</td><td>Bender Machine</td><td>1 nos</td></tr>
</table></td></tr>
</table>

6	Automatic Pipe Threading Machine	2 nos
7	Portable PU Spray Machine	1 nos
8	Pipe Jacketing Machine	2 nos
9	Flow Measuring Instruments	1 nos
10	Aluminum Ladder	3 nos
11	Metal Scaffolding	20 nos
12	Electric Welding Machine	2 set
13	Gas welding Cylinder	2 set
14	Nitrogen - Acetylene Cylinder	2 set
15	Digital Thermo-Hygrometer	1 nos
16	Thermo-Anemometer	2 nos
17	Distometer	1 nos
18	Electronic Digital Non-contact Tachometer	1 set
19	Phase Meter	4 set
20	Welding Generator	1 nos
21	Bench Drills	2 set
22	Hammer Drills	5 set
23	AVO Meter	4 nos
24	Gas Welding Set	5 set
25	Vacuum Pump	3 set
26	Chain Pulley & it's Equipment	3 set
27	Electric Disc Cutting Machine	5 set
28	CFM Meter	1 nos
29	Grinding Machine	2 set
30	Pressure Gauge	3 nos
31	Wrench Hammer	2 set
32	Installation tools	2 set

<table>
<tr><td>ITT 18.1</td><td>The value of non-judicial stamp for execution of the Joint Venture agreement shall be Tk 300 (Three Hundred) only.</td></tr>
<tr><td>ITT 18.2</td><td>The minimum qualification requirements of Leading Partner and other Partner(s) of a JVCA shall be as follows :
<table>
<tr><th>TDS Clauses References</th><th>Requirements by summation</th><th>Requirements for Leading Partner</th><th>Requirements for other Partner(s)</th></tr>
<tr><td>ITT-14.1(a)</td><td>Summation not applicable</td><td>Same as stated in TDS</td><td>Same as for Leading Partner</td></tr>
<tr><td>ITT-14.1(b)</td><td>100%</td><td>At least one Contract</td><td>Not applicable</td></tr>
<tr><td>ITT-15.1(a)</td><td>100%</td><td>40%</td><td>25%</td></tr>
<tr><td>ITT-15.1(b)</td><td>100%</td><td>40%</td><td>25%</td></tr>
<tr><td>ITT-16.1(a)</td><td>100%</td><td>No minimum or maximum limit</td><td>No minimum or maximum limit</td></tr>
<tr><td>ITT-17.1</td><td>100%</td><td>No minimum or maximum limit</td><td>No minimum or maximum limit</td></tr>
</table>
[Percent share of business of the JVCA partners shall not be taken into account in determining the qualification of a JVCA]</td></tr>
<tr><td>ITT 19.3</td><td>The Nominated Subcontractor(s) named [insert name(s)] shall execute the following specific components of the proposed Works: None</td></tr>
<tr><td colspan="2">D. Tender Preparation</td></tr>
<tr><td>ITT 24.1 (l)</td><td>The Tenderer shall submit with its Tender the following additional documents: None.</td></tr>
<tr><td>ITT 26.1</td><td>Alternatives will not be permitted.</td></tr>
<tr><td>ITT 26.2</td><td>There shall not be alternative times for completion of the Works.</td></tr>
<tr><td>ITT 26.4</td><td>Alternative technical solutions for any parts of works will not be permitted.</td></tr>
</table>

ITT 27.9	The prices quoted by the Tenderer shall be fixed for the duration of the Contract.
ITT 28.1	The currency of the Tender shall be: Bangladeshi Taka
ITT 31.1	The required Technical Proposal shall include the following additional information: Detailed Method of Construction.
ITT 33.1	The Tender Validity period shall be 120 days.
ITT 35.1	The amount of the Tender Security shall be Tk 50,00,000 (Fifty Lac) in favour of *Project Director, Bangladesh Economic Zones Development Project (Phase- 1), Bangladesh Economic Zones Authority (BEZA).*
ITT 40.1	In addition to the original of the Tender, 02 (Two) copies shall be submitted.
E. Tender Submission	
ITT 41.2(e)	The inner and outer envelopes shall bear the following additional identification marks: BEZA WD-1802 B
ITT 42.1	For **Tender submission purposes** only, the Procuring Entity's address is: Attention: Project Director, Bangladesh Economic Zones Development Project (Phase-1) Address**: Bangladesh Economic Zone Authority (BEZA), Monem Business District (Level-12), 111, Bir Uttam C.R. Dutta Road, Dhaka-1205** The deadline for the submission of Tenders is: Time & Date: 03.09.2020 at 14:00 hours local time.
F. Tender Opening and Evaluation	

ITT 48.1	The Tender opening shall take place at: BEZA Conference room Address: Monem Business District (Level-12), 111, Bir Uttam C.R. Datta Road, Dhaka-1205. Time & Date: 03.09.2020 at 14:30 hours local time.
	G. Contract Award
ITT 64.1	The amount of Performance Security shall be 10 (Ten) percent of the Contract Price.
ITT 68.1	The Adjudicator proposed by the Procuring Entity is President, IEB, Bangladesh. The hourly fee shall be Tk 5000 (Five thousand only). [state amount*]* and the reimbursable expenses shall be limited to Tk 100000 (One lac only). The biographical data of the Adjudicator is: *[provide relevant information, such as education, experience, age, nationality, and present position; attach additional pages as necessary]*

Section 3. General Conditions of Contract	
A. General	
1. Definitions	1.1 In the Conditions of Contract, which include Particular Conditions and these General Conditions, the following words and expressions shall have the meaning hereby assigned to them. Boldface type is used to identify the defined terms: (a) **Act means** The Public Procurement Act, 2006. (b) **Adjudicator** is the expert appointed jointly by the Procuring Entity and the Contractor to resolve disputes in the first instance, as provided for in GCC Sub Clause 94.2. (c) **The Bank** means International Development Association (IDA). (d) **Bill of Quantities (BOQ)** means the priced and completed Bill of Quantities forming part of the Contract defined in GCC Clause 60. (e) **Compensation Events** are those defined in GCC Clause 69. (f) **Approving Authority** means the authority that gives decision on specific issues as per delegation of administrative and/or financial powers. (g) **Completion Certificate** means the Certificate issued by the Project Manager as evidence that the Contractor has executed the Works and Physical services in all respects as per design, drawing, specifications and Conditions of Contract. (h) **Completion Date** is the actual date of completion of the Works and Physical services certified by the Project Manager, in accordance with GCC Clause 80. (i) **Contract** means the Agreement entered into between the Procuring Entity and the Contractor, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein to execute, complete, and maintain the Works. (j) **Contract Documents** means the documents listed in GCC Clause 6, including any amendments thereto. (k) **Contractor** is the party whose Tender to carry out the Works has been accepted by the Procuring Entity. (l) **Contract Price** is the price stated in the Notification of Award and thereafter as adjusted in accordance with the provisions of the Contract. (m) **Contractor's Tender** is the completed Tender Document including the priced Bill of Quantities and the Schedules submitted by the Contractor to the Procuring Entity. (n) **Day** means calendar day unless otherwise specified as

	working days. (o) **Dayworks** means work carried out following the instructions of the Procuring Entity or the authorised Project Manager and is paid for on the basis of time spent by the Contractor's workers and equipment at the rates specified in the Schedules, in addition to payments for associated Materials and Plant. (p) **Defect** is any part of the Works not completed in accordance with the Contract. (q) **Defects Correction Certificate** is the certificate issued by the Project Manager upon correction of defects by the Contractor. (r) **Defects Liability Period** is the period specified in the PCC and calculated from the Completion Date. **Drawings** include calculations and other information provided in Section 9 or as approved by the Project Manager for the execution and completion of the Contract. (s) **Goods** mean the Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate. (a) **Equipment**. is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works. (t) **GCC** means the General Conditions of Contract. (u) **Government** means the Government of the People's Republic of Bangladesh. (v) **"Head of the Procuring Entity"** means the Secretary of a Ministry or a Division, the Head of a Government Department or Directorate; or the Chief Executive, by whatever designation called, of a local Government agency, an autonomous or semi-autonomous body or a corporation, or a corporate body established under the Companies Act; (w) **Intended Completion Date** is the date calculated from the Commencement Date as specified in the **PCC**, on which it is intended that the Contractor shall complete the Works and Physical services as specified in the Contract and may be revised only by the Project Manager by issuing an extension of time or an acceleration order. (x) **Materials** means things of all kinds other than Plant intended to form or forming part of the Works, including the supply-only materials, if any, to be supplied by the Contractor under the Contract. (y) **Month** means calendar month. (z) **Initial Contract Price** is the Contract Price stated in the Procuring Entity's Notification of Award. (aa) **PCC** means the Particular Conditions of Contract.

	(bb) **Plant** means the apparatus, machinery and other equipment intended to form or forming part of the Works, including vehicles purchased for the Procuring Entity and relating to the construction of the Works and Physical services. (cc) **Procuring Entity** is the party who employs the Contractor to carry out the Works, as specified in the PCC. (dd) **Project Manager** is the person named in the **PCC** or any other competent person appointed by the Procuring Entity and notified to the Contractor who is responsible for supervising the execution and completion of the Works and Physical services and administering the Contract. (ee) **Provisional Sums means** amounts of money specified by the Procuring Entity in the Bill of Quantities which shall be used, at its discretion, for payments to Nominated Subcontractor(s) and for meeting other essential expenditures under the Contract pursuant to GCC Sub Clause 77. (ff) **Site** means the places where the Works are to be executed including storage and working areas and to which Plant and Materials are to be delivered, and any other places as may be specified in the **PCC** as forming part of the Site. (gg) **Site Investigation Reports** are those that were included in the Tender Document and are factual and interpretative reports about the surface and subsurface conditions at the Site. (hh) **Specification** means the Specification of the Works included in the Contract and any modifications or additions to the specifications made or approved by the Project Manager in accordance with the Contract. (ii) **Start Date** is the date defined in the **PCC** and it is the last date when the Contractor shall commence execution of the Works under the Contract. (jj) **Subcontractor** means a person or corporate body, who has a contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site. (kk) **Temporary Works** means all temporary works of every kind other than Contractor's Equipment required on the Site for the execution and completion of the Works and remedying of any defects. (ll) A **Variation** is an instruction given by the Project Manager that varies the Works. (mm) **Works** means all works associated with the construction, reconstruction, site preparation, demolition, repair, maintenance or renovation of railways, roads, highways, or a building, an infrastructure or structure or an installation or any construction work relating to excavation, installation of equipment and materials, decoration, as well as physical services ancillary to works as detailed in the **PCC**, if the value of those services does not exceed that of the Works

	themselves. (nn) **Writing** means communication written by hand or machine duly signed and includes properly authenticated messages by facsimile or electronic mail.
2. Interpretation	2.1 In interpreting the GCC, singular also means plural, male also means female or neuter, and the other way around. Headings in the GCC shall not be deemed part thereof or be taken into consideration in the interpretation or construance of the Contract. Words have their normal meaning under the language of the Contract unless specifically defined.
	2.2 Entire Agreement The Contract constitutes the entire agreement between the Procuring Entity and the Contractor and supersedes all communications, negotiations and agreements (whether written or verbal) of parties with respect thereto made prior to the date of Contract Agreement; except those stated under GCC Sub Clause 6.1(j).
	2.3 Non waiver (a) Subject to GCC Sub Clause 2.3(b), no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.
	(b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.
	2.4 Severability If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.
	2.5 Sectional completion If sectional completion is specified in the **PCC**, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).
3. Communications and Notices	3.1 Communications between Parties such as notice, request or consent required or permitted to be given or made by one party to the other pursuant to the Contract shall be in writing to the

	addresses specified in the **PCC**.
	3.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.
	3.3 A Party may change its address for notice hereunder by giving the other Party notice of such change to the address.
4. Governing Law	4.1 The Contract shall be governed by and interpreted in accordance with the laws of the People's Republic of Bangladesh.
5. Governing Language	5.1 The Contract shall be written in English. All correspondences and documents relating to the Contract may be written in English or *Bangla*. Supporting documents and printed literature that are part of the Contract may be in another language, provided they are accompanied by an accurate translation of the relevant passages in English, in which case, for purposes of interpretation of the Contract, such translation shall govern.
	5.2 The Contractor shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.
6. Documents Forming the Contract and Priority of Documents	6.1 The following documents forming the Contract shall be interpreted in the following order of priority: (a) the signed Contract Agreement (**Form PW3-8**); (b) the Notification of Award (**PW3-7**); (c) the completed Tender and the appendix to the Tender; (d) the Particular Conditions of Contract; (e) the General Conditions of Contract; (f) the Technical Specifications; (g) the General Specifications; (h) the Drawings; (i) the priced Bill of Quantities and the Schedules; and (j) any other document listed in the **PCC** forming part of the Contract.
7. Scope of Works	7.1 The Works to be executed, completed and maintained shall be as specified in the Bill of Quantities, the General and Particular Specifications and Drawings. 7.2 Unless otherwise stipulated in the Contract, the Works shall include all such items not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for completion of the Works as if such items were expressly mentioned in the Contract.
8. Assignment	8.1 Neither the Contractor nor the Procuring Entity shall assign, in whole or in part, its obligations under the Contract

9. Eligibility	9.1 The Contractor and its Subcontractor(s) shall have the nationality of a country other than that specified in the **PCC**.
	9.2 All materials, equipment, plant, and supplies used by the Contractor in both works and services supplied under the Contract shall have their origin in the countries except any specified in the **PCC**.
10. Gratuities / Agency fees	10.1 No fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the tender or in the Contract, have been given or received in connection with the procurement process or in the Contract execution.
11. Confidential Details	11.1 The Contractor's and the Procuring Entity's personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Contractor's compliance with the Contract and allow its proper implementation. 11.2 Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.
12. JVCA	12.1 If the Contractor is a Joint Venture, Consortium, or Association (JVCA), (a) each partner of the JVCA shall be jointly and severally liable for all liabilities and ethical or legal obligations to the Procuring Entity for the fulfilment of the promises of the Contract; (b) the JVCA partners shall nominate a representative who shall have the authority to conduct all business including the receipt of payments for and on behalf of all partners of the JVCA; (c) the JVCA shall notify the Procuring Entity of its composition and legal status which shall not be altered without the prior approval of the Procuring Entity. (d) alteration of partners shall only be allowed if any of the partners is found to be incompetent or has any serious difficulties which may impact the overall implementation of the works.
13. Possession of the Site	13.1 The Procuring Entity shall give possession of the Site or part(s) of the Site, to the Contractor on the date(s) stated in the **PCC**. If possession of a part of the Site is not given by the date stated in the **PCC**, the Procuring Entity will be deemed to have delayed the start of the relevant activities, and this will be a Compensation Event as

		stated under GCC Sub Clause 69.1(a).
14. Access to the Site	14.1	The Contractor shall allow the Project Manager and any person authorised by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.
15. Procuring Entity's Responsibilities	15.1	The Procuring Entity shall pay the Contractor, in consideration of the satisfactory progress of execution and completion of the Works and Physical 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 Agreement.
	15.2	The Procuring Entity shall make its best effort to guide and assist the Contractor in obtaining, if required, any permit, licence, and approvals from local public authorities for the purpose of execution of the Works and Physical services under the Contract.
16. Approval of the Contractor's Temporary Works	16.1	The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, who is to approve them, if they comply with the Specifications and Drawings.
	16.2	The Contractor shall be responsible for design of Temporary Works.
	16.3	The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.
	16.4	The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.
17. Contractor's Responsibilities	17.1	The Contractor shall execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract Agreement.
18. Taxes and Duties	18.1	The Contractor shall be entirely responsible for all taxes, duties, fees, and other such levies imposed inside and outside Bangladesh.
19. Contractor's Personnel	19.1	The Contractor shall employ the key personnel named in the Schedule of Key Personnel, as referred to in the **PCC**, to carry out the functions stated in the Schedule or other personnel approved by the Project Manager.
	19.2	The Project Manager will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are equal to or higher than those of the personnel named in the Schedule.
	19.3	If the Project Manager asks the Contractor to remove a particular person who is a member of the Contractor's staff or work force from the Site, he or she shall state the reasons, and the Contractor

		shall ensure that the person leaves the Site within three (3) days and has no further connection with the work in the Contract.
20. Subcontracting	20.1	Subcontracting the whole of the Works by the Contractor shall not be permissible. The Contractor shall be responsible for the acts or defaults of any Subcontractor, his or her agents or employees, as if they were the acts or defaults of the Contractor.
	20.2	The prior consent, in writing, of the Project Manager shall however be obtained for other proposed Subcontractor(s).
	20.3	Subcontractors shall comply with the provisions of GCC Clause 39.
21. Nominated Subcontractor	21.1	Nominated Subcontractor named in the Contract shall be entitled to execute the specific components of the Works stated in the **PCC**.
	21.2	The Contractor shall not be under obligations to employ a Nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Project manager as soon as practicable, with supporting particulars while there are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength, or does not accept to indemnify the Contractor against and from any negligence or misuse of Goods by the nominated Subcontractor, or does not accept to enter into a subcontract which specifies that, for the subcontracted work including design, if any, the Nominated Subcontractor shall undertake to the Contractor such obligations and liabilities as will enable the contractor to discharge his or her liabilities under the Contract.
	21.3	Subcontracting shall in no event relieve the Contractor from any of its obligations, duties, responsibilities, or liability under the Contract and all Subcontractors shall comply with the provisions of GCC Clause 39.
22. Other Contractors	22.1	The Contractor shall cooperate and share the Site with other Contractors, public authorities, utilities, the Project Manager and the Procuring Entity between the dates given in the Schedule of other Contractors. The Contractor shall also provide facilities and services for them as described in the Schedule. The Procuring Entity may modify the Schedule of other Contractors, and shall notify the Contractor of any such modification.
23. Project Manager's Decisions	23.1	Except where otherwise specifically stated in the **PCC**, the Project Manager will decide Contractual matters between the Procuring Entity and the Contractor in its role as representative of the Procuring Entity.
24. Delegation	24.1	The Project Manager may delegate any of his duties and responsibilities to his representative except to the Adjudicator, after notifying the Contractor, and may cancel any delegation, without retroactivity, after notifying the Contractor.
	24.2	Any communications to the Contractor in accordance with such delegation shall have the same effect as if it was given by the

		Project Manager.
25. Instructions,	25.1	The Contractor shall carry out all instructions of the Project Manager that comply with the applicable law.
26. Queries about the Contract conditions	26.1	The Project Manager, on behalf of the Procuring Entity, will clarify queries on the Conditions of Contract.
27. Safety, Security and Protection of the Environment	27.1	The Contractor shall throughout the execution and completion of the Works and the remedying of any defects therein: (a) take all reasonable steps to safeguard the health and safety of all workers working on the Site and other persons entitled to be on it, and to keep the Site in an orderly state; (b) provide and maintain at the Contractor's own cost all lights, guards, fencing, warning signs and watching for the protection of the Works or for the safety on-site; and (c) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of the Contractors methods of operation.
28. Working Hours	28.1	The Contractor shall not perform any work on the Site on the weekly holidays, or during the night or outside the normal working hours, or on any religious or public holiday, without the prior written approval of the Project Manager.
29. Welfare of Labourers	29.1	The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's personnel relating to their employment, health, safety, welfare, immigration and shall allow them all their legal rights.
	29.2	The Contractor, in particular, shall provide proper accommodation to his or her labourers and arrange proper water supply, conservancy and sanitation arrangements at the site for all necessary hygienic requirements and for the prevention of epidemics in accordance with relevant regulations, rules and orders of the government.
	29.3	The Contractor, further in particular, shall pay reasonable wages to his or her labourers, and pay them in time. In the event of delay in payment the Procuring Entity may effect payments to the labourers and recover the cost from the Contractor.
30. Child Labour	30.1	The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development in compliance with the applicable labor laws and other relevant treaties ratified by the government.
31. Discoveries	31.1	Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the

		Procuring Entity. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.
32. Procuring Entity's and Contractor's Risks	32.1	The Procuring Entity carries the risks that the Contract states are Procuring Entity's risks and the Contractor carries the risks that the Contract states are Contractor's risks.
33. Procuring Entity's Risks	33.1	From the Start Date until the Defects Correction Certificate has been issued, the following are Procuring Entity's risks: (a) the risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to i. use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or ii. negligence, breach of statutory duty, or interference with any legal right by the Procuring Entity or by any person employed by or Contracted to him except the Contractor. (b) the risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Procuring Entity or in the Procuring Entity's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.
	33.2	From the Completion Date until the Defects Correction Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is Procuring Entity's risk, except loss or damage due to: (a) a Defect which existed on the Completion Date; (b) an event occurring before the Completion Date, which was not itself Procuring Entity's risk; or (c) the activities of the Contractor on the Site after the Completion Date.
34. Contractor's Risks	34.1	From the Start Date until the Defects Correction Certificate has been issued the risks of personal injury, death, and loss of or damage to property including without limitation, the Works, Plant, Materials, and Equipment, which are not Procuring Entity's risks are Contractor's risks.
35. Copyright	35.1	The copyright in all drawings, documents, and other materials containing data and information furnished to the Procuring Entity by the Contractor herein shall remain vested in the Contractor, or, if they are furnished to the Procuring Entity directly or through the Contractor by any third party, including Suppliers of materials, the copyright in such materials shall

	remain vested in such third party.
	35.2 The Contractor shall not, except for the purposes of performing the obligations under the Contract, without the written permission of the Procuring Entity disclose or make use of any specification, plan, design and drawing, pattern, sample or information furnished by or on behalf of the Procuring Entity.
36. Limitation of Liability	36.1 Except in cases of criminal negligence or wilful misconduct: (a) the Contractor shall not be liable to the Procuring Entity, whether in Contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Procuring Entity; and (b) the aggregate liability of the Contractor to the Procuring Entity, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective Works, or to any obligation of the Contractor to indemnify the Procuring Entity with respect to patent infringement.
37. Insurance	37.1 The Contractor shall provide, in the joint names of the Procuring Entity and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles specified in the **PCC** for the following events which are due to the Contractor's risks: (a) loss of or damage to the Works, Plant, and Materials; (b) loss of or damage to Equipment; (c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and (d) personal injury or death.
	37.2 The Contractor shall deliver policies and certificates of insurance to the Project Manager, for the Project Manager's approval, before the Start Date. All such insurances shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.
	37.3 If the Contractor does not provide any of the policies and certificates required, the Procuring Entity may effect the insurance which the Contractor should have provided and recover the premiums the Procuring Entity has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.
	37.4 Alterations to the terms of insurance shall not be made without the approval of the Project Manager.

	37.5 Both parties shall comply with conditions of the insurance policies.
38. Management and Progress Meetings	38.1 Either the Project Manager or the Contractor may require the other to attend a management and progress meeting. The business of such meeting shall be to review the progress and plans for remaining work and to deal with matters raised in accordance with the early warning procedure.
	38.2 The Project Manager shall record the business of the meetings and provide copies of the record to those attending the meeting and to the Procuring Entity. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management and progress meeting or after the meeting, and stated in writing to all concerned.
39. Corrupt, Fraudulent, Collusive, Coercive, or Obstructive Practices	39.1 The Government and the Bank requires that Procuring Entity, as well as the Contractor shall observe the highest standard of ethics during the implementation of procurement proceedings and the execution of the Contract under public fund.
	39.2 For the purposes of GCC Sub Clause 39.3, the terms set forth below as follows: (a) "corrupt practice" means offering, giving or promising to give, receiving, or soliciting either directly or indirectly, to any officer or employee of a Procuring Entity or other public or private authority or individual, a gratuity in any form; employment or any other thing or service of value as an inducement with respect to an act or decision or method followed by a Procuring Entity in connection with a Procurement proceeding or Contract execution; (b) "fraudulent practice" means the misrepresentation or omission of facts in order to influence a decision to be taken in a Procurement proceeding or Contract execution;

	(c) "collusive practice" means a scheme or arrangement between two (2) or more Persons, with or without the knowledge of the Procuring Entity, that is designed to arbitrarily reduce the number of Tenders submitted or fix Tender prices at artificial, non-competitive levels, thereby denying a Procuring Entity the benefits of competitive price arising from genuine and open competition; or (d) "coercive practice" means harming or threatening to harm, directly or indirectly, Persons or their property to influence a decision to be taken in the Procurement proceeding or the execution of the Contract, and this will include creating obstructions in the normal submission process used for Tenders. (e) "obstructive practice" means deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; and also means acts intended to materially impede the exercise of the inspection and audit rights provided for under GCC Sub-Clause 39.6.
	39.3 Should any corrupt, fraudulent, collusive, coercive or obstructive practice of any kind, in competing for or in executing the Contract, is determined by the Procuring Entity, then the Procuring Entity may, upon giving 28 days' notice to the Contractor, terminate the Contractor's employment under the Contract and expel the contractor from the site, and the provisions of Clause 89 shall apply as if such expulsion had been made under sub-clause 89.1 (Termination for Default).
	39.4 Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the Works, then that employee shall be removed in accordance with Clause 19.3.

	39.5 The Contractor shall be aware of the provisions on corruption, fraudulence, collusion, coercion and obstruction of the Procurement Guidelines of The Bank, Public Procurement Act 2006 and Public Procurement Rules 2008. 39.6 The Contractor (including its suppliers, sub-contractors, agents, personnel, consultants, and service providers) shall permit the Government and/or the Bank to inspect the Contractor's accounts and records and other documents relating to the submission of tender and contract performance, and to have them audited by auditors appointed by the Government and/or the Bank, if so required. The Contractor's attention is drawn to GCC Sub-Clause 39.3 which provides, inter alia, that acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under this sub-clause constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility under the Procurement Guidelines of the Bank).
B. Time Control	
40. Commencement of Works	40.1 Except otherwise specified in the **PCC** , the Commencement Date shall be the date at which the following precedent conditions have all been fulfilled and the Project Manager's instruction recording the agreement of both Parties on such fulfilment and instructing to commence the Works is received by the Contractor: (a) signing of the Contract Agreement by both parties upon approval of the by relevant authorities; (b) possession of the Site given to the Contractor as required for the commencement of the Works; and (c) receipt by the Contractor of the Advance Payment under GCC Clause 75 provided that the corresponding Bank Guarantee has been delivered by the Contractor, if any.
	If the Project Manager's instruction is not received by the Contractor within one hundred eighty (180) days from the date of signing of the Contract Agreement, the Contractor shall be entitled to terminate the Contract under GCC Sub Clause 90.1.
	40.2 The Contractor shall commence the execution of the Works as soon as is reasonably practicable by the **Start Date** as specified in the GCC Sub Clause **1.1(nn)** after the Commencement Date, and shall then proceed with the Works with due expedition and without delay.
41. Completion of Works	41.1 The Contractor shall carry out the Works in accordance with the Programme of Works submitted by the Contractor and as updated with the approval of the Project Manager as stated under GCC Clause 42 to complete them in all respects by the Intended Completion Date.
42. Programme of Works	42.1 Within the time stated in the **PCC**, the Contractor shall submit to the Project Manager for approval a Programme of Works

	showing the general methods, arrangements, order, and timing for all the activities in the Works. The programme may be in the form of an Implementation Schedule prepared in any software or other form acceptable to the Project Manager.
	42.2 The Contractor shall submit to the Project Manager for approval of an updated Programme at intervals no longer than the period stated in the **PCC**. An update of the Programme shall be a Programme showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.
	42.3 If the Contractor does not submit an updated Programme of Works at the intervals as stated under GCC Sub Clause 42.2 , the Project Manager may withhold an amount as stated in the **PCC** from the next payment certificate and continue to withhold this amount until the next due payment after the date on which the overdue Programme of Works has been submitted.
	42.4 The Project Manager's approval of the Programme of Works shall not alter the Contractor's obligations. The Contractor may revise the Programme and submit it to the Project Manager again at any time for approval. A revised Programme shall show the effect of Variations and Compensation Events.
43. Pro Rata Progress	43.1 The Contractor shall maintain Pro Rata progress of the Works. Progress to be achieved shall be pursuant to GCC Clause 42 and shall be determined in terms of the value of the works done.
44. Early Warning	44.1 If at any time during performance of the Contract, the Contractor or its Subcontractors should encounter events, circumstances, conditions that may adversely affect the quality of the work, increase the Initial Contract Price or delay the execution of the Works, the Contractor shall promptly notify the Project Manager in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Contractor's notice, the Project Manager shall evaluate the situation, and the Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced.
	44.2 The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Initial Contract price and Completion Date. The Contractor shall provide the estimate and the Project Manager shall further proceed as soon as reasonably possible.
45. Extension of Intended Completion Date	45.1 The Contractor shall be entitled to an extension of the Intended Completion Date, if and to the extent that completion of the Works or any part thereof is or will be delayed by Compensation Events or a Variation or Extra Work Order.

	45.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within twenty-one (21) days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the extension of Intended Completion Date.
	45.3 Except in case of Force Majeure, as provided under GCC Clause 85, a delay by the Contractor in the performance of its Completion obligations shall render the Contractor liable to the imposition of Liquidated Damages pursuant to GCC Clause 73, unless an extension of Intended Completion Date is agreed upon, pursuant to GCC Clause 45. 45.4 If the Contractor fails to complete the Works by the Intended Completion Date, as extended by the Project Manager as the case may be, the Contractor shall be liable to pay liquidated damages to the Employer.
46. Delays Caused by Authorities	46.1 If the following conditions apply, namely: (a) the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities, (b) these public authorities delay or disrupt the Contractor's work, and (c) the delay or disruption was unforeseeable; then this delay or disruption will be considered as a cause of delay under GCC Sub Clause 45.1.
	46.2 The Project Manager shall notify the Contractor accordingly keeping the Procuring Entity posted.
47. Acceleration	47.1 When the Procuring Entity wants the Contractor to finish the Works before the Intended Completion Date, the Project Manager will obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Procuring Entity accepts these proposals, the Intended Completion Date will be advanced accordingly and confirmed by both the Procuring Entity and the Contractor.
	47.2 If the Procuring Entity accepts the Contractor's priced proposals for acceleration, they will be incorporated in the Contract Price and treated as a **Variation** under GCC Clause 62.
48. Delays Ordered by the Project Manager	48.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

49. Suspension of Work	49.1	The Project Manager may at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.
50. Consequences of Suspension	50.1	If the Contractor suffers delay and/or incurs Cost from complying with the Project Manager's instructions under GCC Clause 49 and/or from resuming the work, the Contractor shall give notice to the Project Manager and shall be entitled subject to GCC Clause 93 to: (a) an extension of time for any such delay, if Completion is or will be delayed and (b) payment of any such cost, which shall be included in the Contract Price.
	50.2	After receiving this notice, the Project Manager shall proceed to agree or determine these matters.
	50.3	The Contractor shall not be entitled to any extension of time for, or to any payment of the cost incurred in, making good the consequences of the Contractor's faulty design, workmanship or materials, or of the Contractor's failure to protect, store or secure in accordance with GCC Clause 49.
C. Quality Control		
51. Execution of Works	51.1	The Contractor shall construct, install and carry out the Works and Physical services in accordance with the Specifications and Drawings as scheduled in GCC Clause 6.
52. Examination of Works before covering up	52.1	All works under the Contract shall at all times be open to examination, inspection, measurements, testing and supervision of the Project Manager, and the Contractor shall ensure presence of its representatives at such actions provided proper advance notice is given by the Project Manager.
	52.2	No part of the Works shall be covered up or put out of sight without the approval of the Project Manager. The Contractor shall give notice in writing to the Project Manager whenever any such part of the Works is ready for examination and the Project Manager shall attend to such examination without unreasonable delay.
53. Identifying Defects	53.1	The Project Manager shall check the works executed by the Contractor and notify the Contractor of any Defects found. Such checking shall not relieve the Contractor from his or her obligations. The Project Manager may also instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.
54. Testing	54.1	If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has

		a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.
55. Rejection of Works	55.1	If, as a result of an examination, inspection, measurement or testing, of Works it is found to be defective or otherwise not in accordance with the Contract, the Project Manager may reject the Works by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected Works subsequently complies with the Contract.
56. Remedial Work	56.1	Notwithstanding any test or certification, the Project Manager may instruct the Contractor to: (a) remove from the Site and replace any Plant or Materials which is not in accordance with the Contract, (b) remove and re-execute any other work which is not in accordance with the Contract, and (c) execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.
	56.2	The Contractor shall comply with the instruction issued under GCC Sub Clause 56.1 within a reasonable time, which shall be specified in the instruction, or immediately if urgency is specified under GCC Sub Clause 56.1(c).
	56.3	If the Contractor fails to comply with the instruction issued under GCC Sub Clause 56.2, the Procuring Entity shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall be liable to pay all such costs arising from this failure.
57. Correction of Defects	57.1	The Project Manager shall give notice to the Contractor, with a copy to the Procuring Entity and others concerned, of any Defects before the end of the Defects Liability Period, which begins at Completion Date, and is defined in the **PCC**. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.
	57.2	Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.
58. Uncorrected Defects	58.1	If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected by it, and the Contractor shall remain liable to pay the expenditures incurred on account of correction of such Defect.
D. Cost Control		

59. Contract Price	59.1 The Contract Price shall be as specified in the Contract Agreement subject to any additions and adjustments thereto, or deductions therefrom, as may be made pursuant to Contract
60. Bill of Quantities	60.1 The Bill of Quantities shall contain priced items for the construction, installation, testing, and commissioning work to be done by the Contractor.
	60.2 The Bill of Quantities is used to calculate the Contract Price. The Contractor is paid for the quantity of the work done at the rate in the Bill of Quantities for each item.
61. Changes in the Quantities and Unit Rate or Price	61.1 If the final quantity of the work done for any particular item differs from the quantity in the Bill of Quantities by more than twenty-five percent (25%), provided the change in case exceeds one percent (1%) of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change.
	61.2 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.
62. Variations	62.1 All Variations and Extra Work Orders under the Contract shall be included in the updated Programme of Works produced by the Contractor.
63. Costing of Variations or Extra Orders	63.1 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.
	63.2 If the work in the Variation corresponds with an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work not above the limit stated in GCC Sub-Clause 61.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.
	63.3 If the Contractor's quotation is found to be unreasonable, the Project Manager may order the Variation and make a change to the Contract price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.
	63.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the

		Variation shall be treated as a Compensation Event under GCC Sub Clause 69.
	63.5	The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning under GCC Sub Clause 44.1.
64. Cash Flow Forecasts	64.1	When the Programme of Works is updated under GCC Sub Clause 42.2, the Contractor shall provide the Project Manager with an updated cash flow forecast.
65. Payment Certificates	65.1	The basis for payment certificates shall be Bill of Quantities used to determine the Contract price.
	65.2	The Contractor shall submit to the Project Manager monthly statements of the estimated value of the works executed less the cumulative amount certified previously.
	65.3	The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.
	65.4	The value of work executed shall be determined by the Project Manager.
	65.5	The value of work executed shall include the valuation of Variations or Extra Work Orders, Certified Dayworks and Compensation Events.
	65.6	The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.
66. Payments to the Contractor	66.1	Payments shall be adjusted for deductions for advance payments and retention. The Procuring Entity shall pay the Contractor the amounts certified by the Project Manager within twenty eight (28) days of the date of each certificate after due adjustments for deductions for advance payments, retention and any other additions or deductions which may have become due under the Contract or otherwise, including those under GCC Clause 93.
	66.2	Items of works quantified in the Bill of Quantities for which no rates or prices have been quoted shall be deemed covered by the amounts at rates and prices of other items in the Contract.
	66.3	Payments due to the Contractor in each certificate shall be made into the Bank Account in any scheduled Bank of Bangladesh of the title of the Contract specified in the **PCC**, nominated by the Contractor in the currency specified in the Contract.
67. Delayed Payment	67.1	If the Procuring Entity makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.

	67.2 If an amount certified is increased in a subsequent certificate as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
68. Payments to Nominated Subcontractor(s)	68.1 The Contractor shall pay to the Nominated Subcontractor(s) the amounts shown on the Nominated Subcontractor's invoices approved by the Contractor which the Project Manager certifies to be due in accordance with the subcontract included under the Contract.
69. Compensation Events	69.1 The following shall be Compensation Events: (a) The Procuring Entity does not give access to or possession of the Site or part of the Site by the Site Possession Date stated in the GCC Sub Clause 13.1; (b) The Procuring Entity modifies the Schedule of other Contractors in a way that affects the works of the Contractor under the Contract; (c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time; (d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects; (e) The Project Manager unreasonably does not approve a subcontract to be let, if applicable; (f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Notification of Award from the information issued to Tenderers (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site; (g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Procuring Entity, or additional work required for safety or other reasons; (h) Other Contractors, public authorities, utilities, or the Procuring Entity do not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor; (i) The advance payment is delayed; (j) The effects on the Contractor of any of the Procuring Entity's Risks; (k) The Project Manager unreasonably delays issuing a Completion Certificate; (l) A situation of Force Majeure has occurred, as defined in GCC Clause 85; and (m) Other Compensation Events described in the Contract or

	determined by the Project Manager in the **PCC** shall apply.
	69.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract price shall be increased and whether and by how much the Intended Completion Date shall be extended, only on justifiably acceptable grounds duly recorded.
	69.3 As soon as the Contractor has provided information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost, the Project Manager shall assess it, and the Contract price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract price based on the Project Manager's own forecast. The Project Manager will assume that the Contractor will react competently and promptly to the event.
	69.4 The Contractor shall not be entitled to compensation to the extent that the Procuring Entity's interests are adversely affected by the Contractor not having given early warning or not having cooperated with the Project Manager.
70. Adjustments for Changes in Legislation	70.1 Unless otherwise specified in the Contract, if between the date twenty-eight (28) days before the submission of Tenders for the Contract and the date of the last Completion Certificate, any law, regulation, ordinance, order or bylaw having the force of law is enacted, promulgated, abrogated, or changed in Bangladesh (which shall be deemed to include any change in interpretation or application by the approving authorities) that subsequently affects the Completion Date and/or the Contract price, then such Completion Date and/or Contract price shall be correspondingly increased or decreased, to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract.
	70.2 The Project Manager shall adjust the Contract Price on the basis of the change in the amount of taxes, duties, and other levies payable by the Contractor, provided such changes have not already been accounted for in the price adjustment as defined in GCC Clause 69 and/or reflected in the Contract price.
71. Price Adjustment	71.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the **PCC**. If so provided, the amounts as certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amount. The formula indicated below applies: **P= A + B (Im/Io)** where: **P** is the adjustment factor

		A and **B** are Coefficients specified in the **PCC**, representing the nonadjustable and adjustable portions, respectively, of the Contract; and **Im** is the Index during the month the work has been executed and **Io** is the Index prevailing twenty eight (28) days prior to the deadline for submission of Tender. The Indexes to be used is as published by the Bangladesh Bureau of Statistics (BBS) on a monthly basis. In case not available, then other countries or authorities of the sources mentioned in **Appendix to the Tender** may be used.
		If the value of the Index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The Index value shall be deemed to take account of all changes in price due to fluctuations.
72. Retention Money	72.1	The Procuring Entity may retain from each progressive payment due to the Contractor at the percentage specified in the **PCC** until completion of the whole of the Works under the Contract.
	72.2	On completion of the whole of the Works, the first half the total amount retained under GCC Sub Clause 72.1 shall be repaid to the Contractor and the remaining second half after the Defects Liability Period has passed and the Project Manager has certified in the form of **Defects Corrections Certificate.**.
	72.3	On completion of the whole of the Works, the Contractor may substitute an unconditional Bank Guarantee in the format as specified (**Form PW3-11**) acceptable to the Procuring Entity for the second half of the retention money as stated under GCC Sub Clause 72.2.
73. Liquidated Damages	73.1	The Contractor shall pay liquidated damages[16] to the Procuring Entity at the rate per day stated in the **PCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the **PCC**. The Procuring Entity may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.
	73.2	If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in Sub-Clause 43.1.

[16] Usually liquidated damages are set between 0.05 percent and 0.10 percent per day, and the total amount is not to exceed between 5 percent and 10 percent of the Contract Price.

74. Bonus	74.1	The Contractor shall be paid a Bonus calculated at the rate per calendar day **if stated in the PCC** for each day (less any days for which the Contractor is paid for acceleration) that the Completion of the whole of the Works is earlier than the Intended Completion Date. The Project Manager shall require certifying that the Works are complete, although they may not have fallen due to being complete as per approved updated Programme of Works.
75. Advance Payment	75.1	If so specified in the **PCC,** the Procuring Entity shall make advance payment to the Contractor of the amounts and by the dates stated in the **PCC** against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Procuring Entity in an amount equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest will not be charged on the advance payment.
	75.2	The Contractor shall use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used for such specific purposes by supplying copies of invoices or other documents to the Project Manager.
	75.3	The advance payment shall be repaid by deducting at proportionate rate from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.
76. Performance Security	76.1	The Procuring Entity shall notify the Contractor of any claim made against the Bank issuing the Performance Security.
	76.2	The Procuring Entity may claim against the security if any of the following events occurs for fourteen (14) days or more. (a) The Contractor is in breach of the Contract and the Procuring Entity has duly notified him or her ; and (b) The Contractor has not paid an amount due to the Procuring Entity and the Procuring Entity has duly notified him or her.
	76.3	In the event the Contractor is liable to pay compensation under the Contract amounting to the full value of the Performance Security or more, the Procuring Entity may call the full amount of the Performance Security.
	76.4	The Performance Security furnished at the time of signing of the Contract Agreement shall be substituted, after the issuance of certificate of Completion of works by the Project Manager, by

	a new Security covering fifty (50) percent amount of the Performance Security to cover the Defects Liability Period.
	76.5 If there is no reason to call the Performance Security, the Performance Security shall be discharged by the Employer and returned to the Contractor not later than twenty-eight (28) days after the Defects Liability Period has passed and the Project Manager has certified in the form of **Defects Corrections Certificate**
77. Provisional Sums	77.1 Provisional Sums shall only be used, in whole or in part, in accordance with the Project Manager's instructions and the Contract price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the Project Manager shall have instructed.
	77.2 Plants, Materials or Services to be purchased by the Contractor under the provisions of GCC Sub Clause 77.1 from Nominated Subcontractor(s) or for meeting the other expenditures under the Contract, and for which there shall be included in the Contract price, the actual amounts paid or due to be paid by the Contractor, and a sum for VAT, profit and overhead charges, as applicable, calculated as a percentage of these actual amounts by applying the relevant percentage rate stated in the **PCC**.
	77.3 The Contractor shall, when required by the Project Manager, produce quotations, invoices, vouchers and accounts or receipts in substantiation of purchases under GCC Sub Clause 77.2.
78. Dayworks	78.1 If applicable, the Dayworks rates in the Contractor's Tender shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.
	78.2 All works to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be certified and signed by the Project Manager within seven (7) days of the works being done.
	78.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.
79. Cost of Repairs to Loss or Damages	79.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Liability Period shall be remedied by the Contractor at the Contractor's own cost, if the loss or damage arises from the Contractor's acts or omissions.
E. Completion of the Contract	
80. Completion	80.1 The Contractor shall apply by notice to the Project Manager for issuing a Completion Certificate of the Works, and the Project

	Manager shall do so upon deciding that the work is completed.
81. Taking Over	81.1 The Procuring Entity shall take over the Site and the Works within seven (7) days of the Project Manager's issuing a certificate of Completion.
82. Amendment to Contract	82.1 The amendment to Contract shall generally include extension of time to the Intended Completion Date, increase or decrease in initial Contract price and any other changes acceptable under the conditions of the Contract.
	82.2 The Procuring Entity, in accordance with the Delegation of Financial Power or sub-delegation thereof, shall amend the Contract incorporating the changes introduced to the original terms and conditions of the Contract in line with the Rules.
83. Final Account	83.1 The Contractor shall submit with a detailed account of the total amount that the Contractor considers payable under the Contract to the Project Manager before the end of the **Defects Liability Period**.
	83.2 The Project Manager shall certify the **Final Payment** within fifty six (56) days of receiving the Contractor's account if the payable amount claimed by the Contractor is correct and the corresponding works are completed.
	83.3 If it is not, the Project Manager shall issue within fifty six (56) days a **Defects Liability Schedule** that states the scope of the corrections or additions that are necessary.
	83.4 If the **Final Account of Works** submitted under GCC Sub Clause 83.1 is unsatisfactory even after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.
84. As-built Drawings and Manuals	84.1 If "As Built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the **PCC**.
	84.2 If the Contractor does not supply the Drawings and/or Manuals by the dates specified in GCC Sub Clause 84.1, or they do not receive the Project Manager's approval, the Project Manager shall withhold a nominal amount specified in the **PCC** from payments due to the Contractor.
85. Force Majeure	85.1 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind stated below; (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies ; (b) rebellion, terrorism, sabotage by persons other than the Contractor's personnel, revolution, insurrection, military or usurped power, or civil war ; (c) riot, commotion, disorder, strike or lockout by persons

	other than the Contractor's personnel ; (d) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity ; and (e) natural catastrophes such as fires, floods, epidemics, quarantine restrictions, freight embargoes, cyclone, hurricane, typhoon, tsunami, storm surge, earthquake, hill slides, landslides, and volcanic activities.
86. Notice of Force Majeure	86.1 If a party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice, within fourteen (14) days after the party became aware, to the other party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented.
	86.2 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either party to make payments to the other party under the Contract.
87. Consequences of Force Majeure	87.1 If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under GCC Sub Clause 86, and suffers delay and/or incurs cost by reason of such Force Majeure, the Contractor shall be entitled subject to GCC Sub Clause 93 to: (a) an extension of time for any such delay, if completion is or will be delayed, under GCC Clause 45, and (b) if the event or circumstance is of the kind described sub-paragraphs (a) to (e) of GCC Sub Clause 85.1 occurs in the Country, payment of any such cost, including the costs of rectifying or replacing the Works and Physical services damaged or destructed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in GCC Clause 37.
	87.2 After receiving notice under GCC Sub Clause 86.1, the Project Manager shall proceed to determine these matters under the provisions of the Contract.
88. Release from Performance	88.1 Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both parties to fulfil its or their contractual obligations or which, under the law governing the Contract, entitles the parties to be released from further performance of the Contract, then upon notice by either party to the other party of such event or circumstance: (a) the parties shall be discharged from further

	performance, without prejudice to the rights of either party in respect of any previous breach of the Contract, and (b) the sum payable by the Procuring Entity to the Contractor shall be the same as would have been payable under GCC Sub Clause 90.3 if the Contract had been terminated under GCC Sub Clause 89.3.
F. Termination and Settlement of Disputes	
89. Termination	89.1 **<u>Termination for Default</u>** (a) The Procuring Entity or the Contractor, without prejudice to any other remedy for breach of Contract, by giving twenty eight (28) days written notice of default to the other party, may terminate the Contract in whole or in part if the other party causes a fundamental breach of Contract. (b) Fundamental breaches of the Contract shall include, but shall not be limited to, the following: (i) the Contractor stops work for twenty-eight (28) days when no stoppage of work is shown on the current Programme and the stoppage has not been authorized by the Project Manager; (ii) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within eighty four (84) days; (iii) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager; (iv) the Contractor does not maintain a Security, which is required; (v) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of Liquidated Damages can be paid, as specified in GCC Sub Clause 73; (vi) the Contractor has subcontracted the whole of the Works or has assigned the Contract without the required agreement and without the approval of the Project Manager; (vii) the Contractor, in the judgment of the Procuring Entity has engaged in corrupt or fraudulent practices, as defined in GCC Sub Clause 39, in competing for or in executing the Contract. (viii) A payment certified by the Project Manager is not paid by the Procuring Entity to the Contractor within eighty-four (84) days of the date of the Project Manager's certificate.

	89.2 **Termination for Insolvency** The Procuring Entity and the Contractor may at any time terminate the Contract by giving twenty eight (28) days written notice to the other party if either of the party becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to any party, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the other party.
	89.3 **Termination for Convenience** (a) The Procuring Entity, by giving twenty eight (28) days written notice sent to the Contractor, 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 Entity's convenience, the extent to which performance of the Contractor under the Contract is terminated, and the date upon which such termination becomes effective. (b) The Procuring Entity shall not terminate the contract under GCC Sub Clause 89.3 (a) in order to execute the Works itself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor as stated under GCC Sub Clause 89.1(a).
	89.4 In the event the Procuring Entity terminates the Contract in whole or in part, the Procuring Entity shall accept the portion of the Works that are complete and ready for handing over after the Contractor's receipt of notice of termination of the Contract. For the remaining portion of the Works, the Procuring Entity may elect: (a) to have any portion completed by the Contractor at the Contract terms and prices; and /or (b) to cancel the remainder and pay to the Contractor an agreed amount for partially completed Works and for materials and parts previously procured by the Contractor, or (c) except in the case of termination for convenience as stated under GCC Sub Clause 89.3., engage another Contractor to complete the Works, and in that case the Contractor shall be liable to the Procuring Entity for any cost that may be incurred in excess of the sum that would have been paid to the Contractor, if the work would have been executed and completed by him or her.
	89.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as is reasonably possible

90. Payment upon Termination	90.1 If the Contract is terminated because of a fundamental breach of Contract under GCC Sub Clause 89.1 by the Contractor, the Project Manager shall issue a certificate for the value of the Works done and Plant and Materials ordered less advance payments received up to the date of the issue of the certificate and less the amount from percentage to apply to the contract value of the works not completed, as indicated in the **PCC**. If the total amount due to the Procuring Entity exceeds any payment due to the Contractor, the difference shall be a debt payable to the Procuring Entity.
	90.2 If the Contract is terminated for the Procuring Entity's convenience or because of a fundamental breach of Contract by the Procuring Entity, the Project Manager shall issue a payment certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's foreign personnel employed solely on the Works and recruited specifically for the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.
	90.3 If the Contract is terminated for reasons of Force Majeure, the Project Manager shall determine the value of the work done and issue a Payment Certificate which shall include: (a) the amounts payable for any work carried out for which unit rates or prices are stated in the Contract; (b) the cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Procuring Entity when paid for by the Procuring Entity, and the Contractor shall place the same at the Procuring Entity's disposal; (c) other costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works; (d) the cost of removal of Temporary Works and Contractor's Equipment from the Site; and (e) the cost of repatriation of the Contractor's staff and labour employed wholly in connection with the Works at the date of termination.
91. Property	91.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Procuring Entity if the Contract is terminated because of the Contractor's default stated under GCC Sub Clause 89.1.
92. Frustration	92.1 If the Contract is frustrated by the occurrence of a situation of Force Majeure as defined in GCC Sub Clause 85, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as

	possible after receiving this certificate and shall be paid for all works carried out before receiving it and for any work carried out afterwards to which a commitment was made.
G. Claims, Disputes and Arbitration	
93. Contractor's Claims	93.1 If the Contractor considers himself to be entitled to any extension of the Completion Time and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Procuring Entity, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than twenty eight (28) days after the Contractor became aware, or should have become aware, of the event or circumstance.
	93.2 If the Contractor fails to give notice of a claim within such period of twenty eight (28) days, the Intended Completion Date shall not be extended, the Contractor shall not be entitled to additional payment, and the Procuring Entity shall be discharged from all liability in connection with the claim.
	93.3 Within forty two (42) days after the Contractor became aware or should have become aware of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Project Manager, the Contractor shall send to the Project Manager a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed, for settlement.
94. Settlement of Disputes	**Amicable settlement** 94.1 The procuring Entity and the Contractor shall use their best efforts to settle amicably all possible disputes arising out of or in connection with this Contract or its interpretation.
	94.2 **Adjudication** (a) If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within fourteen (14) days of notification of the Project Manager's decision in writing. (b) The Adjudicator named in the **PCC** is jointly appointed by the parties. In case of disagreement between the parties, the Appointing Authority designated in the **PCC** shall appoint the Adjudicator within fourteen (14) days of receipt of a request from either party. (c) The Adjudicator shall give its decision in writing to both parties within twenty-eight (28) days of a

	dispute being referred to it. (d) The Contractor shall make all payments (fees and reimbursable expenses) to the Adjudicator, and the Procuring Entity shall reimburse half of these fees through the regular progress payments. (e) Should the Adjudicator resign or die, or should the Procuring Entity and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract; a new Adjudicator will be jointly appointed by the Procuring Entity and the Contractor. In case of disagreement between the Procuring Entity and the Contractor the Adjudicator shall be designated by the Appointing Authority within fourteen (14) days of receipt of a request from either party as stated under GCC Sub Clause 94.2 (b)
	94.3 **Arbitration** (a) If the parties are unable to reach a settlement as per GCC Clauses 94.1 and 94.2 within twenty-eight (28) days of the first written correspondence on the matter of disagreement, then either party may give notice to the other party of its intention to commence arbitration in accordance with GCC Sub Clause 97.3(b). (b) The arbitration shall be conducted in accordance with the Arbitration Act (**Act No 1 of 2001**) of Bangladesh as at present in force and in the place shown in the **PCC**.

Section 4. Particular Conditions of Contract

Instructions for completing the Particular Conditions of Contract are provided in italics in parenthesis for the relevant GCC Clauses.	
GCC Clause	**Amendments of, and Supplements to, Clauses in the General Conditions of Contract**
GCC 1.1(k)	The Contractor is *[Name, address, and name of authorized representative]*
GCC 1.1(cc)	The Procuring Entity is Project Director, Bangladesh Economic Zones Development Project (Phase- 1) Address: Bangladesh Economic Zones Authority (BEZA), , Monem Business District (Level-12), 111, Bir Uttam C.R. Dutta Road, Dhaka-1205 Authorized Representative: Project Director, Bangladesh Economic Zones Development Project (Phase- 1)
GCC 1.1(dd)	The Project Manager is Executive Engineer, Bangladesh Economic Zones Development Project (Phase- I) Bangladesh Economic Zones Authority (BEZA), Address: Bangladesh Economic Zones Authority (BEZA), , Monem Business District (Level-12), 111, Bir Uttam C.R. Dutta Road, Dhaka-1205 Authorized Representative: Same as Project Manager
GCC 1.1 (z)	The initial Contract price is *[insert the amount in the NOA]*
GCC 1.1(w)	The Intended Completion Date for the whole of the Works shall be 6 (Six) months from the date of Commencement.
GCC 1.1(ff)	The Site is located at Bangabandhu Sheikh Mujib Shilpanagar, Upazila: Mirsarai, District: Chattogram .
GCC 1.1(ii)	The Start Date shall be 07 (Seven) days after the Commencement Date
GCC 1.1(mm)	The Works consist of Interior works, HVAC system installation and fire fighting system etc.
GCC 2.5	The Sectional Completion Dates are: None.
GCC 3.1	The Procuring Entity's address for the purpose of communications under this

<table>
<tr><td></td><td>contract is :
Contact person: Project Director, Bangladesh Economic Zones Development Project (Phase- I)
Bangladesh Economic Zones Authority (BEZA),
Address: Monem Business District (Level-12), 111, Bir Uttam C.R. Dutta Road, Dhaka-1205

Tel: +880 2 9632459
Fax:
e-mail address: bezaproject1@gmail.com</td></tr>
<tr><td></td><td>The Contractor's address for the purpose of communications under this contract is :
Contact person:
Address:
Tel:
Fax:
e-mail address:</td></tr>
<tr><td>GCC 6.1 (j)</td><td>Other documents forming part of the Contract are Environmental Management Plan, Work schedule, Schedule of key personnel, Schedule of equipment, Site inspection report, relevant correspondences prior to signing of the Contract agreement etc.</td></tr>
<tr><td>GCC 9.1</td><td>A Contractor or a Subcontractor that is a national of, or registered in, the following countries are not eligible: Israel.</td></tr>
<tr><td>GCC 9.2</td><td>Materials, Equipments, Plants and supplies shall not have their origin in the following countries: Israel.</td></tr>
<tr><td>GCC 13.1</td><td>Possession of the Site or part(s) of the Site, to the Contractor shall be given on the following date(s): 7 days from the date of commencement.</td></tr>
<tr><td>GCC 19.1</td><td>Following Key Personnel to carry out the functions stated in the Schedule shall be employed by the Contractor;
<table>
<tr><th>No</th><th>Position</th><th>Total Works Experience (years)</th><th>In Similar Works

Experience (years)</th></tr>
<tr><td>1</td><td>Project Manager- B.sc in Civil</td><td>Min. 10 years.</td><td>Min. 5 years.</td></tr>
</table></td></tr>
</table>

			Engg. -1 Person			
		2	Alternative Construction Project Manager- B.sc in Civil Engg. -1 Person	Min. 10 years.	Min. 5 years.	
		3	Field Engineer - B.sc in Civil Engg.- 1 Person	Min. 7 years.	Min. 3 years.	
		4	Field Engineer - B.sc in EEE - 1 Person	Min. 7 years.	Min. 3 years.	
		5	Field Engineer - B.sc in Architecture -1 Person	Min. 7 years.	Min. 3 years.	
		6	Quality Control Engineer - B.sc in Civil Engineer -1 Person	Min. 5 years.	Min. 3 years	
		7	Site Supervisor – (Diploma – in- Civil Engg. – 2 persons	Min. 10 years.	Min. 5 years.	
		8	Site Supervisor – Diploma –in- Electrical Engg – 1 persons	Min. 10 years.	Min. 5 years.	
		9	Site Supervisor – Diploma –in- Architecture – 1 persons	Min. 10 years.	Min. 5 years.	
		10	Surveyor (Certificated in	Min. 5 years.	Min. 3 years	

		Surveying) - 1 Person			
	11	Work Assistant-HSC- 2 Persons	Min. 5 years.	Min. 3 years	

[insert name(s)]

GCC 21.1	Nominated Subcontractor(s) named below: None.	
GCC 23.1	The Contractual matters between the Procuring Entity and the Contractor shall be decided by *the Project Manager.*	
GCC 37.1	The minimum insurance cover shall be:	
	(a)	The maximum deductible for insurance of the Works and of Plant and Materials is Tk 10% of contract value. The minimum cover for insurance of the Works and of Plant and Materials is Tk 110% of contract value *[state amount]*. *[the amount could be 110% of the value of the works, plant and materials that may be lost in a worst case scenario].*
	(b)	The minimum cover for loss or damage to Equipment is Tk 110% of contract value. The maximum deductible for insurance of Equipment is [*state amount].* *[the Contractor shall state this amount at the time of Contract signing. Amount could be 5 to 10 %t of the sum insured]*
	(c)	The maximum deductible for insurance of other property is Tk *[state amount]*. *[the Contractor shall state this amount at the time of Contract signing].* The minimum cover for insurance of other property is Tk 5% of contract value.
	(d)	The minimum cover for personal injury or death insurance: (i) for the Contractor's employees is Tk 2,00,000 (Two lacs taka only) for each death case And Tk 50,000 (Fifty thousand taka only) for each injury case. (ii) and for third parties is Tk 1,00,000 (One lac taka only) for each death case And Tk 30,000 (Thirty thousand taka only) for each injury case.
GCC 40.1	Commencement Date of Works shall be as follows;	
GCC 42.1	The Contractor shall submit a Programme for the Works within 15 (Fifteen)	

	days of signing the Contract.
GCC 42.2	The period between Programme updates is Every 1 (One) Month.
GCC 42.3	The amount to be withheld for late submission of an updated Programme is BDT 100,000.
GCC 57.1	The Defects Liability Period is 12 (Twelve) months.
GCC 66.3	The particulars of the Bank Account nominated are as follows : Title of the Account : [insert title to whom the Contract awarded] Name of the Bank : [insert name with code, if any] Name of the Branch : [insert branch name with code ,if any] Account Number : [insert number] Address : [insert location with district] Tel : Fax : e-mail address : *[information furnished by the Contractor shall be substantiated by the concerned Bank and authenticated by the Procuring Entity]*
GCC 69.1(m)	The following additional events shall also be the Compensation Events: None.
GCC 71.1	The Contract is not subject to price adjustment.
GCC 72.1	The proportion of payments to be retained is 5 (five) percent.

GCC 73.1	The amount of Liquidated Damages or in other words Delay Damages for the uncompleted Works or any part thereof is 0.05 of ONE (1) percent of its Contract price per day of delay. **<u>Guide to application of GCC Sub Clause 73.1 above</u>** ***[Liquidated damages is equivalent to an amount to be determined in accordance with the following formula*** $T_{LD} = V_{UW} \times P \times n$ ***Where;*** T_{LD} ***= Total amount of Liquidated Damages*** V_{UW} ***= Value of Uncompleted Works (i.e. works not having been completed as of the expiry of the Intended Completion Date plus the works completed after the expiry of the Intended Completion Date). V_{UW} shall be calculated by deducting the value of the completed works under the Contract from the total Contract price*** P ***= Percent-rate at which the Liquidated Damages shall be imposed for every day of delay*** n ***= No of days of delay for completion of works under the Contract]***
GCC 73.1	The maximum amount of Liquidated Damages for the uncompleted Works or any part thereof is 10 (Ten) percent of the final Contract price of the whole of the Works.
GCC 74.1	The Bonus for the whole of the Works is *[insert percentage]* percent of the final Contract price per day : Not Applicable. The maximum amount of Bonus for the whole of the Works is *[insert percentage]* percent of the final Contract price: Not Applicable.
GCC 75.1	The Advance Payment shall be Tk 10% of the contract value and shall be paid to the Contractor not later than 14 days from the date of contract signing.
GCC 77.2	The percentage for adjustment of Provisional Sums is None.
GCC 84.1	The date by which "**as-built**" drawings are required is within 30 days after substantial completion of works.

	The date by which operating and maintenance manuals are required is within 30 days after substantial completion of works.
GCC 84.2	The amount to be withheld for failing to produce "**as-built**" drawings and/or operating and maintenance manuals by the date specified in GCC Sub Clause 84.1, the taka 50 (Fifty) lac will be withhold.
GCC 90.1	The percentage to apply to the contract value of the works not completed, representing the Procuring Entity's additional cost for completing the uncompleted Works, is 20 percent.
GCC 94.2 (b)	The Adjudicator jointly appointed by the parties is: Name: Address: Tel No: Fax No: e-mail address:
GCC 94.2(b)	In case of disagreement between the parties, the Appointing Authority for the Adjudicator is Executive Chairman, Bangladesh Economic Zones Authority (BEZA).
GCC 94.3 (b)	The arbitration shall be conducted in the place mentioned below: Dhaka, Bangladesh.

Section 5. Tender and Contract Forms

Form	Title
	Tender Forms
PW3 – 1	Tender Submission Letter
PW3 – 2	Tenderer Information
PW3 – 3	JV Partner Information (*if applicable*)
PW3 – 4	Subcontractor Information (*if applicable*)
PW3 – 5	Personnel Information
PW3 – 6	Bank Guarantee for Tender Security (*when this option is chosen*)
	Contract Forms
PW3 – 7	Notification of Award
PW3 – 8	Contract Agreement
PW3 – 9	Bank Guarantee for Performance Security (*when this option is chosen*)
PW3 –10	Bank Guarantee for Advance Payment (*if applicable*)
PW3 –11	Bank Guarantee for Retention Money Security (*when this option is chosen*)

Forms **PW3 -1** to **PW3 -6** comprises part of the Tender Format and should be completed as stated in ITT Clauses 24.

Forms **PW3 -7** to **PW3 -11** comprises part of the Contract as stated in GCC Clause 6.

Tender Submission Letter (Form PW3-1)

[The Tenderer must prepare the Tender Submission Letter in its letterhead.]

[Note: All italicized text is for use in preparing this form and shall be deleted from the final letter]

To:	Date:
[Contact Person]	
[Name of Procuring Entity]	
[Address of Procuring Entity]	
Invitation for Tender No:	*[indicate IFT No]*
Tender Package No:	*[indicate Package No]*
This Package is divided into the following Number of Lots	*[indicate number of Lot(s)]*

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Tender Document, including Addenda issued in accordance with Instructions to Tenderers (ITT) clause 11;

(b) We offer to execute in conformity with the Tender Document the following Works and Physical Services:
;

(c) The total price of our Tender, excluding any discounts offered in item (d) below is:
;

(d) The discounts offered and the methodology for their application are:

;

(e) Our Tender shall be valid for a period of [***Insert Validity Period as specified in ITT sub-clause 33.1***]_____ days from the date fixed for the tender submission deadline in accordance with the Tender Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) If our Tender is accepted, we commit to obtain a Performance Security in accordance with the Tender Document;

(g) We, including any subcontractors or suppliers for any part of the contract, have or will have nationalities from eligible countries, in accordance with ITT sub-clause 5.1;

(h) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITT sub-clause 5.5;

(i) We are not participating, as a Tenderer or as a subcontractor, in more than one Tender in this Tendering process in accordance with ITT sub-clause 20.1, other than alternative offers submitted in accordance with ITT clause 26;

(j) We, our affiliates or subsidiaries, including any of our subcontractors or suppliers for any part of the contract, have not been declared ineligible by the Bank, under the laws of Bangladesh or official regulations or by an act of compliance with a decision of the United Nations Security Council on charges of engaging in corrupt, fraudulent, collusive, coercive or obstructive practices in accordance with ITT sub clause 5.6;

(k) We confirm that we do not have a record of poor performance as stated in ITT sub clause 5.7, and that we do not have, or have had, any litigation against us, other than that stated in the Tenderer Information (Form PW3-2);

(l) We are not a government owned entity / We are a government owned entity but meet the requirements of ITT sub clause 5.3;

(m) We understand that this Tender, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed;

(n) We understand that you are not bound to accept the lowest evaluated Tender or any other Tender that you may receive; and

(o) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Signature:	*[insert signature of authorised representative of the Tenderer]*
Name:	*[insert full name of signatory]*
In the capacity of:	*[insert capacity of signatory]*
Duly authorised to sign the Tender for and on behalf of the Tenderer	*[insert the Name of Tenderer]*

Attachment 1: ***[****ITT Sub Clause 40.3,*
Written confirmation authorising the above signatory(ies) to commit the Tenderer]

[and, if applicable]
Attachment 2: *[ITT Sub Clause 29.2(b),*
Copy of the JVCA Agreement / Letter of Intent to form JVCA with draft proposed Agreement]

Tenderer Information (Form PW3-2)

[This Form should be completed only by the Tenderer]

Invitation for Tender No: *[indicate IFT No]*

Tender Package No: *[indicate Package No]*

This Package is divided into the following Number of Lots: *[indicate number of Lot(s)]*

1.	Eligibility Information of the Tenderer [ITT –Clauses 5 & 29]	
1.1	Nationality of individual or country of registration	
1.2	Tenderer's legal title	
1.3	Tenderer's registered address	
1.4	Tenderer's legal status *[complete the relevant box]*	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Government-owned Enterprise	
	Others [please describe, if applicable]	
1.5	Tenderer's year of registration	
1.6	Tenderer's authorised representative details	
	Name	
	National ID number	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1.7	Litigation [ITT Cause 13]	
	If there is no history of litigation or no pending litigation then state opposite "None". If there is a history of litigation, or a number of awards, against the Tenderer provide	

	details below				
	A. Arbitration Awards made against				
	Year	Matter in dispute		Value of Award	Value of Claim
	B. Arbitration Awards pending				
	Year	Matter in dispute		Value of Claim	
1.8	Tenderer to attach photocopies of the original documents mentioned aside		[All documents required under ITT Clauses 5 and 29]		
The following two information are applicable for National Tenderers					
1.9	Tenderer's Value Added Tax Registration (VAT) Number				
1.10	Tenderer's Tax Identification Number(TIN)				
[The foreign Tenderers, in accordance with ITT Sub Clause 5.1, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]					
2.	Qualification Information of the Tenderer [ITT Clause 32]				
2.1	General Experience in Construction Works of Tenderer				
	Start Month Year	End Month Year	Years	Contract No and Name of Contract Name and Address of Procuring Entity Brief description of Works	Role of Tenderer [Prime/Sub/Management]
2.2	Specific Experience in Construction Works of Tenderer Completed Contracts of similar nature, complexity and methods/construction technology				
	Contract No		[insert reference no] of [insert year]		

	Name of Contract	[insert name]		
	Role in Contract *[tick relevant box].*	Prime Contractor	Subcontractor	Management Contractor
	Award date Completion date Total Contract Value	[insert date] [insert date] [insert amount]		
	Procuring Entity's Name Address Tel / Fax e-mail Brief description with justifications of the similarity compared to the Procuring Entity's requirements	[state justification in support of its similarity compared to the proposed works]		

2.3	Average annual construction turnover [ITT Sub Clause15.1(a)] *[amount invoiced to Procuring Entity(s) for each year of works in progress or completed, using rate of exchange at the end of the period reported]*		
	Year	Amount & Currency	Taka or Equivalent Taka
2.4	Financial Resources available to meet the construction cash flow [ITT Sub Clause 15.1(b)]		
	No	Source of Financing	Amount Available

In order to confirm the above statements the Tenderer shall submit , as applicable, the documents mentioned in ITT Sub Clause 32.1(a), (b), (c) & (d)	
2.5	Contact Details [ITT Sub Clause 32.1 (g) & (i)
	Name, address, and other contact details of Tenderer Bankers and other Procuring Entity(s) that may provide references, if contacted by this Procuring Entity
2.6	Qualifications and experience of key technical and administrative personnel proposed for Contract administration and management [ITT Sub Clause 32.1(e)]

	Position Name Years of General Experience	Years of Specific Experience
[*Tenderer to complete details of above. The Tenderer should complete the Personnel Information Form (Form PW3-5*)]		

2.7	Major Construction Equipments proposed to carry out the Contract [ITT Sub Clause 32.1(f)]		
	Item of Equipment	Condition (new, good, average, poor)	Owned, leased or to be purchased (state owner, lessor or seller)
[Tenderer to list details of each item of major construction equipment, as applicable]			

JVCA Partner Information (Form PW3-3)

[This Form should be completed by each JVCA partner].

Invitation for Tender No: *[indicate IFT No]*

Tender Package No *[indicate Package No]*

This Package is divided into the following Number of Lots *[indicate number of Lot(s)]*

1.	Eligibility Information of the JVCA Partner [*ITT –Clauses 5 & 29]*	
1.1	Nationality of Individual or country of Registration	
1.2	JVCA Partner's legal title	
1.3	JVCA Partner's registered address	
1.4	JVCA Partner's legal status *[complete the relevant box]*	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Government-owned Enterprise	
	Other (please describe, if applicable)	
1.5	JVCA Partner's year of registration	
1.6	JVCA Partner's authorised representative details	
	Name	
	National ID number	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1.7	Litigation [ITT Sub Cause 13]	
	If there is no history of litigation or no pending litigation then state "None". If there is	

	a history of litigation, or a number of awards, against the JVCA Partner provide details below:			
	A. Arbitration Awards made against			
	Year	Matter in dispute	Value of Award	Value of Claim
	B. Arbitration Awards pending			
	Year	Matter in dispute	Value of Claim	

1.8	JVCA Partner to attach copies of the original documents mentioned aside	[All documents required under ITT Clauses 5 and 29]
The following two information are applicable for national JVCA Partners only		
1.9	JVCA Partner's Value Added Tax Registration (VAT) Number	
1.10	JVCA Partner's Tax Identification Number (TIN)	
[*The foreign JVCA Partners, in accordance with ITT Sub Clause 5.1, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]*		

2. Key Activity(ies) for which it is intended to be joint ventured [ITT Sub Clause 18.2 & 18.3]		
	Elements of Activity	Brief description of Activity

3. Qualification Information of the JVCA Partner [ITT Clause 32]					
3.1	General Experience in Construction Works of JVCA Partner				
	Start Month Year	End Month Year	Years	Contract No and & Name of Contract Name and Address of Procuring Entity Brief description of Works	Role of JVCA Partner [Prime/Sub/Management]

3.2	Specific Experience in Construction Works of JVCA Partner Completed Contracts of similar nature, complexity and methods/construction technology				
	Contract No Name of Contract	[insert reference no] of [insert year] [insert name]			
	Role in Contract [tick relevant box]	Prime Contractor	Subcontractor	Management Contractor	
	Award date Completion date Total Contract Amount	[insert date] [insert date] [insert amount]			
	Procuring Entity's Name Address Tel / Fax e-mail Brief description with justifications of the similarity compared to the Procuring Entity's requirements	[state justification in support of its similarity compared to the proposed works]			
3.3	Average annual construction turnover [ITT Sub Clause 15.1 (a)] *[amount invoiced to Procuring Entity(s) for each year of work in progress or completed, using rate of exchange at the end of the period reported]*				
	Year	Amount & Currency	Taka or Equivalent Taka		

3.4	Financial Resources available to meet the construction cash flow [ITT Sub-Clause 15.1(b)]		
	No	Source of financing	Amount available
	In order to confirm the above statements the JVCA Partner shall submit , as applicable, the documents mentioned in ITT Sub Clause 32.1 (a), (b), (c) & (d)		
3.5	Contact Details [ITT Sub Clause 32.1 (g) & (i)		
	Name, address, and contact details of Tenderer's Bankers and other Procuring Entity(s) that may provide references if contacted by this Procuring Entity		

3.6	Qualifications and experience of key technical and administrative personnel proposed for Contract administration and management [ITT Sub Clause 32.1(e)]		
	Position Name Years of General Experience	Years of Specific Experience	
	[Tenderer to complete details of above. The Tenderer should complete the Personnel Information Form (Form PW3-5)]		
3.7	Major items of Construction Equipment proposed for carrying out the works [ITT Sub-Clause 32.1(f)]		
	Item of Equipment	Condition (new, good, average, poor)	Owned, leased or to be purchased (state owner, leaser or seller)
[Tenderer to list details of each item of Major equipment, as applicable]			

Subcontractor Information (Form PW3-4)

[This Form should be completed by each Subcontractor, preferably on its Letter-Head Pad]

Invitation for Tender No: *[indicate IFT No]*

Tender Package No *[indicate Package No]*

This Package is divided into the following Number of Lots *[indicate number of Lot(s)]*

1.	Eligibility Information of the Subcontractor [*ITT –Clauses 5 & 29]*	
1.1	Nationality of Individual or country of Registration	
1.2	Subcontractor's legal title	
1.3	Subcontractor's registered address	
1.4	Subcontractor's legal status *[complete the relevant box]*	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Government-owned Enterprise	
	Other (please describe)	
1.5	Subcontractor's year of registration	
1.6	Subcontractor's authorised representative details	
	Name	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1.7	Subcontractor to attach copies of the following original documents	All documents to the extent relevant to ITT Clause 5 and 29 in support of its qualifications
The following two information are applicable for national Subcontractors		
1.8	Subcontractor's Value Added Tax	

	Registration (VAT) Number	
1.9	Subcontractor's Tax Identification Number(TIN)	
[The foreign Subcontractors , in accordance with ITT sub Clause 5.1, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]		
2. Key Activity(ies) for which it is intended to be Subcontracted [ITT Sub Clause 19.1]		
2.1	Elements of Activity	Brief description of Activity
2.2	List of Similar Contracts in which the proposed Subcontractor had been engaged	
	Name of Contract and Year of Execution Value of Contract Name of Procuring Entity Contact Person and contact details Type of Work performed	

Personnel Information (Form PW3-5)

[To be filled in for each person proposed by the Tenderer on Form PW3-2 & PW3-3, where applicable]

Invitation for Tender No:	*[indicate IFT No]*
Tender Package No	*[indicate Package No]*
This Package is divided into the following Number of Lots	*[indicate number of Lot(s)]*

A.	**Proposed Position** (tick the relevant box)		
☐ Construction Project Manager	☐ Prime Candidate	☐ Alternative Candidate	
☐ Key Personnel	☐ Prime Candidate	☐ Alternative Candidate	
B.	**Personal Data**		
Name			
Date of Birth			
Years overall experience			
National ID Number, if applicable			
Years of employment with the Tenderer			
Professional Qualifications: 1. 2. 3. 4.			
C.	**Present Employment** *[to be completed only if not employed by the Tenderer]*		
Name of Employer			
Address of Employer:			
Present Job Title:			
Years with present Employer			

Tel No:	Fax No:	e-mail address:
Contact *[manager/personnel officer]:*		

D. Professional Experience			
Summarise professional experience over the last twenty years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.			
	From	To	Company / Project / Position / Relevant technical and management experience.
1			
2			
3			
4			
5			

Bank Guarantee for Tender Security (Form PW3-6)

[This is the format for the Tender Security to be issued by a scheduled Bank of Bangladesh in accordance with ITT Clause 35 & 36. All italicized text is for guidance on how to prepare this guarantee and shall be deleted from the final document]]

Invitation for Tender No: Date:

Tender Package No:

To:

[Name and address of the Procuring Entity**]**

TENDER GUARANTEE No:

We have been informed that *[name of Tenderer]* (hereinafter called "the Tenderer") intends to submit to you its Tender dated *[date of Tender]* (hereinafter called "the Tender") for the execution of the Works of *[description of works]* under the above Invitation for Tenders (hereinafter called "the IFT").

Furthermore, we understand that, according to your conditions, the Tender must be supported by a Bank Guarantee for Tender Security.

At the request of the Tenderer, we *[name of bank]* hereby irrevocably undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of Tk *[insert amount in figures and words]* upon receipt by us of your first written demand accompanied by a written statement that the Tenderer is in breach of its obligation(s) under the Tender conditions, because the Tenderer:

a. has withdrawn its Tender after opening of Tenders but within the validity of the Tender Security; or
b. refused to accept the Notification of Award (NOA); or
c. failed to furnish Performance Security; or

failed or refused to sign the Contract Agreement

This guarantee will expire

(a) if the Tenderer is the successful Tenderer, upon our receipt of a copy of the Contract Agreement signed by the Tenderer and the a copy of the Performance Security issued to you in accordance with the ITT; or
(b) if the Tenderer is not the successful Tenderer, twenty eight (28) days after the expiration of the Tenderer's Tender validity period.

Consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Signature Seal of Bank and Signature

Sample Notification of Award (Form PW3-7)

Contract No: Date:
To:

[Name of Contractor]

This is to notify you that your Tender dated *[insert date]* for the execution of the Works for *[name of project/Contract]* for the Contract Price of Tk *[state amount in figures and in words]*, as corrected and modified in accordance with the Instructions to Tenderers, has been approved by *[name of Procuring Entity].*

You are requested to:

i. accept in writing the Notification of Award within seven (7) working days of its issuance pursuant to ITT Sub Clause 63.1

ii. furnish a Performance Securityin the form as specified and in the amount of Tk *[state amount in figures and words]* ,within fourteen (14) days of acceptance of this Notification of Award but not later than *(specify date),* in accordance with ITT Clause 65.

iii. sign the Contract within twenty-eight (28) days of issuance of this Notification of Award but not later than *(specify date),* in accordance with ITT Sub Clause 69.2.

We attach the draft Contract and all other documents for your perusal and signature.

Signed

Duly authorised to sign for and on behalf of *[name of Procuring Entity]*

Date:

Contract Agreement (Form PW3-8)

THIS AGREEMENT made the *[day]* day of *[month] [year]* between *[name and address of Procuring Entity]* (hereinafter called "the Procuring Entity") of the one part and *[name and address of Contractor]* (hereinafter called "the Contractor") of the other part:

WHEREAS the Procuring Entity invited Tenders for certain works, viz, *[brief description of works]* and has accepted a Tender by the Contractor for the execution of those works in the sum of Taka *[Contract price in figures and in words]* (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 General Conditions of Contract hereafter referred to.

2. The documents forming the Contract shall be interpreted in the following order of priority:
   (a) the signed Contract Agreement
   (b) the Notification of Award
   (c) the completed Tender and the appendices to the Tender
   (d) the Particular Conditions of Contract
   (e) the General Conditions of Contract
   (f) the Technical Specifications
   (g) the General Specifications
   (h) the Drawings
   (i) the priced Bill of Quantities and the Schedules
   (j) any other document listed in the PCC forming part of the Contract.

3. In consideration of the payments to be made by the Procuring Entity to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Procuring Entity to execute and complete the works and to remedy any defects therein in conformity in all respects with the provisions of the Contract.

4. The Procuring Entity hereby covenants to pay the Contractor in consideration of the execution and completion of the works 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 the laws of Bangladesh on the day, month and year first written above.

For the Procuring Entity	For the Contractor
Signature	
Name	
National ID No. Title	
In the presence of Name	
Address	

Bank Guarantee for Performance Security (Form PW3-9)

[This is the format for the Performance Security to be issued by a scheduled bank of Bangladesh in accordance with ITT Clause 64, 65, 66 & 67. All italicized text is for guidance on how to prepare this guarantee and shall be deleted from the final document]

Contract No: [insert reference number] Date: [insert date]

To:

[insert Name and address of Procuring Entity]

PERFORMANCE GUARANTEE No:

We have been informed that *[name of Contractor]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[insert reference number of Contract]* dated *[insert date of Contract]* (hereinafter called "the Contract"), the execution of works *[description of works]* under the Contract.

Furthermore, we understand that, according to your conditions, the Contract must be supported by a Bank Guarantee for Performance Security.

At the request of the Contractor, we *[name of bank]* hereby irrevocably undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of Tk *[insert amount in figures and in words]* upon receipt by us of your first written demand accompanied by a written statement that the Contractor is in breach of its obligation(s) under the Contract conditions, without you needing to prove or show grounds or reasons for your demand of the sum specified therein.

This guarantee is valid until *[insert date of validity of guarantee which should be twenty-eight days after the expected completion date; in case of extension of the time of completion, the Procuring Entity would need to get this guarantee extended]*, consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Signature Seal of the Bank and Signature

Bank Guarantee for Advance Payment (Form PW3-10)

[This is the format for the Advance Payment Guarantee to be issued by a scheduled bank of Bangladesh in accordance with GCC Clause 75. All italicized text is for guidance on how to prepare this guarantee and shall be deleted from the final document]]

Contract No: [insert reference number] Date: [insert date]

To:

[insert Name and address of the Procuring Entity]

ADVANCE PAYMENT GUARANTEE No:

We have been informed that *[name of Contractor]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[insert reference number of Contract]* dated *[insert date of Contract]* (hereinafter called "the Contract"), the execution of works *[description of works]* under the Contract.

Furthermore, we understand that, according to your Conditions of Contract under GCC Clause 75, the Advance Payment on Contract must be supported by a Bank Guarantee.

At the request of the Contractor, we *[insert name of bank]* hereby irrevocably undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of Tk *[insert amount in figures and in words]* upon receipt by us of your first written demand accompanied by a written statement that the Contractor is in breach of its obligation(s) under the Contract conditions, without you needing to prove or show grounds or reasons for your demand of the sum specified therein.

We further agree that no change, addition or other modification of the terms of the Contract to be performed, or of any of the Contract documents which may be made between the Procuring Entity and the Contractor, 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 is valid until *[insert date of validity of guarantee]*, consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Signature Seal of the Bank and Signature

Bank Guarantee for Retention Money Security (Form PW3-11)

[This is the format for the Retention Money Guarantee to be issued by a scheduled bank of Bangladesh in accordance with GCC Sub Clause 72.3. All italicized text is for guidance on how to prepare this guarantee and shall be deleted from the final document]]

Demand Guarantee

[Bank's Name, and Address of Issuing Branch or Office]

Beneficiary: *[insert Name and Address of the Procuring Entity]*

Date: *[insert date]*

RETENTION MONEY GUARANTEE No.: [insert number]

We have been informed that *[insert name of Contractor]* (hereinafter called "the Contractor") has entered into Contract Number *[insert reference number of the Contract]* dated [insert date] with you, for the execution of *[insert name of Contract and brief description of Works] (*hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment, payment of Tk. [insert the amount of the second half of the Retention Money] which becomes due after the Defects Liability Period has passed and certified in the form of Defects Correction Certificate, is to be made against a Retention Money Guarantee.

At the request of the Contractor, we *[insert name of Bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of Tk. *[insert amount in figures]* (Taka [insert amount in words]) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor failed to properly correct the defects duly notified in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the payment of the second half of the Retention Money referred to above must have been received by the Contractor on its account number*[insert A/C no] at [name and address of Bank].*

This guarantee is valid until *[insert the date of validity of Guarantee that being twenty eight (28) days beyond the Defects Liability Period]*. Consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Signature Seal of Bank and Signature

Section 6. Bill of Quantities

Preamble to Bill of Quantities

1. The complete description for the work items listed in the Bill of Quantities is given in Section-06 of the Bid Documents.

2. The works shall be measured in accordance with the Measurement and Payment Sub-Clauses given at the end of each section of the specifications unless otherwise stated, together with any additional items included in the Bill of Quantities. The rates for these items should include all costs, including work of an ancillary or temporary nature, Test Fees, overheads and profit, required by the Bidder and shall (except insofar as is otherwise provided in the Contract) cover all his obligations under the Contract for the complete construction and maintenance of the works.

3. The quantities shall be computed net. In measuring earthworks no allowance shall be made for temporary batters, working space, shoring, Temporary works or bulking of the soil and the Bidder should make due allowance in his rates.

4. Payment for pre-cast piles shall be made in separate items for supplying and driving as per contract prices and units, concrete, reinforcement, pile shoe items shall be included.

5. The rates inserted against each item are to include for the provision and operation of all equipment necessary to meet the specifications. The Bidder shall be responsible for supplying the equipment.

6. The Bidder should not assume that equipment will be available from the BEZA and shall allow for obtaining equipment from other sources.

7. If the Bidder fails to enter a price against an item in the Bill of Quantities the amount shall be deemed to be included elsewhere in his rates.

8. The Bidder's attention is drawn to Clauses of the Conditions of Contract, which deal with variations in quantities.

9. No additional item of work of any nature shall be undertaken before a written order by the Engineer has been issued to the Bidder in this respect and a rate agreed. If there is no agreement between the Bidder and the Engineer on the rate, then the Engineer may instruct the Bidder to proceed with the work at a rate fixed by the Engineer.

10. The Bidder is responsible for ensuring the necessary tests and measurements are carried out field and at the laboratory fixed by BEZA in order to ensure that the work complies with the specifications. The Bidder shall give 24 hours notice of each item of work, which is due for testing. Any item of work, which is covered or buried without tests being carried out, may be rejected by the Engineer. Bidder's quoted rate for each item of work shall be inclusive of such test fees.

11. Only materials and work complying fully with all specified requirements shall be eligible for payment under the Contract.

12. Usable materials salvaged from within the site are the property of the BEZA and shall be applied to the works as indicated in the Bill of Quantities.

Bill of Quantities
Name of Works: Interior works and HVAC system installation for BEZA in Administrative Building in BSMSN
IFT No. 01/2020-21, Package No. : BEZA WD-1802 B, Lot No. : 01

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
1	Supplying, fitting and fixing foreign (China or equivalent) made polished porcelain/ mirror polished/Glazed porcelain homogeneous floor tiles complying BDS ISO 13006: 2015, water absorption ≤ 0.5%, modulus of rupture (MOR) ≥ 35 N/mm2, irrespective of color &/or design, with cement sand (F.M. 1.2) mortar (1:4) base and raking out the joints with white cement including cutting and laying the tiles in proper way and finishing with care etc. all complete and accepted by the Engineer-in-charge. (Cement: CEM-II/A-M) In ground floor. Polish porcelain/ mirror polished/ Glazed porcelain (Marbel Shaded) 600 mm x 1200 mm floor tiles	Sqm	6020.59				
2	Supplying, fitting and fixing foreign (China or equivalent) made glazed wall tiles complying BDS ISO 13006: 2015, irrespective of color &/or design, with 20 mm thick cement sand (F.M. 1.2) mortar (1:3) base and raking out the joints with white cement including cutting, laying and hire charge of machine and finishing with care etc. including water, electricity and other charges complete in all respect and accepted by the Engineer-in-charge. (Cement: CEM-II/A-M). In ground floor. Glazed wall tiles 600 mm x 2400 mm	Sqm	1125.60				
3	Supplying, fitting and fixing foreign (China or equivalent) made glazed wall tiles complying BDS ISO 13006: 2015, irrespective of color &/or design, with 20 mm thick cement sand (F.M. 1.2) mortar (1:3) base and raking out the joints with white cement including cutting, laying and hire charge of machine and finishing with care etc. including water, electricity and other charges complete in all respect and accepted by the Architect-in-charge. (Cement: CEM-II/A-M). In ground floor. Glazed	Sqm	75.00				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	feature wall tiles (600 mm x 1200 mm, 800X800 mm, 450X900 mm, 300X600 mm, 200X 1200mm & if any other tiles according to the design of architect)						
4	Supplying, fitting and fixing foreign (China or equivalent) made GP homogeneous stair tiles having non skidding offsets, complying BDS ISO 13006: 2015, water absorption ≤ 0.5%, modulus of rupture (MOR) ≥ 27 N/mm2, irrespective of color &/or design, with cement sand (F.M. 1.2) mortar (1:4) base and raking out the joints with white cement including cutting and laying the tiles in proper way and finishing with care etc. all complete and accepted by the Engineer-in-charge. (Cement: CEM-II/A-M) In ground floor. Glazed stair tiles of size 300 mm x 600 mm, anti slip.	Sqm	443.95				
5	Supplying, fitting and fixing plain particle board / MDF board ceiling (complying unit wt 499 to 550 kg/m3, bending strength 0.35 N/mm2, max swelling 8%, moisture content not more than 10%), of 12 mm thick with best quality and well seasoned Garjan wood frame of section 70 mm x 30 mm at 600 mm x 600 mm in grid suspended from ceiling or roof or beam by 12 SWG double ply G.I. wire fixed to the ceiling by rowel plug, screws, hooks, nails etc, maintaining straight lines and desired finished level at bottom face including vertical strut as required, cutting holes in slabs or beams by electric drill machine and mending good the damages, if any during execution of the work, also including cost and carriage of all materials, accessories, labour for installation, electricity charge, scaffolding, screws, nails, Duco Paint over a coat of priming etc. all complete, as per drawing design and accepted by the Engineer-in-charge.	Sqm	731.51				
6	Supplying, fitting and fixing of 0.7 mm thick perforated/plain Metal board false ceiling with aluminum frame suspended from ceiling false ceiling of size 600 mm x 600 mm, powder coated of approved design, framing by aluminium T-bar of natural anodized finish suspended in 600 mm x 600 mm grid from ceiling by 12 SWG	Sqm	1360.18				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	double ply wire, fixed to the ceiling by rowel plug, screws, hooks, nails etc., maintaining straight lines and desired finished level at bottom face including vertical wooden strut as required, making holes in slabs or beams by electric drill machine and mending good the damages, if any during execution of the work, also including cost of all materials, electricity, accessories, scaffoldings, labour for installation, screws, nails, etc. all complete as per drawing, design and accepted by the Engineer-in-charge.						
7	Supplying, fitting and fixing 12 mm thick burma teak (BT) veneered board in walling with best quality and well seasoned garjan wood frame of section 70 mm x 30 mm at 600 x 600 mm in grid, fitted and fixed to wall by plugs, nails, screws etc. including treatment of inner surface with termite and damp proofing agent maintaining leveled and finished exposed faces including. making holes in wall and mending good the damages, if any during execution of the work, also including cost and carriage of all materials, electricity, accessories, labour for installation, scaffolding, screws, nails etc. including Duco Paint over a coat of priming etc. all complete as per design, approved sample and accepted by the Engineer-in-charge.	Sqm	456.03			
8	Supplying, fitting and fixing stainless steel (SS) stair railing of standard height with 2 mm thick 62 mm dia pipe for hand-rail, 6 nos 62 mm x 50 mm x 2 mm vertical box in each flight, 2 mm thick 25 mm dia 5 nos horizontal pipes as per drawing, design including carrying, polishing fabricating, welding and fixing with tread by 25 mm long royal bolt etc. all complete and accepted by the Engineer-in-charge.	Sqm	45.15				
9	Supplying, fitting and fixing 10 mm thick tempered glass railing in stair with 62 mm dia 2 mm thick SS pipe for hand rail, 2 nos 62 mm x 50 mm x 2 mm vertical pipe in each flight & 3 nos 62 mm x 50 mm x 2 mm vertical pipe in each landing fitted and fixed with 65 mm x 55 mm x 6 mm SS base plate including welding, bending, fabricating, polishing all complete as per drawing, desing and specification	Sqm	588.50				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	etc all complete in all respect and accepted by Engineer-in-charge.						
10	Supplying, fitting and fixing 10 mm thick clear tempered glass door including all accessories, 1 set floor mounted auto door closure, special quality 2 nos. clamping devices, 1 set locking device, top hinge and handle etc. complete in all respect as per drawing and direction of the Engineer-in-charge.	Sqm	132.50				
11	Supplying, fitting and fixing of 10 mm thick clear tempered glass wall upto 3.0 m height with vertical fin glass support of same thickness and support shall be at least 1.2 m c/c fixed properly with glass by silicon glue with supply and fittings of all required accessories such as SS u channel, nut bolts, aluminium angle, steel rowel bolt, screws , rivets norton tape masking tape, structural sealant, gum bracket rod etc. all complete in all respect as per drawing and direction of the Engineer-in- charge.	Sqm	677.50				
12	Supplying, fitting and fixing 38 mm thick finished well matured seasoned (minimum 250 mm wide plank) wooden grooved single panel flush door shutters with top and middle rail 100 mm x 38 mm, bottom rail 225 mm x 38 mm and style 100 mm x 38 mm, having vertical panels 100 mm x 38 mm including keeping 6 mm x 12 mm even groove all around and minimum 12 mm grooved lap to each panel. Providing 4 (four) nos best quality 100 mm long iron hinges, 12 mm dia best quality 200 mm and 250 mm long iron socket and tower bolts, 2 (two) nos heavy type best quality nickel plated handles long, 1 (one) no best quality hasp bolt, hinged cleats, 1 Door closer, wooden buffer blocks including supply of necessary nails and screws, finishing by sand papering etc. complete in all floors as per drawing and accepted by the Engineer-in-charge. (All sizes of wood are finished).	Sqm	35.10				
13	Add for each additional floor up to 5th floor	Sqm	5720.73				
14	Supplying, fitting and fixing 10 mm thick tempered glass railing in verandah with 62 mm dia 2 mm thick SS pipe for hand rail, 5 nos 62 mm x 50 mm x 2 mm vertical box fitted with concrete slab by 65 mm x 55 mm x 6	Sqm	152.76				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	mm SS plate @ 600 mm c/c including all fittings, fixtures as per drawing, desing and specification etc all complete in all respect and accepted by Engineer-in-charge.						
15	Supplying, fitting and fixing 18 mm thick burma teak (BT) veneered board louver ceiling (complying unit wt 499 to 550 kg/m3, bending strength 0.35 N/mm2, max swelling 8%, moisture content not more than 10%), with best quality and well seasoned Garjan wood frame of section 75 mm x 38 mm at 600 mm x 600 mm in grid suspended from ceiling or roof or beam by 12 SWG double ply G.I. wire fixed to the ceiling by rowel plug, screws, hooks, nails etc, maintaining straight lines and desired finished level at bottom face including vertical strut as required, cutting holes in slabs or beams by electric drill machine and mending good the damages, if any during execution of the work, also including cost and carriage of all materials, accessories, labour for installation, electricity charge, scaffolding, screws, nails, including Duco Paint by 2 coats over a coat of priming etc. all complete, as per drawing design and accepted by the Engineer-in-charge.	Sqm	78.08				
16	Supplying, fitting and fixing 12 mm thick MDF Jali over 12mm thick Gorjon ply board in walling with best quality and well seasoned garjan wood frame of section 70 mm x 30 mm at 600 x 600 mm in grid, fitted and fixed to wall by plugs, nails, screws etc. including treatment of inner surface with termite and damp proofing agent maintaining leveled and finished exposed faces including. making holes in wall and mending good the damages, if any during execution of the work, also including cost and carriage of all materials, electricity, accessories, labour for installation, scaffolding, screws, nails etc. including Duco Paint over a coat of priming etc. all complete as per design, approved sample and accepted by the Engineer-in-charge.	Sqm	74.78				
17	(i) Square panel ENERGY+ Model: EPPLLED 2001 or equivalent product of ENERGY+ / SUNKO / ENERGYPAC / etc.	nos	160				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	(ii) Rated life: 30,000 hr. (minimum) (iii) luminous flux : 100 + 1m/w (iv) LED chips : EDISON / EPISTAR / OSRAM / PHILIPS / CREE / BRIDGELUX. (v) Driver: MEANWELL / OSRAM / PHILIPS / IEC standard. (vi) Size : 600 mm x 600 mm **48 W (2' x 2')**						
18	(i) GLORIA cat. no.- Gcdl-332 (7 W / 9 W / 12 W)or equivalent product of ENERGYPAC / ENERGY + etc. (ii) Rated life : 30,000 hr. (minimum)(iii) Luminous flux : 100 + 1m/w(iv) LED chips : EDISON / EPISTAR / OSRAM / PHILIPS / CREE/ BRIDGELUX.(v) Driver: MEANWELL / OSRAM / PHILIPS / IEC standard.	nos	612				
19	Supply & fixing of the following LED bulbs & tube lamps manufacturers by ENERGY+ / MEP / HARMONICS / ELECTRO / SUNTEC / GE / TRANSTEC / ENERGYPAC or equivalent brand accepted / approved by the Engineer. **600 mm / 2'- 9 / 10 watt-T5 AC LED tube Lamp**	nos	620				
20	Supply & fixing of LED spot light fitting of the following features and model with all necessary elements such as driver, chips etc. complete. Model & sample shall be approved by the Engineer. (i) Round panel (surface type) ENERGY+ cat. No. - EPPLLED 2006 or equivalent product of GLORIA / SUNKO / ENERGYPAC / ASHA etc. (ii) Rated life: 30,000 hr. (minimum) (iii) luminous flux : 100 + 1m/w (iv) LED chips: EDISON / EPISTAR / OSRAM / PHILIPS / CREE / BRIDGELUX. (v) Driver: MEANWELL / OSRAM / PHILIPS / IEC standard. **24 W**	nos	64				
21	Supply & fixing of LED bath-room light fitting of the following features and model with all necessary elements such as driver, chips etc. complete. Model & sample shall be approved by the Engineer. (i) ENERGY + cat. no. - EPML-10024 or equivalent product of GLORIA / SUNKO / ENERGYPAC etc. (ii) Rated life : 50,000 hr. (minimum) (iii) Luminous flux : 100 + 1m/w (iv) LED chips : EDISON / EPISTAR / OSRAM / PHILIPS / CREE/	nos	48				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	BRIDGELUX. (v) Driver: MEANWELL / OSRAM / PHILIPS / IEC standard.						
22	Providing & fixing the fancy bracket light fitting of the following manufacturer's model & catalogue number with carrier, brass holder, earth terminal, necessary wiring with 2 x 0.4 sq.mm stranded PVC insulated flexible FR cable etc. Suitable for use CFL & LED lamp (except lamp) complete sample accepted / approved by the Engineer. ENERGY+ cat. no. EPWB 3003 / 1 W or equivalent product of GLORIA / SUNKO / CRESCENT / SHWASH / ASHA etc.	nos	40				
23	Providing and fixing single phase distribution board (SPDB) [concealed / surface] having the following components and specifications: [Fig : 4.2] 1. Steel board : size 20"x15"x4" MS sheet : 18SWG with hinged type door and locking arrangement duly painted with powder coating with epoxy polyester resin on all surfaces of board (gray / off-white) etc. Infront side there will be tempered thick fiber glass with rubber gaskets to observe the inside arrangement. 2. Copper bar: size 10"x 1"x 3mm (2 nos.) and 6"x 1"x 3mm (1 no) mounted on insulator capacity: 60-100A at both ends. 3. 1 no. DPSPMCB (main control) and following nos. SPMCB ,DPSPMCB and SPMCB manufactured and tested in accordance with relevant IEC / VDE / NEMA / BS / JIS standard. Minimum breaking capacity 6/10 KA with thermal overcurrent and instantaneous electromagnetic short circuit release. 4. Loop Cable [from phase bar to SPMCB(circuit&power)] size: 1c-1x2.5sqmm (BYM) With DPSPMCB and SPMCB'S of MEM / ABB / HAVELLS / LEGRAND / FEDERAL /HAGER / VITZRO or equivalent brand accepted / approved by the engineer. (Manufactured by RECO / NASCO / C&S or equivalent product of any other manufacturer)	nos	43				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	10-way SPDB incoming : 1x100A DPSPMCB outgoing : 10x5-10A SPMCB						
24	Providing & fixing 250 volt single phase 3-pin combined switch socket outlet (surface / Concealed type) manufactured and tested in accordance with relevant IEC / VDE / NEMA / BS / JIS standards mounted on required size 18 SWG galvanized plain sheet board / Plastic Board (Self-extinguishing 650oC) of 76.2 mm. (3") depth. (Manufacturer shall have certificate of standard which they follow). **13 / 15 / 16 / 20 Amps.** **Made in ENGLAND / GERMANY / JAPAN / USA or EU countries.**	nos	260				
25	Providing & fixing 250 volts. 5 / 6 amps (minimum) concealed type following switch / switch socket manufactured and tested in accordance with relevant IEC / VDE / NEMA / BS / JIS standards mounted on required size 18 SWG galvanized plain sheet / PVC board (Self-extinguishing 650oC) of 76.2 mm (3") depth. All electrical contacts shall be of brass / copper. (Manufacturer shall have certificate of standard which they follow) Four gang switch	nos	36				
26	One gang switch & one 5 amps. 2-pin socket combined.	nos	32				
27	Concealed conduit wiring for following point looping at the switch board with earth terminal with 1C-2x1.5 sqmm PVC insulated and sheathed stranded cable (BYM) & same size PVC insulated ECC (BYA) (Green / White color) including circuit wiring with IC-2x2.5 sqmm PVC insulated and sheathed stranded cable (BYM) & same size PVC insulated ECC (BYA) Green / White color through PVC conduit (one conduit from switch board to common point on ceiling is considered to draw 3 pair of cable) of reputed manufacturer of minimum 25	points	800				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	mm Dia. & 1.5 mm wall thickness complete with 18 SWG GP sheet / PVC switch board & pull box with 3mm thick ebonite sheet cover, without switch, fixing materials etc.(without switch) as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer. Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer. **Light/ exhaust or wall bracket fan point**						
28	Surface conduit wiring with the following PVC insulated and sheathed cable (BYM) & Green / White colour PVC insulated ECC wire (BYA) through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet pull box with 3 mm thick ebonite sheet cover, fixing materials, other accessories etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer. Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer. 1C-2x2.5sqmm (BYM) cable with 2.5 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 25 mm having wall thickness of 1.5 mm	meter	16400				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
29	Concealed conduit wiring with following PVC insulated and sheathed stranded cable (BYM) & PVC insulated Green / White coloured ECC wire (BYA) through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet and pull box with 3mm thick ebonite sheet cover, fixing materials etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer.Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer. 1C-2x10sqmm (BYM) cable with 10 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 25 mm having wall thickness of 1.5 mm	meter	2250				
30	Providing & fixing the chandelier light fitting of following manufacturers model & catalogue number suitable for use CFL / LED lamp, brass holder, cylindrical brass carrier suitable for use with earth terminal, necessary wiring with 2 x 0.4 sq.mm stranded PVC insulated flexible FR cable etc. complete (except lamp) as per sample accepted / approved by the Engineer.	each	4.00				
31	**Air Cooled Water Chiller (VFD Driven) CH-01 & 02** Air Cooled Water Chiller complete with twin Screw Compressor with motor, Built-in starter panel with VFD, Air Cooled Condenser, insulated Evaporator, temperature and pressure indicator, microprocessor control panel, Flow switch, Standard safety devices, spring mounted vibration isolators, charged compressor oil and other accessories. The units Control Panel shall be factory wired and tested. The unit	sets	2				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	shall be complete with Safety and Control devices as specified in Technical Specifications: -Condenser material: Copper Coil with Aluminum Fins -Cooling capacity: 615 kW (175 Ton of Refrigeration) -Chilled water inlet/outlet Temp : 11.56 C / 6 C -Chilled water flow rate: 1589.7 l/min (420 US GPM) -Condenser air inlet temperature: 35 C -Fouling factor for Evaporator: 1.8x10-5 m2.0C/W -Minimum Number of Compressor: 2 -Min Number of Refrigerant Circuit with Gas Locking devices: 2 -IPLV rate: Min 4.5 -Capacity control: Stepless -Guard for Condenser Fins -Refrigerant: R407C / R 134a / R410 or Environ friendly Refrigerant -Power input source : 400+/-10%V, 50 Hz, 3 Ph						
32	**Chiller Plant Manager** It includes Chiller Manager for sequencing of 2 Chillers, 3 Primary Chilled Water Pumps, 3 Secondary Chilled Water pumps to maintain '- equal run time of Chillers. '- constant temperature at Chilled water supply Header '- automatic start of Standby unit in the event of duty unit failure The wotks includes sensors, controllers, BTU Meter, Motorised Solenoid Valves across Chillers, Control Transformer, etc. including Control cabling, conduiting, etc works.	Job	1				
33	**Chilled Water Fan Coil Units** Fan Coil Units shall be complete with EC (Electronically Commutated) fan with continuous operation type motor, cooling coil with Drain and Vent line, Coil drain & Vent port, Remote / Wired Thermostat with two way Solenoid valve and Fan controls (On, Off, High, Low, Medium or Stepless), Control Transformer (if required) , Air Filter, Vibration Isolator, etc complete. -All FCUs shall have built in/Separate Drain Pump. -Entering water temperature : 6 C -Leaving water temperature : 11.56 C -Entering air temperature : DB 25.24 C/WB 19.05 C						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	-Leaving Air temperature : DB 13.5 C/WB13.22 C -Power input : 220+/-10%V, 50 Hz, 1 Ph						
33.1	**Fan Coil Units (FCU CAS)-Ceiling Cassette type** Fresh Air Ports & Flexible Hose pipe: For Fresh Air inlet to Cassette type AC. Flexible pipe corresponding to Fresh air port dia shall be insulated with 15mm thickness PEF insulation pasted with self adhesive Aluminum Foil. Length 1m. -Remote Thermostat with Wall mounting bracket						
33.1.1	Cooling capacity: 2.5 TR	sets	120				
33.1.2	Cooling capacity: 1 TR	sets	2				
33.2	**Fan Coil Units (FCU D)-Ducted Ceiling Hideaway** C/W Extended Drain Pan, duct collar, Return Air Plenum box with Pre-Filter, etc. Cooling capacity 5 Ton, ESP: 50 Pa	sets	3				
33.3	**Fresh Air Fan Coil Unit (Indoor Unit)** Cooling capacity : 4 TR; ESP: 150 Pa; Air Flow Rate : 600 CFM	sets	8				
34.0	**Centrifugal Pumps** Centrifugal type end suction vertical discharge pump complete with base plate, spacer coupled motor, safety cover etc. complete. Motor shall be heavy duty type rated for continuous operation with minimum 15% over rating from BkW. Pump efficiency shall not be less than 60%. Impeller speed shall not be more than 1500 RPM. Power input shall be : 400+/-10%V, 50 Hz, 3 Ph Water temperature: 5 C to 35 C Casing pressure: Min 1600 kPa Accessories: Spring Mounted vibrating Isolator						
34.1	**Primary Chilled Water Pumps (PCHWP-01,02,03)** -Flow rate: 1589.7 l/min -Head: 30 m WG.	sets	3				
34.2	**Secondary Chilled Water Pumps (SCHWP-01, 02, 03)** Flow rate: 1589.7 l/min Head: 35 m WG	sets	3				
35.0	**Pipe accessories** All pipe accessories under this headings shall have withstanding capacity at 10 Kg/Sq. cm pressure. Pipe accessories of dia 50 mm and below shall be threaded end type with						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	bronze/brass body. Pipe accessories above the 50 mm dia shall be of flanged end type.						
35.1	**Butterfly Valve** Butterfly valve shall be made of cast iron body, high corrosion resistant bronze disc, liner, stainless steel stem, self locking mechanism, showing degree of opening by pointer and calibrated notch plate. having arrangement for flange connection with pipes.						
35.1.1	Gear Operated, Dia 150mm	Nos.	10				
35.1.2	Gear Operated, Dia 100mm	Nos.	8				
35.2	**Globe valves** Globe Valves of above 50 mm dia shall have iron body, bolted bonnet, outside screw and yoke rising stem beveled wedge disc and flanged end type with companion flange, galvanized nut bolt and gasket. Valves of 50 mm dia and smaller shall have bronze body, screwed bonnet, rising stem, swivel disc, integral seat. Dia 150mm	Nos.	6				
35.3	**Check Valves (swing type)** -Flanged type Check valves shall have iron body, bolted cover, swivel type disc. -Threaded type check valve shall have bronze body, SS Spring, Resin Disc**.** Dia 150mm	Nos.	6				
35.4	**Y-Strainer** -Flanged type Y-strainer shall have bolted cover, stainless steel screw. -Threaded type Y-Strainer shall have Cast Brass body, SS Strainer**.**						
35.4.1	Dia 150mm	Nos.	6				
35.4.2	Dia 32mm	Nos.	3				
35.4.3	Dia 25mm	Nos.	8				
35.4.4	Dia 20mm	Nos.	122				
35.5	**Flexible Pipe Joints** Flanged type Rubber Flexible joint shall be made of molded neoprene or butyl with Nylon Cord fabric lining. It shall be of single flex spherical shape with floating steel flange. -Screwed type Flexible joint shall be made of molded neoprene or butyl with Nylon Cord fabric lining. It shall be of single flex spherical shape with malleable iron / steel union.						
35.5.1	Dia 150mm	Nos.	16				
35.5.2	Dia 32mm	Nos.	6				
35.5.3	Dia 25mm	Nos.	16				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
35.5.4	Dia 20mm	Nos.	244				
35.6	**Auto Vent Valves** Free floating type Automatic Vent Valve shall have test cock, 20 mm NB threaded outlet and inlet connection to accept drain line and Chilled water inlet connection. It must be located at the top level of all pipe work where there is possibility of Air trap. Require to show position in Shop drawing.	Nos.	6				
35.7	**Gate Valve** Gate valve shall be bronze/brass forged body construction.						
35.7.1	Dia 32mm	Nos.	6				
35.7.2	Dia 25mm	Nos.	28				
35.7.3	Dia 20mm	Nos.	248				
35.8	**Pressure Relief Valve** Threaded type with bronze body. Dia 25mm	No.	1				
35.9	**Non Return Valve** Threaded type check valve shall have bronze body, SS Spring, Resin Disc. Dia 25mm	No.	1				
36.0	**Metering Devices**						
36.1	**Pressure Gauge** 100 mm dia dial type Pressure Gauge shall be complete with pet cock, pressure snubber. Range shall be 0 to 10 Kg/sq. cm. -Type: Bourdon tube Dial type -Casing: Stainless Steel -Weather Proof, IP rating 65	sets	16				
36.2	**Pipe Thermometer** Industrial type direct reading Pipe Thermometer shall be complete with thermometer well. The stem length shall be 3/4th of corresponding pipe sizes. Range shall be 0 to 50 degC.	sets	4				
36.3	**Water Flow Balancing Valve** The contractor must have Water Flow Measuring instruments matching with the valve. Balancing Valve with ports for measuring Water flow rate.						
36.3.1	Dia 150mm (Static Balancing) across each Chiller	Nos.	2				
36.3.2	Dia 100mm (Dynamic Balancing) at each floor	Nos.	4				
36.4	**2-Way motorized Valves** Butterfly valve c/w driving motor shall be made of cast iron body, high corrosion resistant bronze disc, liner, stainless steel stem, self locking lever with locking mechanism showing degree of opening by pointer and calibrated notch plate. having arrangement for flange connection	Nos.	2				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	with pipes. Dia 150mm						
36.5	**Variable Frequency Drive (VFD)** AC Variable Frequency Drive of frequency converter type, complete with Built-in RFI Filter, integrated thermal motor protection, protection against earthing and short circuiting, over current protection, menu based programming system with keypad input facility and LED display, 4-20mA analog output, 10V/24V internal voltage supplies, 0/4-20mA and 0-10v analog input, IP54 enclosure, 3 Phase/415 V 0-120 Hz output, 10V/24V internal voltage supplies, 0/4-20mA and 2-16 kHz variable switching frequency, Static pressure sensor, etc. kW ratings mentioned are approximate. Actual kW rating are to be taken from the fitted kW based on manufacturers software selection of concern equipment.						
36.5.1	for PCHWP (Approx 12 kW)	sets	3				
36.5.2	for SCHWP (Approx 14 kW)	sets	3				
37.0	**Chemical Dosing Pot** Chemical Dosing Pot S.S 304 of 1.6mm thickness with followings: -Capacity: 15 liter -Water inlet SS Ball valve: dia 20mm -Water outlet SS Ball valve: dia 20mm -Drain port (SS Ball valve, dia 20mm) -Chemical inlet funnel with SS Ball Valve, dia 20mm	set	1				
38.0	**Chilled Water Pump insulation with 25mm thick PEF Insulation**	set	1				
39.0	**Fans**						
39.1	**Axial Flow Fan ForVentilation** The details shall be as per Technical Specifications. The control of fan shall be based on signal received from fire alarm panel. The fan capacity shall be as follows: -General Data : -Maximum Fan RPM: 1450 -Maximum sound level: 70 dB at 1 m distance Each unit shall be complete with one set Smoke Detector and two sets of Motorized Damper for by pass control complete in all respect.						
39.1.1	**SAF GF/03 For Generator Room Fresh air inlet Air flow rate : 16990 m3/hr; ESP: 100 Pa**	set	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
39.1.2	**SAF GF/01,02 For H.T. Panel, PFI, X-Former Room Fresh air inlet** Air flow rate : 5098 m3/hr; ESP: 100 Pa	sets	2				
39.2	**Propeller Type Fans** These exhaust fans shall be automatic sutter on one side an security grille on other side to prevent accidents. Power : 415V / 3Ph / 50 Hz						
39.2.1	**EAF GF/01,02,03,04 (Exhaust Air)** Air flow rate: 5000 CFM	sets	4				
39.3	**Fans with Starter For Toilet exhaust** Type: Circular type with duct in line connection Air flow rate: 350 CFM; ESP: 100 Pa;	sets	16				
39.4	**Ceiling mounted Toilet Exhaust Fan with built-in Grille** It contains followings: -Fan body made of ABS Plastic -Round spigot opening for flexible connection -Non-return flaf to prevent back flow -Balanced turbine fan with curved blade -Capacitor operated motor with Class E insulation -Spring clip on front cover for easily removable -ESP: 50 pa -Power supply: 220V, 1 ph, 50 Hz, -Sound rating: Max 40 dBA at 3 m -Air flow rate: 50 CFM	sets	3				
40.0	**Closed Type Expansion Tank with Auto Refil Pump** The closed type Expansion Tank shall be complete with Automatic Refil Unit based on system pressure requirement (2 to 3 Bar, adjustable). It is constructed of mild steel. The tank shall be painted. Accessories: -Auto Refil pump (pressure actuated with Pr. Sensor) -Isolating valve -Check valve -Pressure relief Valve -Air Purger -Starter Panel -Capacity: 1500 Liter The outside surface of the tank shall be insulated with 38mm. Thick of fire retardant type closed cell insulation. The tank shall be installed on R.C.C colum after proper clipping of the roof. All the accessories of the tank shall be properly cleaned, painted over the primer. The outer surface of	set	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	the insulation shall be plastered with neat finish over G.I wire-mesh.						
41.0	**Pre-insulated Pipe Pipe: Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 grade C Heavy duty Insulation:** Poly Urethene, density: 45 kg.m3 minimum, Insulation Thermal conductivity: 0.022 w/mK at 20 C mean temp. **Jacketing:** 0.5mm GP Sheet, spiral wound The works shall be complete with factory fabricated bends, tees, elbows, reducers, socket, union, nipple, flange, etc. as per requirement, drawing and direction. Pipe work shall be complete with pipe hangers, supports, vibration isolator brackets, etc. .						
41.1	Dia 200 mm (thick 50mm)	m	150				
41.2	Dia 150 mm (thick 38mm)	m	50				
41.3	Dia 100 mm (thick 38mm)	m	100				
41.4	Dia 80 mm (thick 38mm)	m	50				
41.5	Dia 65 mm (thick 38mm)	m	100				
41.6	Dia 50 mm (thick 38mm)	m	200				
41.7	Dia 40 mm (thick 38mm)	m	250				
41.8	Dia 32 mm (thick 38mm)	m	150				
41.9	Dia 25 mm (thick 32mm)	m	350				
41.10	Dia 20 mm (thick 32mm)	m	450				
42.0	**Chilled Water Pipe Insulation (Joining between Preinsulated pipe or in case of shortage of imported items)** Chilled Water Pipe Insulation with Poly Urethene and Jacketing with GP Sheet of 26 SWG.						
42.1	Dia 200 mm (thick 50mm)	m	1				
42.2	Dia 150 mm (thick 38mm)	m	1				
42.3	Dia 100 mm (thick 38mm)	m	1				
42.4	Dia 80 mm (thick 38mm)	m	1				
42.5	Dia 65 mm (thick 38mm)	m	1				
42.6	Dia 50 mm (thick 38mm)	m	1				
42.7	Dia 40 mm (thick 38mm)	m	1				
42.8	Dia 32 mm (thick 38mm)	m	1				
42.9	Dia 25 mm (thick 32mm)	m	1				
42.10	Dia 20 mm (thick 32mm)	m	1				
43.0	**Duct Work (Pre-insulated)** Supply, fabrication and installation of galvanized sheet steel duct work complete with bends, Tees, reducers, branch takeoffs, air chamber etc. as per direction and drawing. Hangers,						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	brackets, stiffeners and isolator boxes shall be fabricated with M.S. angle/F.I. bar or rod as per drawing and direction and shall be galvanized. Duct shall be constructed with best-bloomed galvanized sheet steel. Before installation of duct, inside and outside shall be cleaned from any dust. Between flanges, for flanged end duct, approved type of gasket shall be used. Approved type of sealing compound shall be used to make the duct work leak-proof. Duct shall be hanged or supported at an interval of not more than 1.8 meter.						
43.1	**Duct made of 24 SWG sheet** Pre-insulated ducts up to 300 mm width shall be fabricated with 0.70 mm (24 BWG) thick sheet steel and drive S-slip joint shall be used and fixing of duct insulation of required thick glass wool with K value of not more than 0.027 Kcal/hr./sqm/0C/mm at 200C. Insulation shall be complete with reinforced aluminum foil vapor barrier, adhesive, aluminum tape, fixing pin @ 250 mm c/c.	sqm	2150				
43.2	**Duct made of 22 SWG sheet** Pre-insulated and pre-cleaned duct having larger size from 300 mm to 1050 mm width shall be fabricated with 0.85 mm (22 BWG) thick sheet steel and shall be provided with companion flanged joint reinforced with 25 x 25 x 3 mm M.S. angle and fixing of duct insulation of required thick glass wool with K value of not more than 0.027 Kcal / hr / sqm / 0C / mm at 20oC. Insulation shall be complete with reinforced aluminum foil vapor barrier, adhesive, aluminum tape, fixing pin @ 250 mm c/c.	sqm	700				
44.0	**Duct Acoustic Lining** Duct accoustic lining made of nitrile rubber base with open elastomeric foam, specially prepared for duct accoustic. Lining shall have peelable self adhesive tape for fixing with duct. -Operating temperature: -20 C to 85 C -Thermal Conductivity: Max 0.047 W/mK @ 20 C -Fire: Class 1 -Density: Min 140 kg/m3 -Tensile Strength: Minimum 100kPa -Thickness: 15mm	sqm	950				
45.0	**Air Terminals** Air terminals shall be constructed						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	with extruded aluminum with powder coating finishing. Thickness shall be not less than 18 SWG.						
45.1	**4-way Supply Air diffuser** c/w Opposed blade type neck damper. Dmaper shall have worm gear for operating from roomside.	sqm	34				
45.2	**Jet diffuser** Dia 250 mm dia	nos	12				
45.3	**Return Air Grille** (Egg Crate type)	sqm	25				
45.4	**Fresh Air Louver/ Exhaust Air Louver c/w G4 washable filter** - with neck Damper made of Aluminum	sqm	4				
46.0	**Duct Flexible Joint with FCU/Fan** Duct connected with Fan Coil Units, Air Handling Units, Fans, etc. shall be done with Nylex or equivalent Flexible connection. Width shall be maximum 150 mm. Duct must be in lined with corresponding equipment opening.	nos	27				
47.0	**Pipe Accessories Insulations** All Chilled water pipe accessories such as Valves, Strainers, shall have to be insulated with loose glass wool with adhesive cement. Two layers of 0.1 mm thick polythene sheet wrapping with 0.8mm dia copper wire, markin cloth and thereafter painted with synthetic enamel paint.	lot	1				
48.0	**Dampers**						
48.1	**Volume Control Dampers** Supply & installation of volume control damper constructed with 18 BWG sheet steel painted with 2 coats of synthetic black paint, adjustable locking arrangement from outside of duct and suitable to mount on flanged end duct as per drawings and direction of the Engineer (local made) .	sqm	4				
48.2	**Fire Damper** Fire Damper shall be constructed according to NFPA 90A. Free X-section area shall be at least 85% of face area. It shall be constructed with Pre-galvanized steel. All moving parts shall be constructed with Stainless steel to prevent seizure. Fire Damper should be with extended sleeve. Withstanding pressure: 2000 pa minimum. Fire rating: min 3 hour Neck Size: 450x300mm	No	8				
49.0	**Secondary Drain Pan** -Made of 0.6mm thick SS Sheet -Insulation: PU 25mm thick	sets	8				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	-Tray size: 800mm x 400mm x 40mm -Accessories: drain port with hose						
50.0	**Electrical Works**						
50.1	**Air Conditioning Distribution Board (ADDB)** Electrical power distribution board shall be constructed with steel sheet painted with epoxy paint and shall house MCCBs, MCBs, Busbars, Starters, Overload protector for motors, etc. All MCCBs, MCBs, shall be of brand DORMAN SMITH / SIEMENS /ABB/Schneider or equivalent. Front panel shall be with Voltmeter, Ampere meter, phase indicators, Start stop button, internal wiring, etc. Other details shall be as per drawing and corresponding technical Specifications. -kW rating mentioned in drawing are approximate. Bidders must have to consider components sizing based on kW rating of their selected equipment. -Incoming circuit breaker shall have tripping provision receiving signal from FACP. -Details shall be as per Schematic drawings						
50.1.1	ACDB for GF/01	set	1				
50.1.2	ACDB GF/02 for Chiller Plant Room	set	1				
50.1.3	ACDB for GF/03	set	1				
50.1.4	ACDB for GF/04	set	1				
50.1.5	ACDB for 1F/01	set	1				
50.1.6	ACDB for 2F/01	set	1				
50.1.7	ACDB for 3F/01	set	1				
50.2	**Electrical Cable Works**						
	PVC insulated PVC sheathed copper conductor single / multicore cable complete with PVC conduit, Tray / Ladder and copper conductor (ECC). Conduit works shall be complete with Bends, Tees, Junction box, etc. The others details shall be as per Technical Specifications and drawing. kW rating mentioned here are approximate. Bidders must have to consider cable sizing based on kW rating of their selected equipment.						
50.2.1	**For Chiller** NYY 3x1cx400 rm+ BYA 1cx240 sm ECC	rm	27				
50.2.2	**For Chilled Water Pumps** NYY 6x1cx10 rm+ BYA 1cx10 rm ECC	rm	60				
50.2.3	**For Fan Coil Units / Fans (Three Phase)**	rm	45				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	NYY 3x1c-2.5rm + BYA 1cx1.5 rm						
50.2.4	**For Fan Coil Units / Fans (single Phase)** NYY 2x1c-2.5rm + BYA 1cx1.5 rm	rm	1500				
50.2.5	**Control Cable** For Thermostat wiring including Conduit works	sets	140				
51.0	**External Duct/Pipe Jacketing** Jacketing shall be done with 24 SWG Aluminum sheet. Weather proof sealant to be used at all joining places.	m^2	50				
52.0	**Condensat drain piping** Made of PVC Water grade pipe with 15mm thick Aluminum Foil pasted PE Insulation. The pipe works includes Elbow, Tee, Reducer, Socket, Nipple, Endcap, Deadplug, Hanger, support, etc.						
52.1	Dia 20mm	m	700				
52.2	Dia 25mm	m	500				
52.3	Dia 32mm	m	350				
52.4	Dia 40mm	m	200				
52.5	Dia 50mm	m	150				
53.0	**Split type Air conditioners** Split Air conditioners shall be composed of one outdoor Condensing unit and one Indoor Fan Coil Unit. The Condensing unit shall be consisted of compressor(s), Air Cooled condenser, Condenser Fan, etc. The Indoor Fan Coil units are consisted of evaporator coils with fans, etc. These units shall be factory assembled, internally wired, fully refrigerant charged condensing unit, tested under strict quality standards. The Condensing unit shall be suitable for outdoor installation. Capacity be as per following schedule. The cost includes Refrigerant piping between outdoor unit to Indoor units, drain piping, Power cabling from ACDB and control Cabling between Room Thermostat & Indoor units. -Entering air temp to FCU: 25 C DB / 18 C WB -Entering air temp to Condenser: 36 C DB / 27.5 C WB -Accessories: Wall mounted Room Thermostat						
53.1	**With Wall mounted Decorative Fan Coil Unit, OU GF/01** Cooling capacity: 2 TR Evaporator / FCU Air Flow rate: 600 M3/hr Minimum	set	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
54.0	**Shop drawing and Documentation** Preparation of detail Shop drawing including, layout drawing, section details, schematic drawing, etc. Get approval of shop drawing before any fabrication or installation works. Shop drawing must be coordinated with other services likely Electrical cabling, Light Fixtures, False Ceiling and Interior design. The work also includes: a). Show actual dimension & weight of Equipment. b). Show actual kW, LRA, RLA, No of Phase, Circuit Breaker ratings, etc. rating of all equipment. c). Reconfirm Electrical cable sizing. d). Reconfirm Ampere ratings of AC Panels components. e).Submit Electrical connection diagram of AC Panels. f). Submit General arrangement of AC Panels. g). Submit Plinth drawing for all equipments supports with operating weight. h). show union, socket,nipple, reducer, end plug, dead cocks, etc. in piping drawings. i). Submit Electrical and P&I Diagram of Chilling unit. j). Show input requirement from Client in red colour. k). Bottom level for all duct, pipe, Equipment, Cable Tray, etc. from Finished Floor Level. l). Submit advance copy of Installation, Operation and maintenance manuals of all equipment. Contractor should prepare this drawing at site coordinating with other services. Drawing submission in suitable paper size with minimum 1:50 scale. Soft copy AutoCAD to be furnished with hard copy. In case of any conflict between Design drawing and Shop drawing, information in the Design drawing will predominate unless recommended by the Consultant.	job	1				
55.0	**Tagging and Identification** Tagging and identification of equipments, Pipings, Cablings, etc. as per recommendation of the Consultant.	job	1				
56.0	**As-Built drawing** Preparation and submission of As-built drawing in following forms: One set in tracing paper, size A1 Two sets print out in A1 Paper Soft Copy in CD in AutoCAD Version 2020 Soft Copy in PDF Version	job	1				
57.0	**Testing, Commissioning and**	job	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	Balancing After proper installation and certification the system shall be tested, commissioned and balanced as per direction and recommendation by the Manufacturer as well as HVAC Designer. Contractor shall do (but not limited to) following works under this clause. - Prepare and submit Commissioning protocol and get approval from Consultant. - Carry out duct inspection for FCUs and Fans - Carry out pipe pressure testing and inspection - Carry our Electrical Cabling testing and inspection - Pipe flushing and charging of Treated Water - Chemical cleaning of rust, etc. - Testing of condensate water drainage slope with water - Testing of FCUs, Fans with Air and Water Balancing. - Testing and Balancing of Pumps with Chilled water - Cleaning of Y Strainers - Commissioning of Chillers, VRF, etc. - Safety protection and cutouts shall be tested individually - Commissioning of Automatic Control system - Balancing of Air flow rate, Temperature - Functioning test of Multi Chiller Control, Compressor sequencing and Pump control system All testing and commissioning works must be documented in approved formats. All of these documents must be jointly witnessed and signed by the Client and Contractors authorized Engineer.						
58.0	**Documentation** Compiling Documents with followings Name plate data of all equipments Recommended list of Spare parts. Submission of Operational and Maintenance manual for Chillers, Pumps, etc. Submission of Control schematic drawing, operation procedure and maintenance - trouble shooting manuals for Automatic Control systems. Compiling of certified Testing and Commissioning Documents. Compiling of certified As-built drawings. Preparation of	job	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	periodic servicing and maintenance schedule. etc.						
59.0	**Operation and maintenance (8 hr/day basis)** Thorough maintenance, servicing, operation and minor repairing including necessary replacement of defective minor spare parts (departmentally supplied) if any, as per detailed daily, weekly, monthly, half yearly and yearly as per following work schedule for smooth functioning of the following capacity air-conditioning & ventilation system as per standard Engineer practice and maintenance manual of the manufacturer and direction of the Engineer. Log book for one hourly record shall be maintained by the Contractor and shall be submitted to the Owner in every week**.**	months	3				
60.0	**FIRE PUMP :** Pump for fire fighting system shall be complete with mounting, coupled drive, controller etc. Pump shall be operated on pressure signal from pressure switch with all controls and accessories as per pump detail drawing. The works includes cabling from Pump controllers to Pumps, control cabling, Pressure transmission piping, etc. Bidder must submit Software selection for all Pumps complying Water flow rate and head.						
60.1	**Diesel Engine Driven Fire Pump (FP 01)** Engine driven fire pump shall be complete with direct coupled 4 stroke diesel engine, pump, all controls and accessories, diesel tank etc. as per specification and drawing. Pump type: Turbine type Water Flow rate: 1000 US GPM, Pump Head: 9 BAR Pump Efficiency: minimum 60%, Pump RPM: 2900 Pump casing: Cast Iron, Test pressure: Min 18 Bar Pump Impeller: Bronze, Pump shaft: Alloy steel Pump water seal: Gland packing, Pump set shall have following accessories: Engine Capacity: 20% over then break horse power Engine over speed shutdown device Engine Tachometer: Engine oil pressure gauge	Set	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	Engine Battery & Charger Engine Aspiration: Turbo charged, Fuel Connection, Fire resistance Flexible Supply & Return, Fuel Tank with fuel system and direct reading fuel gauge, 5-8 Stages impeller Automatic air release valve: - 90mm dia Suction gauge range 30"-0-150 psi - 90mm dia Discharge gauge range 0-300 psi - Float - operated air release valve - Flexible coupling - Coupling guard - Pressure relief valve with enclosed Waste cone - Concentric reducer All accessories of pressure sensing line Other accessories shall be NFPA 20 compliant Work also includes: Chimney for Diesel Engine Pump Controller Exhaust ducting, louver, insect proof netting **Listed: UL/ULC/EN/VDS/JIS**						
60.2	**Electric Motor Driven Fire Pump (FP 01)** Electrical driven fire pump shall be complete with motor, starter, base plate, coupling, all other accessories etc. as per specification and drawing. Pump type: Turbine type Water Flow rate: 1000 US GPM, Pump Head: 9 BAR Pump Efficiency: min 60%, Service Factor for Motor: 1.20 Pump RPM: 2900 Pump casing: Cast Iron, Test pressure: Min 18 Bar Pump Impeller: Bronze, Pump shaft: Alloy steel Pump water seal: Gland packing, Pump set shall have following accessories: Suction & Discharge gauge, 5-8 Stages impeller Automatic air release valve: - 90mm dia Suction gauge range 30"-0-150 psi - 90mm dia Discharge gauge range 0-300 psi - Float - operated air release valve - Flexible coupling - Coupling guard - Pressure relief valve with Waste cone - Concentric reducer All accessories of pressure sensing line Pump Controller Other accessories shall be NFPA 20 compliant **Listed: UL/ULC/EN/VDS/JIS**	Set	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
60.3	**Jockey Pump (JP 01)** Jockey pump shall vertical type complete with pump, pump motor, pressure switches all other standard accessories as per specification. Water Flow rate: 50 US GPM, Pump Head: 9.5 BAR Type : Multi-stage vertical turbine, Efficiency: 60% minimum, Supply: 380V/50Hz/3Ph voltage supply, Motor: RPM TEFC sq.cage, Service factor 1.2, NFPA-20 compliant. - with Fitting: 20mm Casing relief valve - with gauges for suction and discharge **Pump Controller shall be UL/ULC/EN/VDS Listed**	Set	1				
61.0	**VALVES & FITTINGS GATE VALVE :** Valve & fittings complies with ANSI, flange / groove type, temperature range: 0°C-80°C; working pressure: 200 PSI minimum, valve body as per ASTM A536, 65-12 standard, UL / FM approved. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.						
61.1	**O. S & Y GATE VALVE**						
	a) 150mm dia (2 Nos valve with supervisory switch)	Nos.	7				
	b) 50mm dia	No.	1				
61.2	**RESILIENT SWING CHECK VALVE**						
	a) 150mm dia	Nos.	2				
	b) 50mm dia	No.	1				
61.3	**FOOT VALVE WITH STRAINER**						
	50 mm dia.	No	1				
61.4	**FLEXIBLE JOINT :** Supply & installation of flexible joint complies with ANSI, temperature range: 00C-800C; working pressure: 200 PSI minimum, valve body as per ASTM A536, 65-45-12 standard, UL / FM approved.						
	a) 150mm dia	Nos.	2				
	b) 50mm dia **Listed: UL/ULC/EN/VDS/JIS**	No.	1				
61.5	**BALL VALVE class: PN20, UL / FM approved**						
61.5.1	a) 25mm dia	Nos.	8				
61.5.2	b) 20mm dia	Nos.	2				
61.6	**PRESSURE GAUGE: UL listed / FM approved** Supply and installation of 3.5'' - 4" dial type pressure gauges including supply of all accessories and	Nos.	2				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	consumable. The range shall be 0-250 psi. UL/FM approved. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.						
61.7	**AUTO AIR-VENT VALVE:** Auto air vent valve of 1 inch dia of 1 inch (25mm) inlet BSP, bronze made with rubber ball & seat. The valve shall be suitable to release air from the fire hydrant pipes. Shall be suitable to withstanding pressure up to 10kg/cm2. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.	Nos.	2				
61.8	**WATER FLOW METER:** 150mm dia **Listed: UL/ULC/EN/VDS/JIS**	No.	1				
62.0	**SPRINKLER HEAD :** Sprinkler head of 1/2" in diameter nominal orifice, K-Factor 5.6 chrome finish glass bulb type. Temperature rating 680 C for general area others area shall be specified as per requirement. Sprinkler head shall be UL Listed / FM Approved Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.						
62.1	Pendent sprinkler	Nos.	403				
62.2	Up-right sprinkler	Nos.	5				
63.0	**SPRINKLER ALARM CHECK VALVE** The valve shall be actuated breaking of sprinkler glass bulb. The valve shall be UL listed / FM approved. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally. dia 150mm	No.	1				
64.0	**ZONE CONTROLN VALVE:** Zone control valve to get the notification of water flow from any fire zone on a combination of butterfly valve with tamper switch, flow switch, pressure gauge and test & drain valve. UL listed / FM approved. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.						
64.1	dia 100 mm	Nos.	4				
64.2	dia 80 mm	No.	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
64.3	dia 65 mm	No.	1				
64.4	**SIGHT GLASS:** For dia 25mm	Nos.	5				
65.0	**FIRE BRIGADE CONNECTION:** Fire brigade connection: 4- way Supply and installation of 4 - way fire brigade connection complete in all respect with all accessories. The unit shall have two Inlet connections of 2½" (63mm) male instantaneous with non-return valve and having 6" dia. (150mm) flanged type outlet directly connected with stand pipe. It will have also one 25mm dia. drain valve for drainage of water, rubber blank cap and chain for protection. Outlet 150mm dia. shall be as per ANSI-B-16B-16.5B. Shall be suitable to withstand pressure of 20kg/cm^2. Shall be manufactured according to BS standard & suitable for using with fire service & civil defense department of BANGLADESH. Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.	No.	1				
66.0	**FIRE HYDRANT UNIT (40mm dia):** Each 1½" (40mm) dia Fire Hydrant Unit shall be complete with the following Components and accessories.						
66.1	**Hose Angle Valve (Landing valve): 40mm dia** Hose Angle valve / Landing valve of 1½" (40mm) shall be made with brass / bronze with instantaneous female outlet. The valve shall be UL Listed /FM approved and working pressure shall not be less than 10kg/cm^2. Inlet shall be threaded end type, shall be installed inside the hydrant cabinet. Country of origin: USA / European countries / SOUTH KOREA / MALAYSIA / TAIWAN or their licensed manufacturing units located globally.	Nos.	12				
66.2	**Fire Hose : 40mm dia** Fire Hose of 40mm dia 30 meter long suitable to install inside the Hydrant cabinet. The hose shall confirming to BS 6391 . The Hose shall be UL Listed /FM approved & Burst Pressure shall be not less that 600 psi and working pressure 200 psi, shall be made with special quality EPDM rubber as internal lining, suitable to withstand heat and	Nos.	12				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	polluted water, heat and abrasion resistance, Jacketing shall be made up of 100% polyester for extra strength. Hose shall be 30meter long in a single length and shall be with male coupling in one end other end with female coupling. Couplings shall be banded with hose with copper wire properly. Instantaneous couplings shall be made with bronze / aluminium alloy, polished / hard anodized to confirm BS 336. Country of origin: USA / European countries / SOUTH KOREA / MALAYSIA / TAIWAN or their licensed manufacturing units located globally.						
66.3	**Jet / Spray Nozzle : 40mm dia** Jet / Spray Nozzle having 40mm dia male instantaneous coupling. The Nozzle shall be operable in three modes: Jet - Spray - Shut off. The Nozzle shall be light weight and easy operable. Construction of the Nozzle shall be of Brass or Alluminium & Nylon. Working pressure shall be not less than 7Kg / Cm^2. Flow shall be not less than 100 lpm @ 7kg / cm^2. Nozzle shall be install inside the cabinet. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.	Nos.	12				
67.0	**FIRE HYDRANT UNIT (65mm dia):** Each 65mm dia Fire Hydrant Unit shall be complete with the following Components and accessories.						
67.1	**Hose Angle Valve (Landing valve): 65mm dia** Hose Angle valve / Landing valve of 65mm shall be made with brass / bronze with instantaneous female outlet. The valve shall be UL Listed /FM Approved and working pressure shall not be less than 10kg/cm^2. Inlet shall be threaded end type, shall be installed inside the hydrant cabinet. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.	Nos.	12				
68.0	**PILLAR HYDRANT :** Pillar Hydrant : Double Headed Cast Iron body Double Headed Pillar Hydrant complete with Two (02) nos. cast brass made controllable outlet of	Nos.	4				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	65mm dia with female instantaneous outlet, Inlet shall be 100mm dia flanged end. The Hydrant shall be suitable to withstand test pressure of 300 psi (min). Color of the unit shall be red / approved by the manufacturer or as per code. Pillar hydrant shall be BS standard. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.						
69.0	**STEEL CABINET:** Hydrant cabinet of suitable size (as per site measurement and requirement / Recommendation of Engineering in Charge) to accommodate Landing valve, Hose, Nozzle and coupling. The cabinet shall be with swing type door with breakable tempered glass. The Cabinet shall be made with 16 SWG sheet steel, Powder coated of red color. Country of origin: Locally fabricated						
69.1	Class- III cabinet (for 65mm dia hose rack assembly)	Nos.	12				
69.2	Outdoor hydrant box for pillar hydrant	Nos.	4				
70.0	**BLACK STEEL PIPE ERW, 40 SCHEDULE:** Black steel pipe ASTM A53 ERW, 40 schedule. The pipe work shall be include with welded type tee, elbow, reducer etc. and also hangers / supports etc. completed. Pipe work (over ground) shall be painted with red oxide primer. Underground pipe should be laid after wrapping with PVC tape after using approved prior. pipe wall thickness shall be as per mention for different diameters. Country of origin: AUSTRALIA / CHINA / INDIA. / JAPAN / SOUTH KOREA / VIETNAM.						
70.1	200mm (8 inch) dia. Wall thickness: 8.2mm	RM	0				
70.2	150mm (6 inch) dia. Wall thickness: 7.1mm	RM	220				
70.3	100mm (4 inch) dia. Wall thickness: 6.0mm	RM	45				
70.4	80mm (3 inch) dia. Wall thickness: 5.5mm	RM	65				
70.5	65mm (2½ inch) dia. Wall thickness: 5.2mm	RM	200				
70.6	50mm (2 inch) dia. Wall thickness: 3.9mm	RM	176				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
70.7	40mm (1½ inch) dia. Wall thickness: 3.7mm	RM	299				
70.8	32mm (1.25 inch) dia. Wall thickness: 3.6mm	RM	225				
70.9	25mm (1 inch) dia. Wall thickness: 3.4mm	RM	950				
70.10	20mm (3/4 inch) dia. Wall thickness: 2.9mm	RM	15				
70.11	12mm (1/2 inch) dia. Wall thickness: 2.8mm	RM	15				
71.0	**FIRE RATED DOOR:** Fire Door Minimum 2 hours fire rated & controlled by Fire alarm control panel, Fire door size shall be as per Architectural drawing. The Fire Door shall have following features: Leaf Configurations: As per Architectural drawing Door & panel: minimum 48mm thick Door frame: Pressed metal Door metal: Steel Visions panel for fire door using clear rated glass Kick panels of stainless steel to selected height Door C/W Smoke seals, viewing lens, electric strike & locks, panic bars, Magnetic Door Holder, magnetic hold open devices. **Listed: UL/ULC/EN/VDS/JIS**	Nos.	4				
72.0	**FIRE EXTINGUISHER**						
72.1	**Dry chemical powder type:** Supply & fixing the following capacities multi purpose ABC dry chemical powder stored pressure type with manometer system fire Extinguisher suitable for repeated use complete with wall bracket, CO2 Cartridge, easy refilling system etc. as per sample accepted/approved by the Engineer. Monoamonium phosphate based 40% ABC dry chemical agent & has moisture- proof, anti- caking properties. working pressure: 12 BAR minimum. proper fire rating (as per NFPA 10) according to the capacity of the extinguisher. Manufacturer certificate shall have to be submitted if needed. Also sample of the dry chemical power will be tested by the proper authority in BANGLADESH if needed. Country of origin : CHINA / MALAYSIA or equivalent						
72.1.1	6 Kg. capacity.	Nos.	35				
72.2	**Carbon- Di- Oxide type:** Supply & fixing the following						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	capacities Carbon-di-Oxide type fire extinguisher suitable for repeated use complete with wall bracket, discharge nozzle etc. As per sample accepted/approved by the Engineer. Country of origin: CHINA / MALAYSIA or equivalent product.						
	5 Kg. capacity	Nos.	11				
72.3	**Automatic Modular type Ceiling mounted Fire Extinguisher (Clean Agent)** The Clean agent extinguishing concentration for normal Class A combustibles is approximately 5.8 - 7% by volume. The minimum design concentration for total flood. Applications should be in accordance with NFPA 2001. Modular cylinders furnished with ceiling mounting brackets are of carbon steel. Material ,factory argon/CO2 weld, sand blasted, white finished, oven baked and coated with electrostatic powder. The extinguisher complete with, clean agent gas, cylinder, nozzle etc Temperature rating 68 degree centigrade Agent weight 6 kg **Listed: UL/ULC/EN/VDS/JIS/LPCB**	Nos.	16				
72.4	**Automatic Modular type Ceiling mounted Fire Extinguisher (Foam Type)** Automatic Foam Extinguisher (AFFF- Aqueous Film Forming Foam) works by firstly applying a fila forming foam (bubbles) to the fire which causes a blanket over the fire, suffocating the fire, while almost simultaneously cooling the fire Capacity- 6 Liter Total Weight- 10.56 Kg Cylinder Height- 162mm Cylinder Diameter- 280mm Duration of Discharge- 25 to 30 Second Extinguisher Agent- AFFF Propelling Agent- N2 Working Pressure- 12 to 15 Bar Testing Pressure- 30 Bar Storage Temperature- 5°C to 60°C	Nos.	6				
72.5	**Wet Chemical Type Fire Extinguisher** The 'chemical' element of wet chemical fire extinguishers is potassium. Potassium salts are sprayed out as a fine mist (gently, so as not to spread the burning oil or fat), and these react to create a soapy film on the surface of the substance on fire. Fire Extinguisher suitable for	Nos.	2				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	repeated use complete wall bracket, discharge valve, hose pipe, easy refilling system etc. as per sample approved by the Engineer-in -charge. Capacity 6 kg						
73.0	**ELECTRICAL WORKS**						
73.1	**Fire System Distribution Board (FSDB)** Providing & fixing 415V/250V, 50 Hz grade following concealed or surface type Distribution Board (DB)/Sub Distribution Board (SDB) made of 18-SWG MS sheet complete with hinged type door, built-in type locking arrangement, following capacity bus-bar with required no. of holes thereon on insulators at both ends, copper blocks for neutral and earth terminal, SP MCBs / TP MCBs/ TP MCCBs manufactured and tested in accordance with relevant IEC/VDE/NEMA/BS/JIS standard having following breaking capacity with thermal over current and instantaneous electromagnetic short ckt. release, necessary arrangement for fixing of above CBs including stove enamel/gray hammer painting of board etc **Incoming** 250 Amps TP MCCB (36 kA) with following accessories: **Busbars** 300 amps TPN +E, copper busbars with color coded heat shrinkable insulation sleeve. **Outgoings** 1 No. 250A, TP MCCB (36 kA) 1 No.16A, TP MCB (6 kA) 1 No. 20A, SP MCB (6 kA) 1 No. 16A, SP MCB (6 kA) 1 No.16A, TP MCB (6 kA) Spare	Set	1				
73.2	**Electrical Cabling (through PVC conduit), Fire Rated** Surface conduit wiring with the following PVC insulated and sheathed stranded cable (NYY) / XLPE insulated and PVC sheathed stranded cable (2XY) & PVC insulated Green / White colour ECC wire (BYA) through PVC conduit of reputed manufacturer complete with fixing materials, other accessories etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	standards.						
73.2.1	**FSDB to Pumps Controller FSDB to Pumps Controller (Electric Pump)** 1C-4x95sqmm (NYY) with 50 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 75 mm having wall thickness of 3 mm	RM	10				
73.2.2	**FSDB to Pumps Controller (Jockey Pump)** 1C-4x4 sqmm (NYY) (FR) with 4 sqmm (BYA) (FR) ECC wire through PVC pipe of minimum inner dia. 30 mm having wall thickness of 1.5 mm	RM	10				
73.2.3	**FSDB to Pumps Controller (For Diesel Pump)** 1C-2x4 sqmm (FR) cable with 4 sqmm (FR) ECC wire through PVC pipe of minimum inner dia. 25 mm having wall thickness of 1.5 mm	RM	20				
74.0	**SHOP DRAWING:** Preparation of detail Shop drawing including, layout drawing, section details, schematic drawing, etc coordinating with different installations of existing factory. Get approval of shop drawing before any fabrication or installation works. The work also includes: a) Show actual dimension of Equipment b) Submit actual kW rating of all equipment c) Reconfirm Electrical cable sizing d) Reconfirm Ampere ratings of electric components e) Submit Electrical conn diagram of Electric Panels f) Submit General arrangement of Electric Panels g) Submit Plinth drawing for equipment and Pipe supports	Job	1				
75.0	**AS-BUILT DRAWING** Preparation and submission of As-built drawing in following forms: One set in tracing paper, size A1 Two sets print out in A1 Paper Soft Copy in CD in AutoCAD Version 2010 Soft Copy in PDF Version	Job	1				
76.0	**TAGGING, IDENTIFICATION & SIGNAGED INDICATION:** As per NFPA Code	Job	1				
77.0	**TESTING, COMMISSIONING AND BALANCING** The system shall be tested, commissioned and balanced as per direction and recommendation. Pipe work shall be tested at a test pressure of 15 kg/cm^2 for 24 hours without any	Job	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	leak. After proper testing, commissioning and balancing the system shall run for seven days up to the satisfaction of the Owner. Submit advance copy of Installation, Operation and maintenance manuals. The work includes training to the Owner's representative at site						
78.0	**IRE ALARM CONTROL PANEL:** Addressable type Fire Alarm Control Panel complete with following basic options. Master Controller Assembly / CPU shall be suitable with port to add Voice alarm system / Fire Fighter Telephone system / Printer / Remote Annunciator etc. FACP must be comply with internationally accepted standard. Control units for Fire - Protective Signaling Systems" Addressable Fire Alarm Control Panel shall be complete, non-coded, Addressable, microprocessor based with initiating devices, notification appliances, and monitoring and control devices. Annunciation: Operation of alarm and supervisory initiating devices shall be annunciated at the FACP indicating the location and type of device. Monitoring: FACP shall individually monitor sensors for calibration, sensitivity, and alarm condition, and shall individually adjust for sensitivity. The control unit shall determine the condition of each sensor by comparing the sensor value to the stored values. Environmental Compensation: The FACP shall maintain a moving average of the sensor's smoke chamber value to automatically compensate for dust, dirt, and other conditions that could affect detection operations. Programmable Sensitivity : Photoelectric Smoke Sensors shall have various sensitivity levels ranging from (±) 0.2% up to 3.7%, programmed and monitored from the FACP. Sensitivity Testing Reports: The FACP shall provide sensor reports that meet NFPA /internationally accepted standard calibrated test method requirements. The reports shall be viewed on a CRT Display or printed for annual recording and logging of the calibration maintenance schedule. The FACP shall automatically indicate when an individual sensor needs cleaning. The	Set	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	system shall provide a means to indicate that a sensor requires cleaning. When a sensor's average value reaches a predetermined value, (3) progressive levels of reporting are provided. The first level shall indicate that a sensor is close to a trouble reporting condition and will be indicated on the FACP as "ALMOST DIRTY." This condition provides a means to alert maintenance staff of a dirty sensor without creating a trouble in the system. If this indicator is ignored, a second level "DIRTY SENSOR" condition shall be indicated at the FACP and subsequently a system trouble is reported [to the Central Monitoring Station]. The sensor base LED shall glow steady giving a visible indication at the sensor location. The "DIRTY SENSOR" condition shall not affect the sensitivity level required to alarm the sensor. If a "DIRTY SENSOR" is left unattended, and its average value increases to a third predetermined value, an "EXCESSIVELY DIRTY SENSOR" trouble condition shall be indicated at the control unit. The FACP shall continuously perform an automatic self-test on each sensor which will check sensor electronics and ensure the accuracy of the values being transmitted. Any sensor that fails this test shall indicate a "SELF TEST ABNORMAL" trouble condition. Options at FACP : The control panel operator shall be able to make announcements via the push-to-talk paging microphone over the pre-selected speakers. Soft touch keypad, LED indications, LCD Display. Facility for total building paging shall be accomplished by the means of an "All Call" switch. Firefighter's phone (Optional) : Provide a supervised, two-way communication system between the Command Center/main fire alarm control panel and emergency phones. The firefighter's phone system shall be capable of handling single or simultaneous conversations with all phones connected into the system. As many as seven (7) phones shall be able to be connected into the active conversation. The phone system circuits shall be designed to prevent						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	static, hum or other interference for clear, intelligible two-way conversation among all phones of the system. The phone system circuits shall be supervised, such that the FACP shall be able to differentiate between whether a handset has been plugged into the emergency phone jack or whether the circuit has a shorted wire. A beeping busy signal shall indicate to the person attempting to use a remote phone that the signal is being received at the control unit and that the lines are intact.The act of plugging a handset into an emergency phone jack or removal of any phone from its normal hook position shall cause an audible and visual indication at the control unit. Picking up the master phone and acknowledgment of the phone circuit shall silence the tone and allow for direct two-way communications.The act of unplugging handsets in use and replacement of remote phones will return the phone circuits to their normal supervisory functions.The FACP shall be provided with sufficient battery capacity to operate the entire system upon loss of normal AC power in a normal supervisory mode for a period of 24 hours with 5 minutes of alarm operation at the end of this period. The system shall automatically transfer to battery standby upon power failure. All battery charging and recharging operations shall be automatic.Battery: Sealed lead-acid. Provide sufficient capacity to operate the complete alarm system in normal or supervisory (non-alarm) mode for a period of 24 hours. Following this period of operation on battery power, the battery shall have sufficient capacity to operate all components of the system, including all alarm indicating devices in alarm or supervisory mode for a period of 5 minutes. Power Supply (Input Power) shall be 240VAC. All circuits requiring system-operating power shall be 24 VDC and shall be individually fused at the control unit.The incoming power to the system shall be supervised so that any power failure will be indicated at the control unit. A green "power on" LED shall be displayed continuously while						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	incoming power is present.The system batteries shall be supervised so that a low battery or depleted battery condition or disconnection of the battery shall be indicated at the control unit and displayed for the specific fault type. The system shall support 100% of addressable devices in alarm or operated at the same time, under both primary(AC) and secondary (battery) power conditions.Loss of primary power shall sound a trouble signal at the FACP. FACP shall indicate when the system is operating on an alternate power supply.Product data sheets for system components highlighted to indicate the specific products, features, or functions required to meet this specification. Alternate or as-equal products submitted under this contract must provide a detailed line-by-line comparison of how the submitted product meets, exceeds, or does not comply with this specification.Wiring diagrams, Shop drawings showing system details including location of FACP, all devices, circuiting and details of graphic annunciator.System Power and battery charts with performance graphs and voltage drop calculations to assure that the system will operate per the prescribed backup time periods and under all voltage conditions per UL and NFPA standards.System operation description including method of operation and supervision of each type of circuit and sequence of operations for all manually and automatically initiated system inputs and outputs. A list of all input and output points in the system shall be provided with a label indicating location or use of IDC, NAC, relay, sensor, and auxiliary control circuits. Alphanumeric Display and System Controls: Panel shall be included an 80 character LCD display to indicate alarm, supervisory, and component status messages and shall include a keypad for use in entering and executing control commands. Voice Alarm: Provide an emergency communication system, integral with the FACP, including voice alarm system components, microphones,						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	amplifiers, and tone generators. Features include: Amplifiers comply with UL 1711, "Amplifiers for Fire Protective Signaling Systems." Amplifiers shall provide an onboard local mode temporal coded horn tone as a default backup tone. Test switches on the amplifier shall be provided to test and observe amplifier backup switchover. Each amplifier shall communicate to the host panel amplifier and NAC circuit voltage and current levels for display on the user interface.All announcements shall made over dedicated, supervised communication lines. All risers shall support [Class A][Class B] wiring for each audio channel.Emergency voice communication audio controller module shall provide up to 30 minutes of message memory for digitally stored messages. Provide supervised connections for master microphone and up to 5 remote microphones.Fire fighters' telephone communication system: Arrange system to use dedicated, two-way, supervised voice communication links between the FACP and remote fire fighters' telephone stations throughout the building.Fire Alarm Control Unit shall be capable of operating remote CRT's and/or printers; output shall be ASCII from an RS connection with an adjustable baud rate.Fire Alarm Control Unit shall be capable of operating a PC Annunciator which provides status annunciation and limited system control using a convenient and familiar Microsoft Windows® 2000 operating system based interface. PC Annunciator shall provide the following functions:FACP shall be with Login / Logout password protection with time duration selectable automatic logout. Displays: Alarm, Supervisory, Priority 2, and Trouble conditions with numerical tallies for each displays first and last alarms. Different event types have separate visible indicators with common audible indicator. Event logs can be searched and printed. View and / or print status reports and service reports (printing requires and available local or network printer).Alarm Silence, System Reset						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	and priority to reset global and individual point acknowledge. Set system time and date and clear event log, individual point access for control or parameter revisions.Each RS port shall be capable of supporting and supervising a remote Printer; the FACP shall support as many as remote displays. The Fire Alarm Control Panel shall support five RS ports.Cabinet shall be Lockable steel enclosure. Arrange unit so all operations required for testing or for normal care and maintenance of the system are performed from the front of the enclosure. If more than a single unit is required to form a complete control unit, provide exactly matching modular unit enclosures. Operation and maintenance data for inclusion in Operating and Maintenance Manual. Include data for each type product, including all features and operating sequences, both automatic and manual. Provide the names, addresses, and telephone numbers of service organizations.Operating Temperature Range: 32° to 120°F(0°to 49°C) Operating Humidity Range: Up to 93% RH, non-condensing @ 90° F (32° C) maximum Approvals: UL Listed / FM approved **FACP 251-500 Devices (Maximum)**						
79.0	**REPEATER PANEL / REMORT ANNUNCIATOR:** Repeater Panel / Remote LCD Annunciator with the same "look and feel" as the FACP operator interface. The Remote LCD Annunciator shall use the same Primary Acknowledge, Silence, and Reset Keys, Status LEDs and LCD Display as the FACP. Annunciator shall have super-twist LCD display with two lines of 40 characters each. Annunciator shall be provided with programmable control switches and associated LEDs. Under normal conditions the LCD shall display a "SYSTEM IS NORMAL" message and the current time and date. Should an abnormal condition be detected the appropriate LED (Alarm, Supervisory or Trouble) shall flash. The unit audible signal shall pulse for alarm conditions and sound steady for trouble and supervisory conditions. The LCD shall display the following	Set	1				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	information relative to the abnormal condition of a point in the system: 40 character location label. Type of device (e.g. smoke / pull station / water flow etc.). Point status (e.g. alarm / trouble). Operator keys shall be key switch enabled to prevent unauthorized use. The key shall only be removable in the disabled position. Acknowledge, Silence and Reset operation shall be the same as the FACP. Voltage: 20 to 32 VDC, system supplied Operating temperature range shall be : 0° to 40°C Operating Humidity Range: 10% to 90% from 0°to 40°C The Panel shall be fixed on wall with Surface mount box Approvals: UL, ULC Listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.						
80.0	**Digital PABX System**						
	6+8 Line Supply installation testing & commissioning of 6+8 line (extension capacity 24 lines) digital PABX system. Basic unit: 6+8 line PABX system Hardware: (CPU card, TNT card, power supply unit, & casing) Software: System operating software & billing software. Features: Direct inward station access including necessary, AUTO / DISA (voice), CID (caller ID), card co-line card, etc. built in billing system automatic fax / phone switching key telephone interface day / night service, total call report by extension, individual call report by extension, total call report by CO, individual call. Suitable for use in tropical country like BANGLADESH complete with required accessories and in conformity to specified codes & specification of international standards & CE / UL / CSA certified. Model & sample to be approved by the Engineer	Set	1				
81.0	**ADDRESSABLE TYPE PHOTOELECTRIC SMOKE DETECTOR** Addressable type Photoelectric Smoke Detector c/w Standard Base. Comply with internationally accepted standard "Smoke Detectors for Fire Protective Signaling Systems." Include the following features:The detector	Nos.	220				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	shall be Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore normal operation.Sensors shall be with Plug-In Arrangement and associated electronic components are mounted in a module that connects to a fixed base with a twist-locking plug connection. Base shall provide break-off plastic tab that can be removed to engage the head/base locking mechanism. No special tools shall be required to remove head once it has been locked. Removal of the detector head shall interrupt the supervisory circuit of the fire alarm detection loop and cause a trouble signal at the control unit.Sensors shall be with Quick Connect Arrangement: Photoelectric sensor and electronics in a single piece construction which shall twist-lock onto a mounting base that attaches to a standard electrical box.Each sensor base shall contain an LED that will flash each time it is scanned by the Control Unit (once every 4 seconds). In alarm condition, the sensor base LED shall be on steady. Each sensor base shall contain a magnetically actuated test switch to provide for easy alarm testing at the sensor location. Each sensor shall be scanned by the Control Unit for its type identification to prevent inadvertent substitution of another sensor type. Upon detection of a "wrong device", the control unit shall operate with the installed device at the default alarm settings for that sensor; 2.5% obscuration for photoelectric sensor, 135-deg F and 15-deg F rate-of-rise for the heat sensor, but shall indicate a "Wrong Device" trouble condition.The sensor's electronics shall be immune from false alarms caused by EMI and RFI.Sensors shall be including a communication transmitter and receiver in the mounting base having a unique identification and capability for status reporting to the FACP. Sensor address shall be located in base to eliminate false addressing when replacing sensors. Removal of the sensor head for cleaning shall not require the setting of addresses. UL Listed temperature Range shall be: 0° to 38°C and Operating temperature						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	range shall be : 0° to 50°C Housing color shall be Frost White. Smoke sensor Ambient Ratings: Air Velocity = 0-2000 ft/min (0-610m/min) Approvals: UL Listed/, FM approved/ LPCB approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally**.**						
82.0	**ADDRESSABLE TYPE HEAT DETECTOR** Addressable type Heat Detector / Thermal Sensor: Combination fixed-temperature and rate-of-rise unit with plug-in base and alarm indication lamp; 135° F fixed-temperature setting except as indicated. Thermal sensor shall be of the epoxy encapsulated electronic design. It shall be thermistor-based, rate-compensated, self-restoring and shall not be affected by thermal lag. The Heat Sensors of fixed temperature sensing shall be independent of rate-of-rise sensing and programmable to operate at 135° F or 155° F. Sensor rate-of-rise temperature detection shall be selectable at the FACP for either 15° F or 20° F per minute. The Heat Sensors shall have the capability to be programmed as a utility monitoring device to monitor for temperature extremes in the range from 32-deg F to 155-deg F. Addressable type Heat Detector / Thermal Sensor: Combination fixed-temperature and rate-of-rise unit with plug-in base and alarm indication lamp; 135° F fixed-temperature setting except as indicated. UL Listed temperature Range shall be: 0° to 38°C and Operating temperature range shall be : 0° to 50°C Shall be suitable for Humidity range: 10% to 95% RH Housing color shall be Frost White. Approvals: UL listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.						
	a) Rate of rise heat detector	Nos.	9				
	b) Fixed temperature heat detector	Nos.	2				
83.0	**ADDRESSABLE TYPE MANUAL PULL STATION:** Addressable type Manual						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	Call Station of red LEXAN, with molded, raised-letter operating instructions of contrasting color. Station will mechanically latch upon operation and remain so until manually reset by opening with a key common with the control units.Shall be with compact construction, suitable to Electronics module enclosure minimizes dust infiltration. Allows mounting in standard electrical boxes. Screw terminals for wiring connections. Activation of the MCS will required a firm downward pull to activate the alarm switch. The pull lever latches into the alarm position and remains extended out of the housing to provide a visible indication. UL Listed Temperature Range: 32° to 120° F (0° to 49° C) intended for indoor operation. Humidity Range: Up to 93% RH at 100°F (38°C) Housing Colour shall be Red with white raised lettering. Housing and pull lever shall be made with Lexan Polycarbonate or equal. The MCS shall be semi-flash / surface mount type. Approvals: UL listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.						
	Double action type	Nos.	24				
84.0	**STROBE WITH HORN :** Addressable type Horn with Strobe for Audible & Visible application, combination of Audible & Visible (A/V) Notification Appliances shall be listed to UL . The strobe light shall consist of a xenon flash tube and associated lens / reflector system. Provide a label inside the strobe lens to indicate the listed candela rating of the specific strobe. The horn shall have a minimum sound pressure level of 83 to 89 dB @ 24VDC. The audible / visible enclosure shall mount directly to standard single gang, double gang or 4" square electrical box, without the use of special adapters or trim rings. Shall be suitable to temperature range : 0° to 50° C Humidity Range: Up to 93% RH at 100°F (38°C) Approvals: UL listed / FM approved Country of	Nos.	24				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.						
85.0	**MONITOR MODULE :** Supply & installation of addressable - conventional interface module shall be used in the field wiring to connect the conventional Initiating devices with the addressable FACP interfaces to make the system convenient as when as required (configured by the service provider). The module shall be suitable for single address to the FACP on receiving signal from any conventional initiating device. The device shall be installed with a back box. The device shall be suitable for indoor use only. Shall be suitable to temperature range : 0° to 50° C Humidity range: Up to 90% RH at 35°C) Approvals: UL listed / FM approved. Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.	Nos.	9				
86.0	**ADDRESSABLE RELAY / CONTROL MODULE** Supply & Installation of Addressable Relay / Control Module shall be used in the field wiring to connect the conventional Initiating devices with the Addressable FACP interfaces to control / operate dampers, motors or similar appliances on receiving signal from the FACP as when as required (configured by the service provider). The device shall be suitable for indoor use only and shall be with back box. Shall be suitable to temperature range : 0° to 50° C Humidity Range: Up to 90% RH at 35°C) Approvals: UL listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.	Nos.	8				
87.0	**EMERGENCY LIGHT** Double tube, Length 12", Ceiling mounted Exit Light. Emergency lighting complying with international standards will be provided and comprise of single point, self-contained fittings with battery sized for minimum two hour illumination.	Nos.	33				
88.0	**EVACUATION LIGHT/ ROUTE** "Evacuation light" complete with	Nos.	37				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	rechargeable battery & charger light & others necessary accessories suitable for AC / Dc power supply (220v single phase).						
89.0	**EXIT LIGHT/SIGN** "Exit light" complete with rechargeable battery & charger light & others necessary accessories suitable for AC / Dc power supply (220v single p**hase).**	Nos.	24				
90.0	**FAULT ISOLATOR MODULE** Addressable type Isolator / Fault Isolator Module shall be used in the field wiring between the devices (contractor shall propose the quantity and location in the system required) to detect & isolate the devices at the time short circuit in SLC. The module shall be suitable to provide communications isolation to improve installation convenience and increase the system integrity. Isolation will be automatically activated when an output short circuit is detected (also be suitable for manual operation for isolation and trouble shooting for wiring problems). The device shall be suitable for indoor use only.Shall be suitable to temperature range : 0° to 50° C Humidity Range: Up to 90% RH at 35°C) Approvals: UL listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.	Nos.	12				
91.0	**AMPLIFIER (175W-300W)** Dual channel audio power amplifier with the following features: rated output power: at 8Ω 1KHz (per ch) 175 W, at 4Ω 1KHz (per ch 270W, at 8Ω 1KHz(bridge mono) input sensitivity (8Ω, 1KHz): ≤ 20Ω (balance / unbalance), input impedance: 10kΩ unbalance / 20Ω balance, slow rate (8Ω full swing): ±40V / use, frequency response (±0.5 dB): 10Hz~ 35 KHz etc. suitable for use in tropical country like BANGLADESH. Complete with required accessories and in conformity to specified codes & specification of international standard & CE / UL / CSA certified. Model & sample to be approved by the engineer.	Set	1				
91.1	**CEILING SPEAKER** Professional heavy duty, ceiling mounted speaker ideal for airports,						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	lounges, convention centers, corporate boardrooms, hotels / hospital, house of worship, museums, offices, spaces schools, theaters & theme parks, superior sound quantity, wide dispersion and smooth off-axis coverage with following specification: Frequency range (normal): 50Hz to 20 KHz. (±3 dB) nominal impedance: 8Ω, nominal sensitivity (1W,2m): 90dB SPL, component: LF & HF driver, suitable for use in tropical country like BANGLADESH. Complete with required accessories and in conformity to specified codes & specification of international standard & CE / UL / CSA certified. Model & sample to be approved by the engineer.						
	1.5W-6W	Nos.	37				
91.2	**COLUMN SPEAKER**						
	Supply, installation, testing of ceiling / wall speaker ideal for airports, lounges, convention centers, corporate boardrooms, hotels / hospitality, houses of worship, museums offices, of patois, spaces schools, theaters and theme parks, superior sound quantity, wide dispersion and smooth off-axis overage, superior sound quality, wide dispersion and smooth off axis coverage, fast and easy installation. Line voltage : 70V / 100V Sensitivity : 90dB Frequency response: 150Hz-15KHz. Hole cutting size @ 175mm Baffle size @ 185 Installation : ceiling Enclosure material : Plastic Line load resistance : 666Ω Dispersion angle : 100° Suitable for use in tropical country like BANGLADESH. Complete with required accessories and in conformity to specified codes & specification of international standards & CE /	Nos.	2				
92.0	**FIRE MAN TELEPHONE JACK** Fire fighter remote telephone jacks for connected to the emergency telephone system have screw terminals and a red backed enamel finish with a white silk-screened telephone hand set icon on them complete as required. **Listed: UL/ULC/EN/VDS/JIS**	Nos.	13				

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
93.0	**FIRE MAN TELEPHONE SETS** Supply installation testing & commissioning of single line telephone set for executive use with provision volume up+ down, redial, flash etc. including display with CID system complete. Suitable for use in tropical country like BANGLADESH complete with required accessories and in conformity to specified codes & specification of international standards & CE / UL / CSA certified. Model & sample to be approved by the Engineer	Set	1				
94.0	**ELECTRICAL WORKS FOR FIRE DETECTION SYSTEM**						
	Surface wiring (FR) (through PVC conduit): Surface conduit wiring with the following Fire & Flame Retardant FR (PVC) insulated and stranded cable and FR (PVC) insulated ECC wire connecting at both ends through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet pull box with 3 mm thick ebonite sheet cover, fixing materials, other accessories etc. including mending the damages good as required. All electrical contacts shall be of brass/copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC/BDS/BS/VDE standards and as per detailed specification mentioned in Annexure-A. The work shall be carried out as per direction/approval/acceptance of the Engineer. Cables manufactured by Govt. of Bangladesh owned / shared Company Ltd (Eastern Cables) approved by the Engineer.						
94.1	1C-2x1.5 sq.mm. (FR) cable with 1.5 sq.mm (FR) ECC wire through PVC pipe of minimum inner dia 20 mm having wall thickness of 1.5 mm	Rm	2,300				
94.2	1C-2x2.5 sq.mm. (FR) cable with 2.5 sq.mm (FR) ECC wire through PVC pipe of minimum inner dia 25 mm having wall thickness of 1.5 mm	Rm	800				
95.0	**ELECTRICAL WORKS FOR FIRE PA SYSTEM:** Alda 10 GA speaker cable through pvc conduit, tray/ ladder complete with bends, tees, junction box etc.	Rm	300				
96.0	**ELECTRICAL WORKS FOR FIRE FIREMAN TELEPHONE SYSTEM :** Supplying and drawing of following						

Item No.	Description of Item	Unit	Quantity	Unit Rate (BDT)		Amount (BDT)	
				In figures	In words	In figures	In words
1	*2*	*3*	*4*	*5*	*6=5*	*7=4x5*	*8=7*
	sizes PVC insulated & sheathed twisted pair telecommunication cables having Dia. of each core is 0.6 mm through pre-laid pipes. Cable manufacturer(s) must have valid test certificate from internationally accredited laboratory (like CPRI, KEMA etc.) approved / accepted by the Engineer.						
	1C-4x0.282 sqmm (2 pair)	Rm	200				
97.0	**SHOP DRAWING & DOCUMENTATION :** Preparation of detail Shop drawing including, layout drawing, section details, schematic drawing, etc. Get approval of shop drawing before any fabrication or installation works. Shop drawing must be coordinated with other services likely Electrical cabling, Light Fixtures, False Ceiling and Interior design. The work also includes: a)Show actual dimension of Equipment. b) Submit actual Wattage rating of all equipment c) Reconfirm Electrical cable sizing d) Submit Electrical connection diagram of Electric Panels e) Submit General arrangement of Electric Panels f) Submit advance copy of Installation, Operation and maintenance manuals.	Job	1				
98.0	**AS-BUILT DRAWING :** Preparation and submission of As-built drawing in following forms: One set in tracing paper, size A1 Two sets print out in A1 Paper Soft Copy in CD in AutoCAD Version 2010 Soft Copy in PDF Version	Job	1				
99.0	**TESTING, COMMISSIONING & BALANCING :** After proper installation and certification the system shall be tested, commissioned and balanced as per direction and recommendation by the Manufacturer as well as Designer.	Job	1				
100.0	**TAGGING, IDENTIFICATION & SIGNAGE INDICATION :** As per NFPA Code.	Job	1				
101	Engineer's site office of minimum & Labour Shed for labour accomodation	Each	1				
102	Environmental Management Plan as per Bid Document	LS	1				
	Total						
	In Word						

LIST OF RECOMMENDED MANUFACTURERS

Water Chiller	Carrier/Trane/Dunham Bush/Daikin/Rhoss/AERMEC
Fan Coil Unit	Carrier/Trane/Dunham Bush/Daikin/Rhoss/AERMEC
Fans	Nicotra / Fantech / S&P / Chicago / Rhoss/ GEC-Woods / Kruger / Systemair/ Sodeca / Casals/ Blauberg or equivalent.
Pumps	Ajax / Grundfos / Monoflo / Bell & Gosset / Rhoss/ Paco / Paragon / Calpeda /Armstrong / Wilo / Ebitt/General or equivalent.
Pump Motor	Siemens / Teco / GEC / ABB / Toshiba / Calpeda / EMM or equivalent.
Valves, Y-Strainer, Flexible Pipe Connection	Crane / Kitz / Nibco / Tozen / Toyo / Maple/ Metraflex / AFA / Birflex / Ekoval / TECOFI / Caleffi or equivalent.
Balancing Valve	Tour and Anderson / Crane / Combi / FlowCon / Oventrop/ TECOFI/ Caleffi or equivalent.
Vibration Isolation / Silencer	Mason Industries / Kinetics or equivalent.
Water Treatment Chemicals	Ecolab / Water Services UOP / Mazer Chemicals/Petaling or equivalent.
Pressure Gauge Pipe Thermometer	Hunter / Weksler / Brannan / Metraflex / Clayton / Singer / Taylor /Maple/Tozen / Caleffi or equivalent.
Water Flow Meter (Digital)	Data Industrial/Asahi/Aichie Tokei/Blue White/Calffi or equivalent.
Insulation (Rockwool / Glass wool)	Bradford / Polyglass / Foster / Byuksan /Polywool or equivalent.
Insulation (PEF / Nitrile Rubber)	Superlon / Wide / Armaflex / Armacell / Aerocell/ ALP Aeroflex or equivalent.
Duct Insulation (PE insulation)	Jumboo / Polycell or equivalent.
Flexible round duct	Thermaflex / Aeroduct / Civa Flex / Ruskin / Titus or equivalent.
Air Terminals, Variable Air Volume	Titus / Price / Connols-Aire / Trox / System Aire / Halton / Ruskin / Bavcol Air/ Acutherm /Belimo or equivalent.
Automatic Controls system	Johnson Controls/Honeywell / Siemens / Delta/ Regin or equivalent.
Flow Switch	Johnson Controls/Honeywell / Siemens / Delta or equivalent.
Control Valve	Johnson Controls/Honeywell / Siemens/ Belimo/Regin or equivalent.
Expansion Tank (Closed type)	Automatic Heating Appliances / Pneumatex / Monoflo / Emtrol/Reflix or equivalent.
Electrical Components	AEG / Siemens / Telemecanique / GE / ABB / Dorman smith / MEM / Merlin Gerin or equivalent.
Variable Frequency Drive	Siemens / Danfoss / Telemechanique /ABB/Yaskawa or equivalent.
Modulating Control Valve	Siemens, Johnson controls, Belimo, Honeywell or equivalent.
Air Filter / Safe Change Filter (BIBO)	Camfil / Flanders / AAF / Air Guard / Faar / Trox or equivalent.
Electric Cable	Paradise / BRB / BBS or equivalent.
Fire Damper	Trox/Connols Aire/Ruskin or equivalent.
Pre-insulated pipe	SeAH/ Ricwil/ Husteel/ Glensule or equivalent.

RECOMMENDED LIST OF MATERIALS AND MANUFACTURERS

Equipment	Manufacturer
Fire Pumps and Accessories	
Fire Pump and Jockey Pump	Patterson USA/ KSB, Germany/ Grundfos, Denmark/ NAAFCO, UAE/ Xylem, USA/ SFFECO, UAE/ Lifeco, UAE/ Ebitt, Turkey/ Wilo, Germany/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Diesel Engine	Cummins USA/ Catterpillar USA/ Clarke-Gem USA/ Detroit, USA/ Parkins, UK/ Fire Driver, UAE/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Valves and Accessories	Nibco USA/ Stockham USA/ Mueller USA/ ITT Grinnel USA/ Keystone USA/ KSB, Germany/ Shield, UK/ Rapidrop, UK/ Tozzen, Japan/ Kenedy USA/ Rapidrop, UK/ Val-Matic USA/ Metraflex USA/ ITT-Hoffman USA/ Bell & Gossett USA/ Apco USA/ Armstrong USA/ Claval, USA/ NAFFCO, UAE/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Water Flow Meter	Gerand USA/ Eagle Eye-Annubar USA/ Meriam Instrument USA/ Global Vision USA/ Meccan USA/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**

Pressure Gauge	March USA/ Trerice USA/ Weksler USA/ Jumo Germany/ Wika Germany/ Rueger SA Switzerland/ Shield, UK/ **Or equivalent**
Alarm Valve	Viking USA/ Gem USA/ Chemetron USA/ Firematic USA/ Shield, UK/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Sprinkler Head **Fire Hose Reels & Cabinets**	Gem USA/ Viking USA/ Central USA/ Reliable USA/ Tyco, USA/ NAAFCO, UAE/ Ardenoak UK/ Angus UK/ Macron UK/ Shield,UK/ Potter, USA/ Rapidrop,UK/ Spark, UK/USA/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Fire Alarm Equipment	Johnson Control USA/ Honeywell USA/ NOHMI, Japan/ Edwards USA/ Fire-Lite USA/ Aritech USA/ Pyrotronics USA/ Ademco USA/ Kidde USA/ Gamewell USA/ Simplex USA/ Mirtone Canada/ Wormald Australia/ Shield, UK/ Simplex/ Bosch/ Cooper Fire, UK/ Ansul USA/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Fire Barrier System	3M USA/ GE USA/ Wormald USA/ Furukawa Japan/ KBS Germany/ NM Fire, France/ Lifeco, UAE/

	Or equivalent
Foam System	Chemguard USA/ Buckeye USA/ Ansul USA/ National Foam, USA/ NOHMI, Japan/ NAFFCO, UAE NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Clean-agent Suppression System	Chemguard USA/ Buckeye USA/ Ansul USA/ NOHMI Japan/ DUPONT, USA/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Smoke Curtain	Stoebich/ Coopers Fire/ Colt/ Kent/ **Or equivalent**

This Bill of Quantities contains [**insert number**] corrections duly initialled and signed by the authorised person of the Tenderer

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Note

1. It is suggested that the Tenderer uses these sheets of the BOQ in order to avoid any manipulation, distortion and inadvertent mistakes or omissions in course of preparing the Tender by the Tenderer
2. Follow the Guidance notes under **Section 6** in filling this Schedule

Section 7. General Specifications

MAINTENANCE AND PROTECTION OF TRAFFIC

General

The Contractor shall at all times maintain the traffic flow along existing roads, rivers and canals and take all necessary measures for the safety of traffic, pedestrians and workers. The Contractor shall provide, erect, operate and maintain signs, markings, lights, barricades and traffic control equipment in accordance with the Bangladesh Road Transport Authority's Traffic Signs Manual, unless otherwise directed by the Engineer. The Contractor shall provide and maintain all detours, temporary roads, temporary bridges, necessary barricades, warning lights and signs as well as other equipment at all hours during the day or night.

The Engineer's approval of plan and section drawings of proposed detours, temporary roads and temporary bridges shall be obtained by the Contractor before any work is commenced. Where the work site takes up part of the road only, and the full width of the road can be restored for night time traffic, the Engineer may give permission for control of the traffic through the works area by use of flagmen or electronically controlled mobile traffic lights, without the need for construction of bypass roads, but the Engineer's approval will only be given if, and while, the Contractor demonstrates that sufficient resources are applied and maintained for this purpose.

Where construction interferes with the existing roads, track and footpaths, other than as noted above, provision shall be made to a similar standard that existed prior to the works for the free movement of traffic and pedestrians. The Contractor shall take all necessary steps to avoid or minimise delays and inconvenience to road users during the course of the works.

Notwithstanding the above any diversion of the National and Regional Highways shall comply to at least the minimum standard stated as following:

- Minimum carriageway width of 7.3 metres.
- Minimum horizontal radius of 150 metres.
- Maximum gradient of 1 in 33.
- The construction shall be sufficient for the smooth uninterrupted passage of all traffic and have a bituminous surface.

Notwithstanding the above any diversion of Feeder Roads shall comply to at least the minimum standard stated as following:

- Minimum carriageway width of 5.50 metres.
- Minimum horizontal radius of 100 metres.
- Maximum gradient of 1 in 33.
- All weather surfaces.

The Contractor shall supply all temporary signs, lights and other equipment, to the approval of the Engineer, to ensure smooth and safe flows of traffic. Also the Contractor shall take all reasonable precautions to prevent damage to vehicles from construction equipment or materials and shall be responsible for any claims arising from such damage.

The Contractor shall in due time and at least seven days before any diversion, interruption or impediment to traffic takes place, submit a detailed stage programme for the Engineer's approval. The programme shall show all arrangements necessary to ensure a smooth traffic flow. Upon completion of the Works, all temporary roads, temporary bridges, barricades, signs and other equipment shall be completely removed, unless otherwise approved in writing by the Engineer. From the date of Commencement of the Contract to the date of the Completion or Partial Completion Certificate the Contractor shall also be responsible for maintenance of, and repair of damage, to all existing features, constructions, structures, pavements etc. which come within the limits of the site irrespective of the cause of the damage, unless that cause is determined to be an accepted risk and the repairs are determined to be a compensation event.

If in the opinion of the Engineer the Contractor has failed to properly repair or maintain existing or temporary construction, or provide sufficient or appropriate warning signs, lights, barricades etc. he shall instruct the Contractor, in writing, to provide such signs as he considers appropriate for protection of traffic, pedestrians, employees and the works. If the Contractor fails to respond within the time given by the Engineer, the Engineer may suspend works which interfere with traffic until such time as the Contractor provides sufficient signs etc. as the Engineer has directed, or the Engineer may arrange to provide the required signs etc. at cost to the Contractor, these costs being deducted from monies due to the Contractor under the Contract. These costs will include any costs for missing or stolen items not returned to the Engineer at the completion of works or when replaced by the Contractor.

The construction and ultimate removal of all temporary constructions as well as the provision of barricades, signs and other equipment shall be paid for at a lump sum price. This sum shall cover all earthworks, temporary bridging and culverts, pavement and surfacing materials, warning signs, lights, control of traffic including single lane working, by day and by night, and all other items to ensure the smooth and safe flow of traffic.

Where temporary bridging materials, such as Bailey Bridge components are supplied to the Contractor, these will be delivered to the Site. The Contractor shall be responsible for the care of all materials supplied to him and shall bear all costs associated with repair and replacement due to damage and loss.

The maintenance and repair of existing and temporary constructions, and equipment provided for the maintenance and protection of traffic flows shall be paid for at a daily rate. When the Engineer issues an instruction requiring the Contractor to provide; repairs, maintenance, or additional temporary signs, lights, barricades or any other such feature, every day the Contractor fails to comply with the instruction to the satisfaction of the Engineer, the day shall not be included for payment and a corresponding pro rata deduction shall be made to the Lump

Sum for establishment of temporary construction and provision of signs etc. noted above. This means that for every day the Contractor fails to comply with the Engineer's instruction there will be no payment made for establishment and maintenance of temporary works and signs for the whole of the site.

Additional fill material used for temporary diversions outside the lines shown on the cross sections and plans for the permanent works may be allowed to remain in place on completion of the Works, provided it is trimmed to levels and slopes approved in writing by the Engineer and all additional costs such as extending drainage and for additional grassing to shoulders and side slopes are at the cost of the Contractor.

FIELD OFFICE FOR THE ENGINEER AND OTHER FACILITIES TO BE PROVIDED BY THE CONTRACTOR

Field Office for the Engineer and his Staff

In addition to the office space required for his own use, the Contractor shall provide and maintain a furnished field office for the use of the Engineer and his staff. Requirements for the office, including overall size, number and size of individual rooms, construction and furniture are stated in Particular Specifications Clause 1.2.1 in Section 6 of Volume 1 - The Tender.

The field office shall be maintained in a secure and watertight condition by the Contractor until completion of the Works or as otherwise instructed by the Engineer and shall be provided with electricity, running water and sewerage. All doors shall be fitted with approved locks, and windows shall be provided with mosquito screens and blinds and shall have interior locking devices.

The Contractor shall submit for the approval of the Engineer before construction, plans and drawings showing proposed details and location for the field office, including foundations, access roads, shades, layout of electrical and water supplies and hard standings thereto. The Engineer may require revision of the plans prior to giving approval for construction. The Contractor shall also submit details of proposed furniture and fittings to the Engineer for approval. These items shall generally be of the best quality obtainable locally.

The office, complete with furnishings, fittings, access roads and hard standings shall be ready for occupation by the Engineer within four weeks of the date when the Contractor first occupies the site.

The Contractor will provide all necessary MLSS (Members of Lower Service Staff) for the field office, including day and night security guards and a tea boy. The Contractor will also provide a competent computer operator. Staff considered unsuitable by the Engineer shall be replaced.

The Contractor shall arrange for the field office to be regularly and properly cleaned and for access roads and hard standings to be maintained in a well drained and trafficable condition. All furnishings and fittings in the field office shall also be maintained by the Contractor in working condition and to the approval of the Engineer.

All materials recovered from dismantling the office and removing access roads, hard standings etc., should be stockpiled on site as approved by the Engineer and along with all furniture and fittings will be the property of the Employer.

Where suitable buildings are available within the general limits of the site of the works the Contractor may propose to the Engineer that the buildings be rented. The buildings must

conform with all the criteria above and if deemed to be satisfactory, the Engineer may accept their use as offices.

Sanitation

The Contractor shall provide adequate water-borne sanitation and refuse collection and disposal, complying with the Laws of Bangladesh and all local By-Laws, and to the satisfaction of the Engineer, for all offices, laboratories, workshops, houses etc. erected on the Site.

Office Equipment and Consumables

The Contractor shall provide and maintain the office equipment such as photocopy machines and computers for the Engineer's field office as listed in Particular Specifications Clause 1.2.3 in Section 6 of Volume 1-The Tender. Equipment supplied will be subject to the approval by the Engineer. The Contractor shall supply all consumables related to the equipment and arrange for the equipment to be maintained, including servicing at intervals recommended by the respective manufacturers. Upon completion of the Works or as otherwise instructed by the Engineer, the equipment shall become the property of the Contractor.

The Contractor shall provide and maintain in working order/good condition, as applicable, the items of kitchen equipment listed in Particular Specifications Clause
1.2.3 in Section 6 of Volume 1-The Tender.

The Contractor shall provide all standard stationery items to the Engineer's field office, along with kitchen and bathroom supplies as may be required by the Engineer throughout the duration of the contract.

Sign Boards

The Contractor shall provide identification sign boards, of the number and size stated in Particular Specifications Clause 1.2.4 in Section 6 of Volume 1-The Tender, and maintain them in good condition. All information on the signboards will be written in English and Bengali. The signboards will be positioned as directed by the Engineer. The Contractor shall submit proposals for the materials of the signboards, the text layout and installation of the signboards on Site to the Engineer for approval. Each sign shall show:

- the name of the Project
- the name of the Employer
- all other details as required by the Engineer

The Contractor shall remove the sign boards on completion of the Works or when instructed by theEngineer

TESTING OF MATERIALS

Contractor's Site Laboratory

The Contractor shall provide and maintain a site laboratory for the use of the Contractor and the Engineer including furniture, testing equipment and consumable stores necessary to carry out the tests listed in Particular Specifications Clause 1.3.1 in Section 6 of Volume 1-The Tender. The laboratory shall be constructed with a reinforced concrete floor (minimum thickness 150mm) and brick walls. The building shall be watertight and provided with electricity, potable running water and sewerage connections. The location of septic tank(s) and soak-away(s) is to be

approved by the Engineer. Doors shall be fitted with approved locks, and windows shall be provided with mosquito screens and blinds and shall have interior locking devices.

The Contractor shall submit for the approval of the Engineer before construction, plans and drawings of the proposed laboratory indicating location, overall size, construction details and layout of benches, washing facilities, furniture, testing equipment, sample storage etc. The Engineer may require revision of the plans prior to giving approval for construction. The Contractor shall also submit details of proposed testing equipment, furniture and fittings to the Engineer for approval.

The Contractor shall maintain the laboratory, furniture, fittings and testing equipment for the duration of the Contract and replace any part or item that is irreparably damaged or lost. The Contractor shall pay all expenses in respect of water, electricity and other consumables necessary for the running of the laboratory and shall arrange for the laboratory to be regularly cleaned.

The Contractor shall not be permitted to commence permanent works requiring on- Site testing until the Site laboratory is complete in all respects, unless temporary testing procedures proposed by the Contractor have been approved by the Engineer.

At the end of the Contract, all materials recovered from dismantling the laboratory, together with all furniture, fittings and testing equipment will remain the property of the Contractor.

Special and Additional Testing

In addition to the testing described in Specifications Sections, the Engineer may require further testing to be carried out. Such special and additional testing shall be arranged by the Contractor under the direction of the Engineer.

Staff for Materials testing

The Contractor shall provide qualified laboratory engineers, technicians, assistants, labourers, etc. to carry out sampling and testing of materials in accordance with Specifications Sections. Laboratory staff shall be subject to the approval of the Engineer and be available to assist the Engineer with materials testing, as and when required.

TRANSPORT FOR THE ENGINEER

General

The Contractor shall provide and maintain road and river transport for the exclusive use of the Engineer, his representatives and representatives of the Employer.

Items of Transport

Road transport, which shall be used both on and off the Site, shall include saloon cars of 1200 cc capacity, double cab pick-ups, four wheel drive vehicles with a minimum of 6 seats and motor cycles of 125 cc capacity.

River transport shall be motor boats of minimum length 5 m suitable for carrying out survey and inspection work and shall have covered deck areas to give protection from the sun and rain.

No persons of either the Engineer's or Contractor's staff other than authorised boatmen shall be allowed to operate the boats.

The Bill of Quantities indicates the requirements for road and river transport. When items of transport are out of use for repairs, servicing etc., equivalent substitutes shall be provided by the contractor.

Items of transport and drivers or boatmen considered unsuitable by the Engineer shall be replaced.

RELOCATION OF PUBLIC UTILITIES

Description

The Contractor shall be responsible for establishing the locations of all public utilities within the Site of the Works, and for their protection.

Where the necessity for the permanent relocation of public utilities has been identified, details will be indicated on the Drawings.

Should the Contractor consider that the temporary diversion of public utilities is necessary in order to carry out Contract works, he shall submit details of his proposals to the Engineer.

Relocation works will normally be undertaken by the concerned authorities, with which the Contractor will be expected to liaise. The Contractor shall indicate relocation works in his ContractProgramme.

GENERAL CONTRACTOR'S OBLIGATIONS

Site Establishment, Maintenance and Demobilisation

The Contractor is to allow for the provision, maintenance and removal at the end of the Contract of all offices, stores, covered workshops, canteens, toilet facilities etc. for his own use, required to execute the Works in accordance with the Contract Documents. In addition, the Contractor is to allow for complying with his obligations for safety, security and protection of the environment described in the Contract Documents.

Provision of Insurances

This item is for the provision of insurances as required in accordance with Clauses. The minimum amount of third party insurance shall be as stated in the Contract Data. Failure to provide insurance will result in no interim payments.

As-Built Drawings

The Contractor shall furnish sets of as-built Drawings of the Works to the Engineer, showing the permanent works as actually constructed, within one month of completion of the Works. Included in the sets of as-built Drawings will be revisions of Tender Drawings and Drawings supplied to the Contractor during the Contract as well as revisions of drawings supplied by the Contractor during the Contract. The As-built drawings submitted by the Contractor will be subject to the approval of the Engineer.

The Technical Specification is described in below:

Item No.	Description of Item
1	*2*
1	Supplying, fitting and fixing foreign (China or equivalent) made polished porcelain/ mirror polished/Glazed porcelain homogeneous floor tiles complying BDS ISO 13006: 2015, water absorption ≤ 0.5%, modulus of rupture (MOR) ≥ 35 N/mm2, irrespective of color &/or design, with cement sand (F.M. 1.2) mortar (1:4) base and raking out the joints with white cement including cutting and laying the tiles in proper way and finishing with care etc. all complete and accepted by the Engineer-in-charge. (Cement: CEM-II/A-M) In ground floor. Polish porcelain/ mirror polished/ Glazed porcelain (Marbel Shaded) 600 mm x 1200 mm floor tiles
2	Supplying, fitting and fixing foreign (China or equivalent) made glazed wall tiles complying BDS ISO 13006: 2015, irrespective of color &/or design, with 20 mm thick cement sand (F.M. 1.2) mortar (1:3) base and raking out the joints with white cement including cutting, laying and hire charge of machine and finishing with care etc. including water, electricity and other charges complete in all respect and accepted by the Engineer-in-charge. (Cement: CEM-II/A-M). In ground floor. Glazed wall tiles 600 mm x 2400 mm
3	Supplying, fitting and fixing foreign (China or equivalent) made glazed wall tiles complying BDS ISO 13006: 2015, irrespective of color &/or design, with 20 mm thick cement sand (F.M. 1.2) mortar (1:3) base and raking out the joints with white cement including cutting, laying and hire charge of machine and finishing with care etc. including water, electricity and other charges complete in all respect and accepted by the Architect-in-charge. (Cement: CEM-II/A-M). In ground floor. Glazed feature wall tiles (600 mm x 1200 mm, 800X800 mm, 450X900 mm, 300X600 mm, 200X 1200mm & if any other tiles according to the design of architect)
4	Supplying, fitting and fixing foreign (China or equivalent) made GP homogeneous stair tiles having non skidding offsets, complying BDS ISO 13006: 2015, water absorption ≤ 0.5%, modulus of rupture (MOR) ≥ 27 N/mm2, irrespective of color &/or design, with cement sand (F.M. 1.2) mortar (1:4) base and raking out the joints with white cement including cutting and laying the tiles in proper way and finishing with care etc. all complete and accepted by the Engineer-in-charge. (Cement: CEM-II/A-M) In ground floor. Glazed stair tiles of size 300 mm x 600 mm, anti slip.
5	Supplying, fitting and fixing plain particle board / MDF board ceiling (complying unit wt 499 to 550 kg/m3, bending strength 0.35 N/mm2, max swelling 8%, moisture content not more than 10%), of 12 mm thick with best quality and well seasoned Garjan wood frame of section 70 mm x 30 mm at 600 mm x 600 mm in grid suspended from ceiling or roof or beam by 12 SWG double ply G.I. wire fixed to the ceiling by rowel plug, screws, hooks, nails etc, maintaining straight lines and desired finished level at bottom face including vertical strut as required, cutting holes in slabs or beams by electric drill machine and mending good the damages, if any during execution of the work, also including

Item No.	Description of Item
1	*2*
	cost and carriage of all materials, accessories, labour for installation, electricity charge, scaffolding, screws, nails, Duco Paint over a coat of priming etc. all complete, as per drawing design and accepted by the Engineer-in-charge.
6	Supplying, fitting and fixing of 0.7 mm thick perforated/plain Metal board false ceiling with aluminum frame suspended from ceiling false ceiling of size 600 mm x 600 mm, powder coated of approved design, framing by aluminium T-bar of natural anodized finish suspended in 600 mm x 600 mm grid from ceiling by 12 SWG double ply wire, fixed to the ceiling by rowel plug, screws, hooks, nails etc., maintaining straight lines and desired finished level at bottom face including vertical wooden strut as required, making holes in slabs or beams by electric drill machine and mending good the damages, if any during execution of the work, also including cost of all materials, electricity, accessories, scaffoldings, labour for installation, screws, nails, etc. all complete as per drawing, design and accepted by the Engineer-in-charge.
7	Supplying, fitting and fixing 12 mm thick burma teak (BT) veneered board in walling with best quality and well seasoned garjan wood frame of section 70 mm x 30 mm at 600 x 600 mm in grid, fitted and fixed to wall by plugs, nails, screws etc. including treatment of inner surface with termite and damp proofing agent maintaining leveled and finished exposed faces including. making holes in wall and mending good the damages, if any during execution of the work, also including cost and carriage of all materials, electricity, accessories, labour for installation, scaffolding, screws, nails etc. including Duco Paint over a coat of priming etc. all complete as per design, approved sample and accepted by the Engineer-in-charge.
8	Supplying, fitting and fixing stainless steel (SS) stair railing of standard height with 2 mm thick 62 mm dia pipe for hand-rail, 6 nos 62 mm x 50 mm x 2 mm vertical box in each flight, 2 mm thick 25 mm dia 5 nos horizontal pipes as per drawing, design including carrying, polishing fabricating, welding and fixing with tread by 25 mm long royal bolt etc. all complete and accepted by the Engineer-in-charge.
9	Supplying, fitting and fixing 10 mm thick tempered glass railing in stair with 62 mm dia 2 mm thick SS pipe for hand rail, 2 nos 62 mm x 50 mm x 2 mm vertical pipe in each flight & 3 nos 62 mm x 50 mm x 2 mm vertical pipe in each landing fitted and fixed with 65 mm x 55 mm x 6 mm SS base plate including welding, bending, fabricating, polishing all complete as per drawing, desing and specification etc all complete in all respect and accepted by Engineer-in-charge.
10	Supplying, fitting and fixing 10 mm thick clear tempered glass door including all accessories, 1 set floor mounted auto door closure, special quality 2 nos. clamping devices, 1 set locking device, top hinge and handle etc. complete in all respect as per drawing and direction of the Engineer-in-charge.
11	Supplying, fitting and fixing of 10 mm thick clear tempered glass wall upto 3.0 m height with vertical fin glass support of same thickness and support shall be at least 1.2 m c/c fixed properly with glass by silicon

Item No.	Description of Item
1	*2*
	glue with supply and fittings of all required accessories such as SS u channel, nut bolts, aluminium angle, steel rowel bolt, screws , rivets norton tape masking tape, structural sealant, gum bracket rod etc. all complete in all respect as per drawing and direction of the Engineer-in-charge.
12	Supplying, fitting and fixing 38 mm thick finished well matured seasoned (minimum 250 mm wide plank) wooden grooved single panel flush door shutters with top and middle rail 100 mm x 38 mm, bottom rail 225 mm x 38 mm and style 100 mm x 38 mm, having vertical panels 100 mm x 38 mm including keeping 6 mm x 12 mm even groove all around and minimum 12 mm grooved lap to each panel. Providing 4 (four) nos best quality 100 mm long iron hinges, 12 mm dia best quality 200 mm and 250 mm long iron socket and tower bolts, 2 (two) nos heavy type best quality nickel plated handles long, 1 (one) no best quality hasp bolt, hinged cleats, 1 Door closer, wooden buffer blocks including supply of necessary nails and screws, finishing by sand papering etc. complete in all floors as per drawing and accepted by the Engineer-in-charge. (All sizes of wood are finished).
13	Add for each additional floor up to 5th floor
14	Supplying, fitting and fixing 10 mm thick tempered glass railing in verandah with 62 mm dia 2 mm thick SS pipe for hand rail, 5 nos 62 mm x 50 mm x 2 mm vertical box fitted with concrete slab by 65 mm x 55 mm x 6 mm SS plate @ 600 mm c/c including all fittings, fixtures as per drawing, desing and specification etc all complete in all respect and accepted by Engineer-in-charge.
15	Supplying, fitting and fixing 18 mm thick burma teak (BT) veneered board louver ceiling (complying unit wt 499 to 550 kg/m3, bending strength 0.35 N/mm2, max swelling 8%, moisture content not more than 10%), with best quality and well seasoned Garjan wood frame of section 75 mm x 38 mm at 600 mm x 600 mm in grid suspended from ceiling or roof or beam by 12 SWG double ply G.I. wire fixed to the ceiling by rowel plug, screws, hooks, nails etc, maintaining straight lines and desired finished level at bottom face including vertical strut as required, cutting holes in slabs or beams by electric drill machine and mending good the damages, if any during execution of the work, also including cost and carriage of all materials, accessories, labour for installation, electricity charge, scaffolding, screws, nails, including Duco Paint by 2 coats over a coat of priming etc. all complete, as per drawing design and accepted by the Engineer-in-charge.
16	Supplying, fitting and fixing 12 mm thick MDF Jali over 12mm thick Gorjon ply board in walling with best quality and well seasoned garjan wood frame of section 70 mm x 30 mm at 600 x 600 mm in grid, fitted and fixed to wall by plugs, nails, screws etc. including treatment of inner surface with termite and damp proofing agent maintaining leveled and finished exposed faces including. making holes in wall and mending good the damages, if any during execution of the work, also including cost and carriage of all materials, electricity, accessories, labour for installation, scaffolding, screws, nails etc. including Duco Paint over a

Item No.	Description of Item
1	*2*
	coat of priming etc. all complete as per design, approved sample and accepted by the Engineer-in-charge.
17	(i) Square panel ENERGY+ Model: EPPLLED 2001 or equivalent product of ENERGY+ / SUNKO / ENERGYPAC / etc. (ii) Rated life: 30,000 hr. (minimum) (iii) luminous flux : 100 + 1m/w (iv) LED chips : EDISON / EPISTAR / OSRAM / PHILIPS / CREE / BRIDGELUX. (v) Driver: MEANWELL / OSRAM / PHILIPS / IEC standard. (vi) Size : 600 mm x 600 mm **48 W (2' x 2')**
18	(i) GLORIA cat. no.- Gcdl-332 (7 W / 9 W / 12 W)or equivalent product of ENERGYPAC / ENERGY + etc. (ii) Rated life : 30,000 hr. (minimum)(iii) Luminous flux : 100 + 1m/w(iv) LED chips : EDISON / EPISTAR / OSRAM / PHILIPS / CREE/ BRIDGELUX.(v) Driver: MEANWELL / OSRAM / PHILIPS / IEC standard.
19	Supply & fixing of the following LED bulbs & tube lamps manufacturers by ENERGY+ / MEP / HARMONICS / ELECTRO / SUNTEC / GE / TRANSTEC / ENERGYPAC or equivalent brand accepted / approved by the Engineer. **600 mm / 2'- 9 / 10 watt-T5 AC LED tube Lamp**
20	Supply & fixing of LED spot light fitting of the following features and model with all necessary elements such as driver, chips etc. complete. Model & sample shall be approved by the Engineer. (i) Round panel (surface type) ENERGY+ cat. No. - EPPLLED 2006 or equivalent product of GLORIA / SUNKO / ENERGYPAC / ASHA etc. (ii) Rated life: 30,000 hr. (minimum) (iii) luminous flux : 100 + 1m/w (iv) LED chips: EDISON / EPISTAR / OSRAM / PHILIPS / CREE / BRIDGELUX. (v) Driver: MEANWELL / OSRAM / PHILIPS / IEC standard. **24 W**
21	Supply & fixing of LED bath-room light fitting of the following features and model with all necessary elements such as driver, chips etc. complete. Model & sample shall be approved by the Engineer. (i) ENERGY + cat. no. - EPML-10024 or equivalent product of GLORIA / SUNKO / ENERGYPAC etc. (ii) Rated life : 50,000 hr. (minimum) (iii) Luminous flux : 100 + 1m/w (iv) LED chips : EDISON / EPISTAR / OSRAM / PHILIPS / CREE/ BRIDGELUX. (v) Driver: MEANWELL / OSRAM / PHILIPS / IEC standard.
22	Providing & fixing the fancy bracket light fitting of the following manufacturer's model & catalogue number with carrier, brass holder, earth terminal, necessary wiring with 2 x 0.4 sq.mm stranded PVC

Item No.	Description of Item
1	*2*
	insulated flexible FR cable etc. Suitable for use CFL & LED lamp (except lamp) complete sample accepted / approved by the Engineer. ENERGY+ cat. no. EPWB 3003 / 1 W or equivalent product of GLORIA / SUNKO / CRESCENT / SHWASH / ASHA etc.
23	Providing and fixing single phase distribution board (SPDB) [concealed / surface] having the following components and specifications: [Fig : 4.2] 1. Steel board : size 20"x15"x4" MS sheet : 18SWG with hinged type door and locking arrangement duly painted with powder coating with epoxy polyester resin on all surfaces of board (gray / off-white) etc. Infront side there will be tempered thick fiber glass with rubber gaskets to observe the inside arrangement. 2. Copper bar: size 10"x 1"x 3mm (2 nos.) and 6"x 1"x 3mm (1 no) mounted on insulator capacity: 60-100A at both ends. 3. 1 no. DPSPMCB (main control) and following nos. SPMCB ,DPSPMCB and SPMCB manufactured and tested in accordance with relevant IEC / VDE / NEMA / BS / JIS standard. Minimum breaking capacity 6/10 KA with thermal overcurrent and instantaneous electromagnetic short circuit release. 4. Loop Cable [from phase bar to SPMCB(circuit&power)] size: 1c-1x2.5sqmm (BYM) With DPSPMCB and SPMCB'S of MEM / ABB / HAVELLS / LEGRAND / FEDERAL /HAGER / VITZRO or equivalent brand accepted / approved by the engineer. (Manufactured by RECO / NASCO / C&S or equivalent product of any other manufacturer) 10-way SPDB incoming : 1x100A DPSPMCB outgoing : 10x5-10A SPMCB
24	Providing & fixing 250 volt single phase 3-pin combined switch socket outlet (surface / Concealed type) manufactured and tested in accordance with relevant IEC / VDE / NEMA / BS / JIS standards mounted on required size 18 SWG galvanized plain sheet board / Plastic Board (Self-extinguishing 650oC) of 76.2 mm. (3") depth. (Manufacturer shall have certificate of standard which they follow). **13 / 15 / 16 / 20 Amps. Made in ENGLAND / GERMANY / JAPAN / USA or EU countries.**
25	Providing & fixing 250 volts. 5 / 6 amps (minimum) concealed type following switch / switch socket manufactured and tested in accordance with relevant IEC / VDE / NEMA / BS / JIS standards mounted on required size 18 SWG galvanized plain sheet / PVC board (Self-extinguishing 650oC) of 76.2 mm (3") depth. All electrical contacts shall be of brass / copper. (Manufacturer shall have certificate of standard

Item No.	Description of Item
1	*2*
	which they follow) Four gang switch
26	One gang switch & one 5 amps. 2-pin socket combined.
27	Concealed conduit wiring for following point looping at the switch board with earth terminal with 1C-2x1.5 sqmm PVC insulated and sheathed stranded cable (BYM) & same size PVC insulated ECC (BYA) (Green / White color) including circuit wiring with IC-2x2.5 sqmm PVC insulated and sheathed stranded cable (BYM) & same size PVC insulated ECC (BYA) Green / White color through PVC conduit (one conduit from switch board to common point on ceiling is considered to draw 3 pair of cable) of reputed manufacturer of minimum 25 mm Dia. & 1.5 mm wall thickness complete with 18 SWG GP sheet / PVC switch board & pull box with 3mm thick ebonite sheet cover, without switch, fixing materials etc.(without switch) as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer. Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer. **Light/ exhaust or wall bracket fan point**
28	Surface conduit wiring with the following PVC insulated and sheathed cable (BYM) & Green / White colour PVC insulated ECC wire (BYA) through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet pull box with 3 mm thick ebonite sheet cover, fixing materials, other accessories etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer. Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer.

Item No.	Description of Item
1	*2*
	1C-2x2.5sqmm (BYM) cable with 2.5 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 25 mm having wall thickness of 1.5 mm
29	Concealed conduit wiring with following PVC insulated and sheathed stranded cable (BYM) & PVC insulated Green / White coloured ECC wire (BYA) through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet and pull box with 3mm thick ebonite sheet cover, fixing materials etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer.Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer. 1C-2x10sqmm (BYM) cable with 10 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 25 mm having wall thickness of 1.5 mm
30	Providing & fixing the chandelier light fitting of following manufacturers model & catalogue number suitable for use CFL / LED lamp, brass holder, cylindrical brass carrier suitable for use with earth terminal, necessary wiring with 2 x 0.4 sq.mm stranded PVC insulated flexible FR cable etc. complete (except lamp) as per sample accepted / approved by the Engineer.
31	**Air Cooled Water Chiller (VFD Driven) CH-01 & 02** Air Cooled Water Chiller complete with twin Screw Compressor with motor, Built-in starter panel with VFD, Air Cooled Condenser, insulated Evaporator, temperature and pressure indicator, microprocessor control panel, Flow switch, Standard safety devices, spring mounted vibration isolators, charged compressor oil and other accessories. The units Control Panel shall be factory wired and tested. The unit shall be complete with Safety and Control devices as specified in Technical Specifications: -Condenser material: Copper Coil with Aluminum Fins -Cooling capacity: 615 kW (175 Ton of Refrigeration) -Chilled water inlet/outlet Temp : 11.56 C / 6 C -Chilled water flow rate: 1589.7 l/min (420 US GPM) -Condenser air inlet temperature: 35 C -Fouling factor for Evaporator: 1.8x10-5 m2.0C/W -Minimum Number of Compressor: 2 -Min Number of Refrigerant Circuit with Gas Locking devices: 2 -IPLV rate: Min 4.5 -Capacity control: Stepless

Item No.	Description of Item
1	*2*
	-Guard for Condenser Fins -Refrigerant: R407C / R 134a / R410 or Environ friendly Refrigerant -Power input source : 400+/-10%V, 50 Hz, 3 Ph
32	**Chiller Plant Manager** It includes Chiller Manager for sequencing of 2 Chillers, 3 Primary Chilled Water Pumps, 3 Secondary Chilled Water pumps to maintain '- equal run time of Chillers. '- constant temperature at Chilled water supply Header '- automatic start of Standby unit in the event of duty unit failure The wotks includes sensors, controllers, BTU Meter, Motorised Solenoid Valves across Chillers, Control Transformer, etc. including Control cabling, conduiting, etc works.
33	**Chilled Water Fan Coil Units** Fan Coil Units shall be complete with EC (Electronically Commutated) fan with continuous operation type motor, cooling coil with Drain and Vent line, Coil drain & Vent port, Remote / Wired Thermostat with two way Solenoid valve and Fan controls (On, Off, High, Low, Medium or Stepless), Control Transformer (if required) , Air Filter, Vibration Isolator, etc complete. -All FCUs shall have built in/Separate Drain Pump. -Entering water temperature : 6 C -Leaving water temperature : 11.56 C -Entering air temperature : DB 25.24 C/WB 19.05 C -Leaving Air temperature : DB 13.5 C/WB13.22 C -Power input : 220+/-10%V, 50 Hz, 1 Ph
33.1	**Fan Coil Units (FCU CAS)-Ceiling Cassette type** Fresh Air Ports & Flexible Hose pipe: For Fresh Air inlet to Cassette type AC. Flexible pipe corresponding to Fresh air port dia shall be insulated with 15mm thickness PEF insulation pasted with self adhesive Aluminum Foil. Length 1m. -Remote Thermostat with Wall mounting bracket
33.1.1	Cooling capacity: 2.5 TR
33.1.2	Cooling capacity: 1 TR
33.2	**Fan Coil Units (FCU D)-Ducted Ceiling Hideaway** C/W Extended Drain Pan, duct collar, Return Air Plenum box with Pre-Filter, etc. Cooling capacity 5 Ton, ESP: 50 Pa
33.3	**Fresh Air Fan Coil Unit (Indoor Unit)** Cooling capacity : 4 TR; ESP: 150 Pa; Air Flow Rate : 600 CFM
34.0	**Centrifugal Pumps** Centrifugal type end suction vertical discharge pump complete with base plate, spacer coupled motor, safety cover etc. complete. Motor shall be heavy duty type rated for continuous operation with minimum 15% over rating from BkW. Pump efficiency shall not be less than 60%. Impeller speed shall not be more than 1500 RPM. Power input shall be : 400+/-10%V, 50 Hz, 3 Ph Water temperature: 5 C to 35 C Casing pressure: Min 1600 kPa

Item No.	Description of Item
1	*2*
	Accessories: Spring Mounted vibrating Isolator
34.1	**Primary Chilled Water Pumps (PCHWP- 01,02,03)** -Flow rate: 1589.7 l/min -Head: 30 m WG.
34.2	**Secondary Chilled Water Pumps (SCHWP-01, 02, 03)** Flow rate: 1589.7 l/min Head: 35 m WG
35.0	**Pipe accessories** All pipe accessories under this headings shall have withstanding capacity at 10 Kg/Sq. cm pressure. Pipe accessories of dia 50 mm and below shall be threaded end type with bronze/brass body. Pipe accessories above the 50 mm dia shall be of flanged end type.
35.1	**Butterfly Valve** Butterfly valve shall be made of cast iron body, high corrosion resistant bronze disc, liner, stainless steel stem, self locking mechanism, showing degree of opening by pointer and calibrated notch plate. having arrangement for flange connection with pipes.
35.1.1	Gear Operated, Dia 150mm
35.1.2	Gear Operated, Dia 100mm
35.2	**Globe valves** Globe Valves of above 50 mm dia shall have iron body, bolted bonnet, outside screw and yoke rising stem beveled wedge disc and flanged end type with companion flange, galvanized nut bolt and gasket. Valves of 50 mm dia and smaller shall have bronze body, screwed bonnet, rising stem, swivel disc, integral seat. Dia 150mm
35.3	**Check Valves (swing type)** -Flanged type Check valves shall have iron body, bolted cover, swivel type disc. -Threaded type check valve shall have bronze body, SS Spring, Resin Disc**.** Dia 150mm
35.4	**Y-Strainer** -Flanged type Y-strainer shall have bolted cover, stainless steel screw. -Threaded type Y-Strainer shall have Cast Brass body, SS Strainer**.**
35.4.1	Dia 150mm
35.4.2	Dia 32mm
35.4.3	Dia 25mm
35.4.4	Dia 20mm
35.5	**Flexible Pipe Joints** Flanged type Rubber Flexible joint shall be made of molded neoprene or butyl with Nylon Cord fabric lining. It shall be of single flex spherical shape with floating steel flange. -Screwed type Flexible joint shall be made of molded neoprene or butyl with Nylon Cord fabric lining. It shall be of single flex spherical shape with malleable iron / steel union.
35.5.1	Dia 150mm

Item No.	Description of Item
1	*2*
35.5.2	Dia 32mm
35.5.3	Dia 25mm
35.5.4	Dia 20mm
35.6	**Auto Vent Valves** Free floating type Automatic Vent Valve shall have test cock, 20 mm NB threaded outlet and inlet connection to accept drain line and Chilled water inlet connection. It must be located at the top level of all pipe work where there is possibility of Air trap. Require to show position in Shop drawing.
35.7	**Gate Valve** Gate valve shall be bronze/brass forged body construction.
35.7.1	Dia 32mm
35.7.2	Dia 25mm
35.7.3	Dia 20mm
35.8	**Pressure Relief Valve** Threaded type with bronze body. Dia 25mm
35.9	**Non Return Valve** Threaded type check valve shall have bronze body, SS Spring, Resin Disc. Dia 25mm
36.0	**Metering Devices**
36.1	**Pressure Gauge** 100 mm dia dial type Pressure Gauge shall be complete with pet cock, pressure snubber. Range shall be 0 to 10 Kg/sq. cm. -Type: Bourdon tube Dial type -Casing: Stainless Steel -Weather Proof, IP rating 65
36.2	**Pipe Thermometer** Industrial type direct reading Pipe Thermometer shall be complete with thermometer well. The stem length shall be 3/4th of corresponding pipe sizes. Range shall be 0 to 50 degC.
36.3	**Water Flow Balancing Valve** The contractor must have Water Flow Measuring instruments matching with the valve. Balancing Valve with ports for measuring Water flow rate.
36.3.1	Dia 150mm (Static Balancing) across each Chiller
36.3.2	Dia 100mm (Dynamic Balancing) at each floor
36.4	**2-Way motorized Valves** Butterfly valve c/w driving motor shall be made of cast iron body, high corrosion resistant bronze disc, liner, stainless steel stem, self locking lever with locking mechanism showing degree of opening by pointer and calibrated notch plate. having arrangement for flange connection with pipes. Dia 150mm
36.5	**Variable Frequency Drive (VFD)** AC Variable Frequency Drive of frequency converter type, complete

Item No.	Description of Item
1	*2*
	with Built-in RFI Filter, integrated thermal motor protection, protection against earthing and short circuiting, over current protection, menu based programming system with keypad input facility and LED display, 4-20mA analog output, 10V/24V internal voltage supplies, 0/4-20mA and 0-10v analog input, IP54 enclosure, 3 Phase/415 V 0-120 Hz output, 10V/24V internal voltage supplies, 0/4-20mA and 2-16 kHz variable switching frequency, Static pressure sensor, etc. kW ratings mentioned are approximate. Actual kW rating are to be taken from the fitted kW based on manufacturers software selection of concern equipment.
36.5.1	for PCHWP (Approx 12 kW)
36.5.2	for SCHWP (Approx 14 kW)
37.0	**Chemical Dosing Pot** Chemical Dosing Pot S.S 304 of 1.6mm thickness with followings: -Capacity: 15 liter -Water inlet SS Ball valve: dia 20mm -Water outlet SS Ball valve: dia 20mm -Drain port (SS Ball valve, dia 20mm) -Chemical inlet funnel with SS Ball Valve, dia 20mm
38.0	**Chilled Water Pump insulation with 25mm thick PEF Insulation**
39.0	**Fans**
39.1	**Axial Flow Fan ForVentilation** The details shall be as per Technical Specifications. The control of fan shall be based on signal received from fire alarm panel. The fan capacity shall be as follows: -General Data : -Maximum Fan RPM: 1450 -Maximum sound level: 70 dB at 1 m distance Each unit shall be complete with one set Smoke Detector and two sets of Motorized Damper for by pass control complete in all respect.
39.1.1	**SAF GF/03 For Generator Room Fresh air inlet Air flow rate : 16990 m3/hr; ESP: 100 Pa**
39.1.2	**SAF GF/01,02 For H.T. Panel, PFI, X-Former Room Fresh air inlet** Air flow rate : 5098 m3/hr; ESP: 100 Pa
39.2	**Propeller Type Fans** These exhaust fans shall be automatic sutter on one side an security grille on other side to prevent accidents. Power : 415V / 3Ph / 50 Hz
39.2.1	**EAF GF/01,02,03,04 (Exhaust Air)** Air flow rate: 5000 CFM
39.3	**Fans with Starter For Toilet exhaust** Type: Circular type with duct in line connection Air flow rate: 350 CFM; ESP: 100 Pa;
39.4	**Ceiling mounted Toilet Exhaust Fan with built-in Grille** It contains followings: -Fan body made of ABS Plastic -Round spigot opening for flexible connection

Item No.	Description of Item
1	*2*
	-Non-return flaf to prevent back flow -Balanced turbine fan with curved blade -Capacitor operated motor with Class E insulation -Spring clip on front cover for easily removable -ESP: 50 pa -Power supply: 220V, 1 ph, 50 Hz, -Sound rating: Max 40 dBA at 3 m -Air flow rate: 50 CFM
40.0	**Closed Type Expansion Tank with Auto Refil Pump** The closed type Expansion Tank shall be complete with Automatic Refil Unit based on system pressure requirement (2 to 3 Bar, adjustable). It is constructed of mild steel. The tank shall be painted. Accessories: -Auto Refil pump (pressure actuated with Pr. Sensor) -Isolating valve -Check valve -Pressure relief Valve -Air Purger -Starter Panel -Capacity: 1500 Liter The outside surface of the tank shall be insulated with 38mm. Thick of fire retardant type closed cell insulation. The tank shall be installed on R.C.C colum after proper clipping of the roof. All the accessories of the tank shall be properly cleaned, painted over the primer. The outer surface of the insulation shall be plastered with neat finish over G.I wire-mesh.
41.0	**Pre-insulated Pipe Pipe:** **Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 grade C Heavy duty** **Insulation:** Poly Urethene, density: 45 kg.m3 minimum, Insulation Thermal conductivity: 0.022 w/mK at 20 C mean temp. **Jacketing:** 0.5mm GP Sheet, spiral wound The works shall be complete with factory fabricated bends, tees, elbows, reducers, socket, union, nipple, flange, etc. as per requirement, drawing and direction. Pipe work shall be complete with pipe hangers, supports, vibration isolator brackets, etc. .
41.1	Dia 200 mm (thick 50mm)
41.2	Dia 150 mm (thick 38mm)
41.3	Dia 100 mm (thick 38mm)
41.4	Dia 80 mm (thick 38mm)
41.5	Dia 65 mm (thick 38mm)
41.6	Dia 50 mm (thick 38mm)
41.7	Dia 40 mm (thick 38mm)
41.8	Dia 32 mm (thick 38mm)
41.9	Dia 25 mm (thick 32mm)
41.10	Dia 20 mm (thick 32mm)
42.0	**Chilled Water Pipe Insulation (Joining between Preinsulated pipe**

Item No.	Description of Item
1	*2*
	or in case of shortage of imported items) Chilled Water Pipe Insulation with Poly Urethene and Jacketing with GP Sheet of 26 SWG.
42.1	Dia 200 mm (thick 50mm)
42.2	Dia 150 mm (thick 38mm)
42.3	Dia 100 mm (thick 38mm)
42.4	Dia 80 mm (thick 38mm)
42.5	Dia 65 mm (thick 38mm)
42.6	Dia 50 mm (thick 38mm)
42.7	Dia 40 mm (thick 38mm)
42.8	Dia 32 mm (thick 38mm)
42.9	Dia 25 mm (thick 32mm)
42.10	Dia 20 mm (thick 32mm)
43.0	**Duct Work (Pre-insulated)** Supply, fabrication and installation of galvanized sheet steel duct work complete with bends, Tees, reducers, branch takeoffs, air chamber etc. as per direction and drawing. Hangers, brackets, stiffeners and isolator boxes shall be fabricated with M.S. angle/F.I. bar or rod as per drawing and direction and shall be galvanized. Duct shall be constructed with best-bloomed galvanized sheet steel. Before installation of duct, inside and outside shall be cleaned from any dust. Between flanges, for flanged end duct, approved type of gasket shall be used. Approved type of sealing compound shall be used to make the duct work leak-proof. Duct shall be hanged or supported at an interval of not more than 1.8 meter.
43.1	**Duct made of 24 SWG sheet** Pre-insulated ducts up to 300 mm width shall be fabricated with 0.70 mm (24 BWG) thick sheet steel and drive S-slip joint shall be used and fixing of duct insulation of required thick glass wool with K value of not more than 0.027 Kcal/hr./sqm/0C/mm at 200C. Insulation shall be complete with reinforced aluminum foil vapor barrier, adhesive, aluminum tape, fixing pin @ 250 mm c/c.
43.2	**Duct made of 22 SWG sheet** Pre-insulated and pre-cleaned duct having larger size from 300 mm to 1050 mm width shall be fabricated with 0.85 mm (22 BWG) thick sheet steel and shall be provided with companion flanged joint reinforced with 25 x 25 x 3 mm M.S. angle and fixing of duct insulation of required thick glass wool with K value of not more than 0.027 Kcal / hr / sqm / 0C / mm at 20oC. Insulation shall be complete with reinforced aluminum foil vapor barrier, adhesive, aluminum tape, fixing pin @ 250 mm c/c.
44.0	**Duct Acoustic Lining** Duct accoustic lining made of nitrile rubber base with open elastomeric foam, specially prepared for duct accoustic. Lining shall have peelable self adhesive tape for fixing with duct. -Operating temperature: -20 C to 85 C -Thermal Conductivity: Max 0.047 W/mK @ 20 C -Fire: Class 1

Item No.	Description of Item
1	*2*
	-Density: Min 140 kg/m3 -Tensile Strength: Minimum 100kPa -Thickness: 15mm
45.0	**Air Terminals** Air terminals shall be constructed with extruded aluminum with powder coating finishing. Thickness shall be not less than 18 SWG.
45.1	**4-way Supply Air diffuser** c/w Opposed blade type neck damper. Dmaper shall have worm gear for operating from roomside.
45.2	**Jet diffuser** Dia 250 mm dia
45.3	**Return Air Grille** (Egg Crate type)
45.4	**Fresh Air Louver/ Exhaust Air Louver c/w G4 washable filter** - with neck Damper made of Aluminum
46.0	**Duct Flexible Joint with FCU/Fan** Duct connected with Fan Coil Units, Air Handling Units, Fans, etc. shall be done with Nylex or equivalent Flexible connection. Width shall be maximum 150 mm. Duct must be in lined with corresponding equipment opening.
47.0	**Pipe Accessories Insulations** All Chilled water pipe accessories such as Valves, Strainers, shall have to be insulated with loose glass wool with adhesive cement. Two layers of 0.1 mm thick polythene sheet wrapping with 0.8mm dia copper wire, markin cloth and thereafter painted with synthetic enamel paint.
48.0	**Dampers**
48.1	**Volume Control Dampers** Supply & installation of volume control damper constructed with 18 BWG sheet steel painted with 2 coats of synthetic black paint, adjustable locking arrangement from outside of duct and suitable to mount on flanged end duct as per drawings and direction of the Engineer (local made) .
48.2	**Fire Damper** Fire Damper shall be constructed according to NFPA 90A. Free X-section area shall be at least 85% of face area. It shall be constructed with Pre-galvanized steel. All moving parts shall be constructed with Stainless steel to prevent seizure. Fire Damper should be with extended sleeve. Withstanding pressure: 2000 pa minimum. Fire rating: min 3 hour Neck Size: 450x300mm
49.0	**Secondary Drain Pan** -Made of 0.6mm thick SS Sheet -Insulation: PU 25mm thick -Tray size: 800mm x 400mm x 40mm -Accessories: drain port with hose
50.0	**Electrical Works**
50.1	**Air Conditioning Distribution Board (ADDB)** Electrical power distribution board shall be constructed with steel sheet painted with epoxy paint and shall house MCCBs, MCBs, Busbars, Starters, Overload protector for motors, etc. All MCCBs, MCBs, shall be of brand DORMAN SMITH / SIEMENS /ABB/Schneider or equivalent.

Item No.	Description of Item
1	*2*
	Front panel shall be with Voltmeter, Ampere meter, phase indicators, Start stop button, internal wiring, etc. Other details shall be as per drawing and corresponding technical Specifications. -kW rating mentioned in drawing are approximate. Bidders must have to consider components sizing based on kW rating of their selected equipment. -Incoming circuit breaker shall have tripping provision receiving signal from FACP. -Details shall be as per Schematic drawings
50.1.1	ACDB for GF/01
50.1.2	ACDB GF/02 for Chiller Plant Room
50.1.3	ACDB for GF/03
50.1.4	ACDB for GF/04
50.1.5	ACDB for 1F/01
50.1.6	ACDB for 2F/01
50.1.7	ACDB for 3F/01
50.2	**Electrical Cable Works**
	PVC insulated PVC sheathed copper conductor single / multicore cable complete with PVC conduit, Tray / Ladder and copper conductor (ECC). Conduit works shall be complete with Bends, Tees, Junction box, etc. The others details shall be as per Technical Specifications and drawing. kW rating mentioned here are approximate. Bidders must have to consider cable sizing based on kW rating of their selected equipment.
50.2.1	**For Chiller** NYY 3x1cx400 rm+ BYA 1cx240 sm ECC
50.2.2	**For Chilled Water Pumps** NYY 6x1cx10 rm+ BYA 1cx10 rm ECC
50.2.3	**For Fan Coil Units / Fans (Three Phase)** NYY 3x1c-2.5rm + BYA 1cx1.5 rm
50.2.4	**For Fan Coil Units / Fans (single Phase)** NYY 2x1c-2.5rm + BYA 1cx1.5 rm
50.2.5	**Control Cable** For Thermostat wiring including Conduit works
51.0	**External Duct/Pipe Jacketing** Jacketing shall be done with 24 SWG Aluminum sheet. Weather proof sealant to be used at all joining places.
52.0	**Condensat drain piping** Made of PVC Water grade pipe with 15mm thick Aluminum Foil pasted PE Insulation. The pipe works includes Elbow, Tee, Reducer, Socket, Nipple, Endcap, Deadplug, Hanger, support, etc.
52.1	Dia 20mm
52.2	Dia 25mm
52.3	Dia 32mm
52.4	Dia 40mm
52.5	Dia 50mm
53.0	**Split type Air conditioners** Split Air

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	conditioners shall be composed of one outdoor Condensing unit and one Indoor Fan Coil Unit. The Condensing unit shall be consisted of compressor(s), Air Cooled condenser, Condenser Fan, etc. The Indoor Fan Coil units are consisted of evaporator coils with fans, etc. These units shall be factory assembled, internally wired, fully refrigerant charged condensing unit, tested under strict quality standards. The Condensing unit shall be suitable for outdoor installation. Capacity be as per following schedule. The cost includes Refrigerant piping between outdoor unit to Indoor units, drain piping, Power cabling from ACDB and control Cabling between Room Thermostat & Indoor units. -Entering air temp to FCU: 25 C DB / 18 C WB -Entering air temp to Condenser: 36 C DB / 27.5 C WB -Accessories: Wall mounted Room Thermostat
53.1	**With Wall mounted Decorative Fan Coil Unit, OU GF/01** Cooling capacity: 2 TR Evaporator / FCU Air Flow rate: 600 M3/hr Minimum
54.0	**Shop drawing and Documentation** Preparation of detail Shop drawing including, layout drawing, section details, schematic drawing, etc. Get approval of shop drawing before any fabrication or installation works. Shop drawing must be coordinated with other services likely Electrical cabling, Light Fixtures, False Ceiling and Interior design. The work also includes: a). Show actual dimension & weight of Equipment. b). Show actual kW, LRA, RLA, No of Phase, Circuit Breaker ratings, etc. rating of all equipment. c). Reconfirm Electrical cable sizing. d). Reconfirm Ampere ratings of AC Panels components. e).Submit Electrical connection diagram of AC Panels. f). Submit General arrangement of AC Panels. g). Submit Plinth drawing for all equipments supports with operating weight. h). show union, socket,nipple, reducer, end plug, dead cocks, etc. in piping drawings. i). Submit Electrical and P&I Diagram of Chilling unit. j). Show input requirement from Client in red colour. k). Bottom level for all duct, pipe, Equipment, Cable Tray, etc. from Finished Floor Level. l). Submit advance copy of Installation, Operation and maintenance manuals of all equipment. Contractor should prepare this drawing at site coordinating with other services. Drawing submission in suitable paper size with minimum 1:50 scale. Soft copy AutoCAD to be furnished with hard copy. In case of any conflict between Design drawing and Shop drawing, information in the Design drawing will predominate unless recommended by the Consultant.
55.0	**Tagging and Identification** Tagging and identification of equipments, Pipings, Cablings, etc. as per recommendation of the Consultant.
56.0	**As-Built drawing** Preparation and submission of As-built drawing in following forms: One set in tracing paper, size A1 Two sets print out in A1 Paper Soft Copy in CD in AutoCAD Version 2020

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	Soft Copy in PDF Version
57.0	**Testing, Commissioning and Balancing** After proper installation and certification the system shall be tested, commissioned and balanced as per direction and recommendation by the Manufacturer as well as HVAC Designer. Contractor shall do (but not limited to) following works under this clause. - Prepare and submit Commissioning protocol and get approval from Consultant. - Carry out duct inspection for FCUs and Fans - Carry out pipe pressure testing and inspection - Carry our Electrical Cabling testing and inspection - Pipe flushing and charging of Treated Water - Chemical cleaning of rust, etc. - Testing of condensate water drainage slope with water - Testing of FCUs, Fans with Air and Water Balancing. - Testing and Balancing of Pumps with Chilled water - Cleaning of Y Strainers - Commissioning of Chillers, VRF, etc. - Safety protection and cutouts shall be tested individually - Commissioning of Automatic Control system - Balancing of Air flow rate, Temperature - Functioning test of Multi Chiller Control, Compressor sequencing and Pump control system All testing and commissioning works must be documented in approved formats. All of these documents must be jointly witnessed and signed by the Client and Contractors authorized Engineer.
58.0	**Documentation** Compiling Documents with followings Name plate data of all equipments Recommended list of Spare parts. Submission of Operational and Maintenance manual for Chillers, Pumps, etc. Submission of Control schematic drawing, operation procedure and maintenance - trouble shooting manuals for Automatic Control systems. Compiling of certified Testing and Commissioning Documents. Compiling of certified As-built drawings. Preparation of periodic servicing and maintenance schedule. etc.
59.0	**Operation and maintenance (8 hr/day basis)** Thorough maintenance, servicing, operation and minor repairing including necessary replacement of defective minor spare parts (departmentally supplied) if any, as per detailed daily, weekly, monthly, half yearly and yearly as per following work schedule for smooth functioning of the following capacity air-conditioning & ventilation system as per standard Engineer practice and maintenance manual of the manufacturer and direction of the Engineer. Log book for one hourly record shall be maintained by the Contractor and shall be submitted to the Owner in every week**.**
60.0	**FIRE PUMP :** Pump for fire fighting system shall be complete with mounting, coupled drive,

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	controller etc. Pump shall be operated on pressure signal from pressure switch with all controls and accessories as per pump detail drawing. The works includes cabling from Pump controllers to Pumps, control cabling, Pressure transmission piping, etc. Bidder must submit Software selection for all Pumps complying Water flow rate and head.
60.1	**Diesel Engine Driven Fire Pump (FP 01)** Engine driven fire pump shall be complete with direct coupled 4 stroke diesel engine, pump, all controls and accessories, diesel tank etc. as per specification and drawing. Pump type: Turbine type Water Flow rate: 1000 US GPM, Pump Head: 9 BAR Pump Efficiency: minimum 60%, Pump RPM: 2900 Pump casing: Cast Iron, Test pressure: Min 18 Bar Pump Impeller: Bronze, Pump shaft: Alloy steel Pump water seal: Gland packing, Pump set shall have following accessories: Engine Capacity: 20% over then break horse power Engine over speed shutdown device Engine Tachometer: Engine oil pressure gauge Engine Battery & Charger Engine Aspiration: Turbo charged, Fuel Connection, Fire resistance Flexible Supply & Return, Fuel Tank with fuel system and direct reading fuel gauge, 5-8 Stages impeller Automatic air release valve: - 90mm dia Suction gauge range 30"-0-150 psi - 90mm dia Discharge gauge range 0-300 psi - Float - operated air release valve - Flexible coupling - Coupling guard - Pressure relief valve with enclosed Waste cone - Concentric reducer All accessories of pressure sensing line Other accessories shall be NFPA 20 compliant Work also includes: Chimney for Diesel Engine Pump Controller Exhaust ducting, louver, insect proof netting **Listed: UL/ULC/EN/VDS/JIS**
60.2	**Electric Motor Driven Fire Pump (FP 01)** Electrical driven fire pump shall be complete with motor, starter, base plate, coupling, all other accessories etc. as per specification and drawing. Pump type: Turbine type Water Flow rate: 1000 US GPM, Pump Head: 9 BAR Pump Efficiency: min 60%, Service Factor for Motor: 1.20 Pump RPM: 2900 Pump casing: Cast Iron, Test pressure: Min 18 Bar Pump Impeller: Bronze, Pump shaft: Alloy steel Pump water seal: Gland packing, Pump set shall have following accessories: Suction & Discharge gauge, 5-8 Stages impeller Automatic air release valve: - 90mm dia Suction gauge range 30"-0-150 psi - 90mm dia Discharge gauge range 0-300 psi - Float - operated air release valve - Flexible coupling - Coupling guard - Pressure relief valve with Waste cone - Concentric reducer All accessories of pressure sensing line Pump Controller Other accessories shall be NFPA 20 compliant **Listed: UL/ULC/EN/VDS/JIS**

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60.3	**Jockey Pump (JP 01)** Jockey pump shall vertical type complete with pump, pump motor, pressure switches all other standard accessories as per specification. Water Flow rate: 50 US GPM, Pump Head: 9.5 BAR Type : Multi-stage vertical turbine, Efficiency: 60% minimum, Supply: 380V/50Hz/3Ph voltage supply, Motor: RPM TEFC sq.cage, Service factor 1.2, NFPA-20 compliant. - with Fitting: 20mm Casing relief valve - with gauges for suction and discharge **Pump Controller shall be UL/ULC/EN/VDS Listed**
61.0	**VALVES & FITTINGS GATE VALVE :** Valve & fittings complies with ANSI, flange / groove type, temperature range: 0°C-80°C; working pressure: 200 PSI minimum, valve body as per ASTM A536, 65-12 standard, UL / FM approved. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.
61.1	**O. S & Y GATE VALVE**
	a) 150mm dia (2 Nos valve with supervisory switch)
	b) 50mm dia
61.2	**RESILIENT SWING CHECK VALVE**
	a) 150mm dia
	b) 50mm dia
61.3	**FOOT VALVE WITH STRAINER**
	50 mm dia.
61.4	**FLEXIBLE JOINT :** Supply & installation of flexible joint complies with ANSI, temperature range: 00C-800C; working pressure: 200 PSI minimum, valve body as per ASTM A536, 65-45-12 standard, UL / FM approved.
	a) 150mm dia
	b) 50mm dia **Listed: UL/ULC/EN/VDS/JIS**
61.5	**BALL VALVE class: PN20, UL / FM approved**
61.5.1	a) 25mm dia
61.5.2	b) 20mm dia
61.6	**PRESSURE GAUGE: UL listed / FM approved** Supply and installation of 3.5'' - 4" dial type pressure gauges including supply of all accessories and consumable. The range shall be 0-250 psi. UL/FM approved. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.
61.7	**AUTO AIR-VENT VALVE:** Auto air vent valve of 1 inch dia of 1 inch (25mm) inlet BSP, bronze made with rubber ball & seat. The valve shall be suitable to release air from the fire hydrant pipes. Shall be suitable to withstanding pressure up to 10kg/cm2. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.
61.8	**WATER FLOW METER:** 150mm dia **Listed: UL/ULC/EN/VDS/JIS**

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62.0	**SPRINKLER HEAD :** Sprinkler head of 1/2" in diameter nominal orifice, K-Factor 5.6 chrome finish glass bulb type. Temperature rating 680 C for general area others area shall be specified as per requirement. Sprinkler head shall be UL Listed / FM Approved Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.
62.1	Pendent sprinkler
62.2	Up-right sprinkler
63.0	**SPRINKLER ALARM CHECK VALVE** The valve shall be actuated breaking of sprinkler glass bulb. The valve shall be UL listed / FM approved. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally. dia 150mm
64.0	**ZONE CONTROLN VALVE:** Zone control valve to get the notification of water flow from any fire zone on a combination of butterfly valve with tamper switch, flow switch, pressure gauge and test & drain valve. UL listed / FM approved. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.
64.1	dia 100 mm
64.2	dia 80 mm
64.3	dia 65 mm
64.4	**SIGHT GLASS:** For dia 25mm
65.0	**FIRE BRIGADE CONNECTION:** Fire brigade connection: 4- way Supply and installation of 4 - way fire brigade connection complete in all respect with all accessories. The unit shall have two Inlet connections of 2½" (63mm) male instantaneous with non-return valve and having 6" dia. (150mm) flanged type outlet directly connected with stand pipe. It will have also one 25mm dia. drain valve for drainage of water, rubber blank cap and chain for protection. Outlet 150mm dia. shall be as per ANSI-B-16B-16.5B. Shall be suitable to withstand pressure of 20kg/cm^2. Shall be manufactured according to BS standard & suitable for using with fire service & civil defense department of BANGLADESH. Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.
66.0	**FIRE HYDRANT UNIT (40mm dia):** Each 1½" (40mm) dia Fire Hydrant Unit shall be complete with the following Components and accessories.
66.1	**Hose Angle Valve (Landing valve): 40mm dia** Hose Angle valve / Landing valve of 1½" (40mm) shall be made with brass / bronze with instantaneous female outlet. The valve shall be UL Listed /FM approved and working pressure shall not be less than 10kg/cm^2. Inlet shall be threaded end type, shall be installed inside the hydrant cabinet. Country of origin: USA / European countries / SOUTH KOREA / MALAYSIA / TAIWAN or their licensed manufacturing

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	units located globally.
66.2	**Fire Hose : 40mm dia** Fire Hose of 40mm dia 30 meter long suitable to install inside the Hydrant cabinet. The hose shall confirming to BS 6391 . The Hose shall be UL Listed /FM approved & Burst Pressure shall be not less that 600 psi and working pressure 200 psi, shall be made with special quality EPDM rubber as internal lining, suitable to withstand heat and polluted water, heat and abrasion resistance, Jacketing shall be made up of 100% polyester for extra strength. Hose shall be 30meter long in a single length and shall be with male coupling in one end other end with female coupling. Couplings shall be banded with hose with copper wire properly. Instantaneous couplings shall be made with bronze / aluminium alloy, polished / hard anodized to confirm BS 336. Country of origin: USA / European countries / SOUTH KOREA / MALAYSIA / TAIWAN or their licensed manufacturing units located globally.
66.3	**Jet / Spray Nozzle : 40mm dia** Jet / Spray Nozzle having 40mm dia male instantaneous coupling. The Nozzle shall be operable in three modes: Jet - Spray - Shut off. The Nozzle shall be light weight and easy operable. Construction of the Nozzle shall be of Brass or Alluminium & Nylon. Working pressure shall be not less than 7Kg / Cm^2. Flow shall be not less than 100 lpm @ 7kg / cm^2. Nozzle shall be install inside the cabinet. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.
67.0	**FIRE HYDRANT UNIT (65mm dia):** Each 65mm dia Fire Hydrant Unit shall be complete with the following Components and accessories.
67.1	**Hose Angle Valve (Landing valve): 65mm dia** Hose Angle valve / Landing valve of 65mm shall be made with brass / bronze with instantaneous female outlet. The valve shall be UL Listed /FM Approved and working pressure shall not be less than 10kg/cm^2. Inlet shall be threaded end type, shall be installed inside the hydrant cabinet. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.
68.0	**PILLAR HYDRANT :** Pillar Hydrant : Double Headed Cast Iron body Double Headed Pillar Hydrant complete with Two (02) nos. cast brass made controllable outlet of 65mm dia with female instantaneous outlet, Inlet shall be 100mm dia flanged end. The Hydrant shall be suitable to withstand test pressure of 300 psi (min). Color of the unit shall be red / approved by the manufacturer or as per code. Pillar hydrant shall be BS standard. Country of origin: MALAYSIA / SOUTH KOREA / TAIWAN / USA / European countries or their licensed manufacturing units located globally.
69.0	**STEEL CABINET:** Hydrant cabinet of suitable size (as per site measurement and requirement / Recommendation of Engineering in Charge) to accommodate Landing valve, Hose, Nozzle

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	and coupling. The cabinet shall be with swing type door with breakable tempered glass. The Cabinet shall be made with 16 SWG sheet steel, Powder coated of red color. Country of origin: Locally fabricated
69.1	Class- III cabinet (for 65mm dia hose rack assembly)
69.2	Outdoor hydrant box for pillar hydrant
70.0	**BLACK STEEL PIPE ERW, 40 SCHEDULE:** Black steel pipe ASTM A53 ERW, 40 schedule. The pipe work shall be include with welded type tee, elbow, reducer etc. and also hangers / supports etc. completed. Pipe work (over ground) shall be painted with red oxide primer. Underground pipe should be laid after wrapping with PVC tape after using approved prior. pipe wall thickness shall be as per mention for different diameters. Country of origin: AUSTRALIA / CHINA / INDIA. / JAPAN / SOUTH KOREA / VIETNAM.
70.1	200mm (8 inch) dia. Wall thickness: 8.2mm
70.2	150mm (6 inch) dia. Wall thickness: 7.1mm
70.3	100mm (4 inch) dia. Wall thickness: 6.0mm
70.4	80mm (3 inch) dia. Wall thickness: 5.5mm
70.5	65mm (2½ inch) dia. Wall thickness: 5.2mm
70.6	50mm (2 inch) dia. Wall thickness: 3.9mm
70.7	40mm (1½ inch) dia. Wall thickness: 3.7mm
70.8	32mm (1.25 inch) dia. Wall thickness: 3.6mm
70.9	25mm (1 inch) dia. Wall thickness: 3.4mm
70.10	20mm (3/4 inch) dia. Wall thickness: 2.9mm
70.11	12mm (1/2 inch) dia. Wall thickness: 2.8mm
71.0	**FIRE RATED DOOR:** Fire Door Minimum 2 hours fire rated & controlled by Fire alarm control panel, Fire door size shall be as per Architectural drawing. The Fire Door shall have following features: Leaf Configurations: As per Architectural drawing Door & panel: minimum 48mm thick Door frame: Pressed metal Door metal: Steel Visions panel for fire door using clear rated glass Kick panels of stainless steel to selected height Door C/W Smoke seals, viewing lens, electric strike & locks, panic bars, Magnetic Door Holder, magnetic hold open devices. **Listed: UL/ULC/EN/VDS/JIS**
72.0	**FIRE EXTINGUISHER**
72.1	**Dry chemical powder type:** Supply & fixing the following capacities multi purpose ABC dry chemical powder stored pressure type with manometer system fire Extinguisher suitable for repeated use complete with wall bracket, CO2 Cartridge, easy refilling system etc. as per sample accepted/approved by the Engineer. Monoamonium phosphate based 40% ABC dry chemical agent & has moisture- proof, anti- caking properties. working pressure: 12 BAR minimum. proper fire rating (as per NFPA 10) according to the capacity of the extinguisher. Manufacturer certificate shall have to be submitted if needed. Also

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	sample of the dry chemical power will be tested by the proper authority in BANGLADESH if needed. Country of origin : CHINA / MALAYSIA or equivalent
72.1.1	6 Kg. capacity.
72.2	**Carbon- Di- Oxide type:** Supply & fixing the following capacities Carbon-di-Oxide type fire extinguisher suitable for repeated use complete with wall bracket, discharge nozzle etc. As per sample accepted/approved by the Engineer. Country of origin: CHINA / MALAYSIA or equivalent product.
	5 Kg. capacity
72.3	**Automatic Modular type Ceiling mounted Fire Extinguisher (Clean Agent)** The Clean agent extinguishing concentration for normal Class A combustibles is approximately 5.8 - 7% by volume. The minimum design concentration for total flood. Applications should be in accordance with NFPA 2001. Modular cylinders furnished with ceiling mounting brackets are of carbon steel. Material ,factory argon/CO2 weld, sand blasted, white finished, oven baked and coated with electrostatic powder. The extinguisher complete with, clean agent gas, cylinder, nozzle etc Temperature rating 68 degree centigrade Agent weight 6 kg **Listed: UL/ULC/EN/VDS/JIS/LPCB**
72.4	**Automatic Modular type Ceiling mounted Fire Extinguisher (Foam Type)** Automatic Foam Extinguisher (AFFF- Aqueous Film Forming Foam) works by firstly applying a fila forming foam (bubbles) to the fire which causes a blanket over the fire, suffocating the fire, while almost simultaneously cooling the fire Capacity- 6 Liter Total Weight- 10.56 Kg Cylinder Height- 162mm Cylinder Diameter- 280mm Duration of Discharge- 25 to 30 Second Extinguisher Agent- AFFF Propelling Agent- N2 Working Pressure- 12 to 15 Bar Testing Pressure- 30 Bar Storage Temperature- 5°C to 60°C
72.5	**Wet Chemical Type Fire Extinguisher** The 'chemical' element of wet chemical fire extinguishers is potassium. Potassium salts are sprayed out as a fine mist (gently, so as not to spread the burning oil or fat), and these react to create a soapy film on the surface of the substance on fire. Fire Extinguisher suitable for repeated use complete wall bracket, discharge valve, hose pipe, easy refilling system etc. as per sample approved by the Engineer-in -charge. Capacity 6 kg
73.0	**ELECTRICAL WORKS**
73.1	**Fire System Distribution Board (FSDB)** Providing & fixing 415V/250V, 50 Hz grade following concealed or surface type Distribution Board (DB)/Sub Distribution Board (SDB) made of 18-SWG MS sheet complete with hinged type door, built-in type locking arrangement, following capacity bus-bar with required no. of holes thereon on insulators at both ends, copper blocks for neutral and earth terminal, SP MCBs / TP MCBs/ TP MCCBs manufactured and

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	tested in accordance with relevant IEC/VDE/NEMA/BS/JIS standard having following breaking capacity with thermal over current and instantaneous electromagnetic short ckt. release, necessary arrangement for fixing of above CBs including stove enamel/gray hammer painting of board etc **Incoming** 250 Amps TP MCCB (36 kA) with following accessories: **Busbars** 300 amps TPN +E, copper busbars with color coded heat shrinkable insulation sleeve. **Outgoings** 1 No. 250A, TP MCCB (36 kA) 1 No.16A, TP MCB (6 kA) 1 No. 20A, SP MCB (6 kA) 1 No. 16A, SP MCB (6 kA) 1 No.16A, TP MCB (6 kA) Spare
73.2	**Electrical Cabling (through PVC conduit), Fire Rated** Surface conduit wiring with the following PVC insulated and sheathed stranded cable (NYY) / XLPE insulated and PVC sheathed stranded cable (2XY) & PVC insulated Green / White colour ECC wire (BYA) through PVC conduit of reputed manufacturer complete with fixing materials, other accessories etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards.
73.2.1	**FSDB to Pumps Controller FSDB to Pumps Controller (Electric Pump)** 1C-4x95sqmm (NYY) with 50 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 75 mm having wall thickness of 3 mm
73.2.2	**FSDB to Pumps Controller (Jockey Pump)** 1C-4x4 sqmm (NYY) (FR) with 4 sqmm (BYA) (FR) ECC wire through PVC pipe of minimum inner dia. 30 mm having wall thickness of 1.5 mm
73.2.3	**FSDB to Pumps Controller (For Diesel Pump)** 1C-2x4 sqmm (FR) cable with 4 sqmm (FR) ECC wire through PVC pipe of minimum inner dia. 25 mm having wall thickness of 1.5 mm
74.0	**SHOP DRAWING:** Preparation of detail Shop drawing including, layout drawing, section details, schematic drawing, etc coordinating with different installations of existing factory. Get approval of shop drawing before any fabrication or installation works. The work also includes: a) Show actual dimension of Equipment b) Submit actual kW rating of all equipment c) Reconfirm Electrical cable sizing d) Reconfirm Ampere ratings of electric components e) Submit Electrical conn diagram of Electric Panels f) Submit General arrangement of Electric Panels g) Submit Plinth drawing for equipment and Pipe supports
75.0	**AS-BUILT DRAWING** Preparation and submission of As-built drawing in following forms: One set in tracing paper, size A1 Two sets print out in A1 Paper Soft Copy in CD in AutoCAD Version 2010 Soft Copy in PDF Version
76.0	**TAGGING, IDENTIFICATION & SIGNAGED INDICATION:**

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	As per NFPA Code
77.0	**TESTING, COMMISSIONING AND BALANCING** The system shall be tested, commissioned and balanced as per direction and recommendation. Pipe work shall be tested at a test pressure of 15 kg/cm^2 for 24 hours without any leak. After proper testing, commissioning and balancing the system shall run for seven days up to the satisfaction of the Owner. Submit advance copy of Installation, Operation and maintenance manuals. The work includes training to the Owner's representative at site
78.0	**IRE ALARM CONTROL PANEL:** Addressable type Fire Alarm Control Panel complete with following basic options. Master Controller Assembly / CPU shall be suitable with port to add Voice alarm system / Fire Fighter Telephone system / Printer / Remote Annunciator etc. FACP must be comply with internationally accepted standard. Control units for Fire -Protective Signaling Systems" Addressable Fire Alarm Control Panel shall be complete, non-coded, Addressable, microprocessor based with initiating devices, notification appliances, and monitoring and control devices. Annunciation: Operation of alarm and supervisory initiating devices shall be annunciated at the FACP indicating the location and type of device. Monitoring: FACP shall individually monitor sensors for calibration, sensitivity, and alarm condition, and shall individually adjust for sensitivity. The control unit shall determine the condition of each sensor by comparing the sensor value to the stored values. Environmental Compensation: The FACP shall maintain a moving average of the sensor's smoke chamber value to automatically compensate for dust, dirt, and other conditions that could affect detection operations. Programmable Sensitivity : Photoelectric Smoke Sensors shall have various sensitivity levels ranging from (±) 0.2% up to 3.7%, programmed and monitored from the FACP. Sensitivity Testing Reports: The FACP shall provide sensor reports that meet NFPA /internationally accepted standard calibrated test method requirements. The reports shall be viewed on a CRT Display or printed for annual recording and logging of the calibration maintenance schedule. The FACP shall automatically indicate when an individual sensor needs cleaning. The system shall provide a means to indicate that a sensor requires cleaning. When a sensor's average value reaches a predetermined value, (3) progressive levels of reporting are provided. The first level shall indicate that a sensor is close to a trouble reporting condition and will be indicated on the FACP as "ALMOST DIRTY." This condition provides a means to alert maintenance staff of a dirty sensor without creating a trouble in the system. If this indicator is ignored, a second level "DIRTY SENSOR" condition shall be indicated at the FACP and subsequently a system trouble is reported [to the Central Monitoring Station]. The sensor base LED shall glow steady giving a visible indication at the sensor location. The "DIRTY SENSOR" condition shall not affect the sensitivity level required to alarm the sensor. If a

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	"DIRTY SENSOR" is left unattended, and its average value increases to a third predetermined value, an "EXCESSIVELY DIRTY SENSOR" trouble condition shall be indicated at the control unit. The FACP shall continuously perform an automatic self-test on each sensor which will check sensor electronics and ensure the accuracy of the values being transmitted. Any sensor that fails this test shall indicate a "SELF TEST ABNORMAL" trouble condition. Options at FACP : The control panel operator shall be able to make announcements via the push-to-talk paging microphone over the pre-selected speakers. Soft touch keypad, LED indications, LCD Display. Facility for total building paging shall be accomplished by the means of an "All Call" switch. Firefighter's phone (Optional) : Provide a supervised, two-way communication system between the Command Center/main fire alarm control panel and emergency phones. The firefighter's phone system shall be capable of handling single or simultaneous conversations with all phones connected into the system. As many as seven (7) phones shall be able to be connected into the active conversation. The phone system circuits shall be designed to prevent static, hum or other interference for clear, intelligible two-way conversation among all phones of the system. The phone system circuits shall be supervised, such that the FACP shall be able to differentiate between whether a handset has been plugged into the emergency phone jack or whether the circuit has a shorted wire. A beeping busy signal shall indicate to the person attempting to use a remote phone that the signal is being received at the control unit and that the lines are intact.The act of plugging a handset into an emergency phone jack or removal of any phone from its normal hook position shall cause an audible and visual indication at the control unit. Picking up the master phone and acknowledgment of the phone circuit shall silence the tone and allow for direct two-way communications.The act of unplugging handsets in use and replacement of remote phones will return the phone circuits to their normal supervisory functions.The FACP shall be provided with sufficient battery capacity to operate the entire system upon loss of normal AC power in a normal supervisory mode for a period of 24 hours with 5 minutes of alarm operation at the end of this period. The system shall automatically transfer to battery standby upon power failure. All battery charging and recharging operations shall be automatic.Battery: Sealed lead-acid. Provide sufficient capacity to operate the complete alarm system in normal or supervisory (non-alarm) mode for a period of 24 hours. Following this period of operation on battery power, the battery shall have sufficient capacity to operate all components of the system, including all alarm indicating devices in alarm or supervisory mode for a period of 5 minutes. Power Supply (Input Power) shall be 240VAC. All circuits requiring system-operating power shall be 24 VDC and shall be individually fused at the control unit.The incoming power to the system shall be supervised so that any power failure will be indicated at the control unit. A green "power on" LED shall be displayed continuously while incoming power is present.The system batteries shall be

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	supervised so that a low battery or depleted battery condition or disconnection of the battery shall be indicated at the control unit and displayed for the specific fault type. The system shall support 100% of addressable devices in alarm or operated at the same time, under both primary(AC) and secondary (battery) power conditions.Loss of primary power shall sound a trouble signal at the FACP. FACP shall indicate when the system is operating on an alternate power supply.Product data sheets for system components highlighted to indicate the specific products, features, or functions required to meet this specification. Alternate or as-equal products submitted under this contract must provide a detailed line-by-line comparison of how the submitted product meets, exceeds, or does not comply with this specification.Wiring diagrams, Shop drawings showing system details including location of FACP, all devices, circuiting and details of graphic annunciator.System Power and battery charts with performance graphs and voltage drop calculations to assure that the system will operate per the prescribed backup time periods and under all voltage conditions per UL and NFPA standards.System operation description including method of operation and supervision of each type of circuit and sequence of operations for all manually and automatically initiated system inputs and outputs. A list of all input and output points in the system shall be provided with a label indicating location or use of IDC, NAC, relay, sensor, and auxiliary control circuits. Alphanumeric Display and System Controls: Panel shall be included an 80 character LCD display to indicate alarm, supervisory, and component status messages and shall include a keypad for use in entering and executing control commands. Voice Alarm: Provide an emergency communication system, integral with the FACP, including voice alarm system components, microphones, amplifiers, and tone generators. Features include: Amplifiers comply with UL 1711, "Amplifiers for Fire Protective Signaling Systems." Amplifiers shall provide an onboard local mode temporal coded horn tone as a default backup tone. Test switches on the amplifier shall be provided to test and observe amplifier backup switchover. Each amplifier shall communicate to the host panel amplifier and NAC circuit voltage and current levels for display on the user interface.All announcements shall made over dedicated, supervised communication lines. All risers shall support [Class A][Class B] wiring for each audio channel.Emergency voice communication audio controller module shall provide up to 30 minutes of message memory for digitally stored messages. Provide supervised connections for master microphone and up to 5 remote microphones.Fire fighters' telephone communication system: Arrange system to use dedicated, two-way, supervised voice communication links between the FACP and remote fire fighters' telephone stations throughout the building.Fire Alarm Control Unit shall be capable of operating remote CRT's and/or printers; output shall be ASCII from an RS connection with an adjustable baud rate.Fire Alarm Control Unit shall be capable of operating a PC Annunciator which provides status annunciation and limited system control using a

Item No.	Description of Item
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	convenient and familiar Microsoft Windows® 2000 operating system based interface. PC Annunciator shall provide the following functions:FACP shall be with Login / Logout password protection with time duration selectable automatic logout. Displays: Alarm, Supervisory, Priority 2, and Trouble conditions with numerical tallies for each displays first and last alarms. Different event types have separate visible indicators with common audible indicator. Event logs can be searched and printed. View and / or print status reports and service reports (printing requires and available local or network printer).Alarm Silence, System Reset and priority to reset global and individual point acknowledge. Set system time and date and clear event log, individual point access for control or parameter revisions.Each RS port shall be capable of supporting and supervising a remote Printer; the FACP shall support as many as remote displays. The Fire Alarm Control Panel shall support five RS ports.Cabinet shall be Lockable steel enclosure. Arrange unit so all operations required for testing or for normal care and maintenance of the system are performed from the front of the enclosure. If more than a single unit is required to form a complete control unit, provide exactly matching modular unit enclosures. Operation and maintenance data for inclusion in Operating and Maintenance Manual. Include data for each type product, including all features and operating sequences, both automatic and manual. Provide the names, addresses, and telephone numbers of service organizations.Operating Temperature Range: 32° to 120°F(0°to 49°C) Operating Humidity Range: Up to 93% RH, non-condensing @ 90° F (32° C) maximum Approvals: UL Listed / FM approved **FACP 251-500 Devices (Maximum)**
79.0	**REPEATER PANEL / REMORT ANNUNCIATOR:** Repeater Panel / Remote LCD Annunciator with the same "look and feel" as the FACP operator interface. The Remote LCD Annunciator shall use the same Primary Acknowledge, Silence, and Reset Keys, Status LEDs and LCD Display as the FACP. Annunciator shall have super-twist LCD display with two lines of 40 characters each. Annunciator shall be provided with programmable control switches and associated LEDs. Under normal conditions the LCD shall display a "SYSTEM IS NORMAL" message and the current time and date. Should an abnormal condition be detected the appropriate LED (Alarm, Supervisory or Trouble) shall flash. The unit audible signal shall pulse for alarm conditions and sound steady for trouble and supervisory conditions. The LCD shall display the following information relative to the abnormal condition of a point in the system: 40 character location label. Type of device (e.g. smoke / pull station / water flow etc.). Point status (e.g. alarm / trouble). Operator keys shall be key switch enabled to prevent unauthorized use. The key shall only be removable in the disabled position. Acknowledge, Silence and Reset operation shall be the same as the FACP. Voltage: 20 to 32 VDC, system supplied Operating temperature range shall be : 0°

Item No.	Description of Item
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	to 40°C Operating Humidity Range: 10% to 90% from 0°to 40°C The Panel shall be fixed on wall with Surface mount box Approvals: UL, ULC Listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.
80.0	**Digital PABX System**
	6+8 Line Supply installation testing & commissioning of 6+8 line (extension capacity 24 lines) digital PABX system. Basic unit: 6+8 line PABX system Hardware: (CPU card, TNT card, power supply unit, & casing) Software: System operating software & billing software. Features: Direct inward station access including necessary, AUTO / DISA (voice), CID (caller ID), card co-line card, etc. built in billing system automatic fax / phone switching key telephone interface day / night service, total call report by extension, individual call report by extension, total call report by CO, individual call. Suitable for use in tropical country like BANGLADESH complete with required accessories and in conformity to specified codes & specification of international standards & CE / UL / CSA certified. Model & sample to be approved by the Engineer
81.0	**ADDRESSABLE TYPE PHOTOELECTRIC SMOKE DETECTOR** Addressable type Photoelectric Smoke Detector c/w Standard Base. Comply with internationally accepted standard "Smoke Detectors for Fire Protective Signaling Systems." Include the following features:The detector shall be Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore normal operation.Sensors shall be with Plug-In Arrangement and associated electronic components are mounted in a module that connects to a fixed base with a twist-locking plug connection. Base shall provide break-off plastic tab that can be removed to engage the head/base locking mechanism. No special tools shall be required to remove head once it has been locked. Removal of the detector head shall interrupt the supervisory circuit of the fire alarm detection loop and cause a trouble signal at the control unit.Sensors shall be with Quick Connect Arrangement: Photoelectric sensor and electronics in a single piece construction which shall twist-lock onto a mounting base that attaches to a standard electrical box.Each sensor base shall contain an LED that will flash each time it is scanned by the Control Unit (once every 4 seconds). In alarm condition, the sensor base LED shall be on steady. Each sensor base shall contain a magnetically actuated test switch to provide for easy alarm testing at the sensor location. Each sensor shall be scanned by the Control Unit for its type identification to prevent inadvertent substitution of another sensor type. Upon detection of a "wrong device", the control unit shall operate with the installed device at the default alarm settings for that sensor; 2.5% obscuration for photoelectric sensor, 135-deg F and 15-deg F rate-of-rise for the heat sensor, but shall indicate a "Wrong Device" trouble condition.The sensor's electronics shall be immune from false alarms caused by EMI and RFI.Sensors shall be including a communication transmitter and receiver in the mounting base having a

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	unique identification and capability for status reporting to the FACP. Sensor address shall be located in base to eliminate false addressing when replacing sensors. Removal of the sensor head for cleaning shall not require the setting of addresses. UL Listed temperature Range shall be: 0° to 38°C and Operating temperature range shall be : 0° to 50°C Housing color shall be Frost White. Smoke sensor Ambient Ratings: Air Velocity = 0-2000 ft/min (0-610m/min) Approvals: UL Listed/, FM approved/ LPCB approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally**.**
82.0	**ADDRESSABLE TYPE HEAT DETECTOR** Addressable type Heat Detector / Thermal Sensor: Combination fixed-temperature and rate-of-rise unit with plug-in base and alarm indication lamp; 135° F fixed-temperature setting except as indicated. Thermal sensor shall be of the epoxy encapsulated electronic design. It shall be thermistor-based, rate-compensated, self-restoring and shall not be affected by thermal lag. The Heat Sensors of fixed temperature sensing shall be independent of rate-of-rise sensing and programmable to operate at 135° F or 155° F. Sensor rate-of-rise temperature detection shall be selectable at the FACP for either 15° F or 20° F per minute. The Heat Sensors shall have the capability to be programmed as a utility monitoring device to monitor for temperature extremes in the range from 32-deg F to 155-deg F. Addressable type Heat Detector / Thermal Sensor: Combination fixed-temperature and rate-of-rise unit with plug-in base and alarm indication lamp; 135° F fixed-temperature setting except as indicated. UL Listed temperature Range shall be: 0° to 38°C and Operating temperature range shall be : 0° to 50°C Shall be suitable for Humidity range: 10% to 95% RH Housing color shall be Frost White. Approvals: UL listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.
	a) Rate of rise heat detector
	b) Fixed temperature heat detector
83.0	**ADDRESSABLE TYPE MANUAL PULL STATION:** Addressable type Manual Call Station of red LEXAN, with molded, raised-letter operating instructions of contrasting color. Station will mechanically latch upon operation and remain so until manually reset by opening with a key common with the control units.Shall be with compact construction, suitable to Electronics module enclosure minimizes dust infiltration. Allows mounting in standard electrical boxes. Screw terminals for wiring connections. Activation of the MCS will required a firm downward pull to activate the alarm switch. The pull lever latches into the alarm position and remains extended out of the housing to provide a visible indication. UL Listed Temperature Range: 32° to 120° F (0° to 49° C) intended for indoor operation. Humidity Range: Up to 93% RH at 100°F (38°C) Housing Colour shall be Red with white raised lettering. Housing and pull lever shall be

Item No.	Description of Item
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	made with Lexan Polycarbonate or equal. The MCS shall be semi-flash / surface mount type. Approvals: UL listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.
	Double action type
84.0	**STROBE WITH HORN :** Addressable type Horn with Strobe for Audible & Visible application, combination of Audible & Visible (A/V) Notification Appliances shall be listed to UL . The strobe light shall consist of a xenon flash tube and associated lens / reflector system. Provide a label inside the strobe lens to indicate the listed candela rating of the specific strobe. The horn shall have a minimum sound pressure level of 83 to 89 dB @ 24VDC. The audible / visible enclosure shall mount directly to standard single gang, double gang or 4" square electrical box, without the use of special adapters or trim rings. Shall be suitable to temperature range : 0° to 50° C Humidity Range: Up to 93% RH at 100°F (38°C) Approvals: UL listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.
85.0	**MONITOR MODULE :** Supply & installation of addressable - conventional interface module shall be used in the field wiring to connect the conventional Initiating devices with the addressable FACP interfaces to make the system convenient as when as required (configured by the service provider). The module shall be suitable for single address to the FACP on receiving signal from any conventional initiating device. The device shall be installed with a back box. The device shall be suitable for indoor use only. Shall be suitable to temperature range : 0° to 50° C Humidity range: Up to 90% RH at 35°C) Approvals: UL listed / FM approved. Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.
86.0	**ADDRESSABLE RELAY / CONTROL MODULE** Supply & Installation of Addressable Relay / Control Module shall be used in the field wiring to connect the conventional Initiating devices with the Addressable FACP interfaces to control / operate dampers, motors or similar appliances on receiving signal from the FACP as when as required (configured by the service provider). The device shall be suitable for indoor use only and shall be with back box. Shall be suitable to temperature range : 0° to 50° C Humidity Range: Up to 90% RH at 35°C) Approvals: UL listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.
87.0	**EMERGENCY LIGHT** Double tube, Length 12", Ceiling mounted Exit Light. Emergency lighting complying with international standards will be provided and comprise of single point, self-contained fittings with battery sized for minimum two hour illumination.

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88.0	**EVACUATION LIGHT/ ROUTE** "Evacuation light" complete with rechargeable battery & charger light & others necessary accessories suitable for AC / Dc power supply (220v single phase).
89.0	**EXIT LIGHT/SIGN** "Exit light" complete with rechargeable battery & charger light & others necessary accessories suitable for AC / Dc power supply (220v single p**hase).**
90.0	**FAULT ISOLATOR MODULE** Addressable type Isolator / Fault Isolator Module shall be used in the field wiring between the devices (contractor shall propose the quantity and location in the system required) to detect & isolate the devices at the time short circuit in SLC. The module shall be suitable to provide communications isolation to improve installation convenience and increase the system integrity. Isolation will be automatically activated when an output short circuit is detected (also be suitable for manual operation for isolation and trouble shooting for wiring problems). The device shall be suitable for indoor use only.Shall be suitable to temperature range : 0° to 50° C Humidity Range: Up to 90% RH at 35°C) Approvals: UL listed / FM approved Country of origin: AUSTRALIA / CANADA / JAPAN / USA / European countries or their licensed manufacturing units located globally.
91.0	**AMPLIFIER (175W-300W)** Dual channel audio power amplifier with the following features: rated output power: at 8Ω 1KHz (per ch) 175 W, at 4Ω 1KHz (per ch 270W, at 8Ω 1KHz(bridge mono) input sensitivity (8Ω, 1KHz): ≤ 20Ω (balance / unbalance), input impedance: 10kΩ unbalance / 20Ω balance, slow rate (8Ω full swing): ±40V / use, frequency response (±0.5 dB): 10Hz ~ 35 KHz etc. suitable for use in tropical country like BANGLADESH. Complete with required accessories and in conformity to specified codes & specification of international standard & CE / UL / CSA certified. Model & sample to be approved by the engineer.
91.1	**CEILING SPEAKER** Professional heavy duty, ceiling mounted speaker ideal for airports, lounges, convention centers, corporate boardrooms, hotels / hospital, house of worship, museums, offices, spaces schools, theaters & theme parks, superior sound quantity, wide dispersion and smooth off-axis coverage with following specification: Frequency range (normal): 50Hz to 20 KHz. (±3 dB) nominal impedance: 8Ω, nominal sensitivity (1W,2m): 90dB SPL, component: LF & HF driver, suitable for use in tropical country like BANGLADESH. Complete with required accessories and in conformity to specified codes & specification of international standard & CE / UL / CSA certified. Model & sample to be approved by the engineer.
	1.5W-6W
91.2	**COLUMN SPEAKER**
	Supply, installation, testing of ceiling / wall speaker ideal for airports, lounges, convention centers, corporate boardrooms, hotels / hospitality, houses of worship, museums offices, of patois, spaces schools, theaters and theme parks, superior sound quantity, wide dispersion and smooth

Item No.	Description of Item
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	off-axis overage, superior sound quality, wide dispersion and smooth off axis coverage, fast and easy installation. Line voltage : 70V / 100V Sensitivity : 90dB Frequency response: 150Hz-15KHz. Hole cutting size @ 175mm Baffle size @ 185 Installation : ceiling Enclosure material : Plastic Line load resistance : 666Ω Dispersion angle : 100° Suitable for use in tropical country like BANGLADESH. Complete with required accessories and in conformity to specified codes & specification of international standards & CE /
92.0	**FIRE MAN TELEPHONE JACK** Fire fighter remote telephone jacks for connected to the emergency telephone system have screw terminals and a red backed enamel finish with a white silk-screened telephone hand set icon on them complete as required. **Listed: UL/ULC/EN/VDS/JIS**
93.0	**FIRE MAN TELEPHONE SETS** Supply installation testing & commissioning of single line telephone set for executive use with provision volume up+ down, redial, flash etc. including display with CID system complete. Suitable for use in tropical country like BANGLADESH complete with required accessories and in conformity to specified codes & specification of international standards & CE / UL / CSA certified. Model & sample to be approved by the Engineer
94.0	**ELECTRICAL WORKS FOR FIRE DETECTION SYSTEM**
	Surface wiring (FR) (through PVC conduit): Surface conduit wiring with the following Fire & Flame Retardant FR (PVC) insulated and stranded cable and FR (PVC) insulated ECC wire connecting at both ends through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet pull box with 3 mm thick ebonite sheet cover, fixing materials, other accessories etc. including mending the damages good as required. All electrical contacts shall be of brass/copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC/BDS/BS/VDE standards and as per detailed specification mentioned in Annexure-A. The work shall be carried out as per direction/approval/acceptance of the Engineer. Cables manufactured by Govt. of Bangladesh owned / shared Company Ltd (Eastern Cables) approved by the Engineer.
94.1	1C-2x1.5 sq.mm. (FR) cable with 1.5 sq.mm (FR) ECC wire through PVC pipe of minimum inner dia 20 mm having wall thickness of 1.5 mm
94.2	1C-2x2.5 sq.mm. (FR) cable with 2.5 sq.mm (FR) ECC wire through PVC pipe of minimum inner dia 25 mm having wall thickness of 1.5 mm
95.0	**ELECTRICAL WORKS FOR FIRE PA SYSTEM:** Alda 10 GA speaker cable through pvc conduit, tray/ ladder complete with bends, tees, junction box etc.
96.0	**ELECTRICAL WORKS FOR FIRE FIREMAN TELEPHONE SYSTEM :** Supplying and drawing of following sizes PVC insulated & sheathed twisted pair telecommunication cables having Dia. of each core is 0.6 mm through pre-laid pipes. Cable

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	manufacturer(s) must have valid test certificate from internationally accredited laboratory (like CPRI, KEMA etc.) approved / accepted by the Engineer.
	1C-4x0.282 sqmm (2 pair)
97.0	**SHOP DRAWING & DOCUMENTATION :** Preparation of detail Shop drawing including, layout drawing, section details, schematic drawing, etc. Get approval of shop drawing before any fabrication or installation works. Shop drawing must be coordinated with other services likely Electrical cabling, Light Fixtures, False Ceiling and Interior design. The work also includes: a)Show actual dimension of Equipment. b) Submit actual Wattage rating of all equipment c) Reconfirm Electrical cable sizing d) Submit Electrical connection diagram of Electric Panels e) Submit General arrangement of Electric Panels f) Submit advance copy of Installation, Operation and maintenance manuals.
98.0	**AS-BUILT DRAWING :** Preparation and submission of As-built drawing in following forms: One set in tracing paper, size A1 Two sets print out in A1 Paper Soft Copy in CD in AutoCAD Version 2010 Soft Copy in PDF Version
99.0	**TESTING, COMMISSIONING & BALANCING :** After proper installation and certification the system shall be tested, commissioned and balanced as per direction and recommendation by the Manufacturer as well as Designer.
100.0	**TAGGING, IDENTIFICATION & SIGNAGE INDICATION :** As per NFPA Code.

LIST OF RECOMMENDED MANUFACTURERS

Water Chiller	Carrier/Trane/Dunham Bush/Daikin/Rhoss/AERMEC
Fan Coil Unit	Carrier/Trane/Dunham Bush/Daikin/Rhoss/AERMEC
Fans	Nicotra / Fantech / S&P / Chicago / Rhoss/ GEC-Woods / Kruger / Systemair/ Sodeca / Casals/ Blauberg or equivalent.
Pumps	Ajax / Grundfos / Monoflo / Bell & Gosset / Rhoss/ Paco / Paragon / Calpeda /Armstrong / Wilo / Ebitt/General or equivalent.
Pump Motor	Siemens / Teco / GEC / ABB / Toshiba / Calpeda / EMM or equivalent.
Valves, Y-Strainer, Flexible Pipe Connection	Crane / Kitz / Nibco / Tozen / Toyo / Maple/ Metraflex / AFA / Birflex / Ekoval / TECOFI / Caleffi or equivalent.
Balancing Valve	Tour and Anderson / Crane / Combi / FlowCon / Oventrop/ TECOFI/ Caleffi or equivalent.
Vibration Isolation / Silencer	Mason Industries / Kinetics or equivalent.
Water Treatment Chemicals	Ecolab / Water Services UOP / Mazer Chemicals/Petaling or equivalent.

Pressure Gauge Pipe Thermometer	Hunter / Weksler / Brannan / Metraflex / Clayton / Singer / Taylor /Maple/Tozen / Caleffi or equivalent.
Water Flow Meter (Digital)	Data Industrial/Asahi/Aichie Tokei/Blue White/Calffi or equivalent.
Insulation (Rockwool / Glass wool)	Bradford / Polyglass / Foster / Byuksan /Polywool or equivalent.
Insulation (PEF / Nitrile Rubber)	Superlon / Wide / Armaflex / Armacell / Aerocell/ ALP Aeroflex or equivalent.
Duct Insulation (PE insulation)	Jumboo / Polycell or equivalent.
Flexible round duct	Thermaflex / Aeroduct / Civa Flex / Ruskin / Titus or equivalent.
Air Terminals, Variable Air Volume	Titus / Price / Connols-Aire / Trox / System Aire / Halton / Ruskin / Bavcol Air/ Acutherm /Belimo or equivalent.
Automatic Controls system	Johnson Controls/Honeywell / Siemens / Delta/ Regin or equivalent.
Flow Switch	Johnson Controls/Honeywell / Siemens / Delta or equivalent.
Control Valve	Johnson Controls/Honeywell / Siemens/ Belimo/Regin or equivalent.
Expansion Tank (Closed type)	Automatic Heating Appliances / Pneumatex / Monoflo / Emtrol/Reflix or equivalent.
Electrical Components	AEG / Siemens / Telemecanique / GE / ABB / Dorman smith / MEM / Merlin Gerin or equivalent.
Variable Frequency Drive	Siemens / Danfoss / Telemechanique /ABB/Yaskawa or equivalent.
Modulating Control Valve	Siemens, Johnson controls, Belimo, Honeywell or equivalent.
Air Filter / Safe Change Filter (BIBO)	Camfil / Flanders / AAF / Air Guard / Faar / Trox or equivalent.
Electric Cable	Paradise / BRB / BBS or equivalent.
Fire Damper	Trox/Connols Aire/Ruskin or equivalent.
Pre-insulated pipe	SeAH/ Ricwil/ Husteel/ Glensule or equivalent.

RECOMMENDED LIST OF MATERIALS AND MANUFACTURERS

Equipment	Manufacturer
Fire Pumps and Accessories	
Fire Pump and Jockey Pump	Patterson USA/ KSB, Germany/ Grundfos, Denmark/ NAAFCO, UAE/ Xylem, USA/ SFFECO, UAE/ Lifeco, UAE/ Ebitt, Turkey/ Wilo, Germany/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**

Diesel Engine	Cummins USA/ Catterpillar USA/ Clarke-Gem USA/ Detroit, USA/ Parkins, UK/ Fire Driver, UAE/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Valves and Accessories	Nibco USA/ Stockham USA/ Mueller USA/ ITT Grinnel USA/ Keystone USA/ KSB, Germany/ Shield, UK/ Rapidrop, UK/ Tozzen, Japan/ Kenedy USA/ Rapidrop, UK/ Val- Matic USA/ Metraflex USA/ ITT-Hoffman USA/ Bell & Gossett USA/ Apco USA/ Armstrong USA/ Claval, USA/ NAFFCO, UAE/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Water Flow Meter	Gerand USA/ Eagle Eye-Annubar USA/ Meriam Instrument USA/ Global Vision USA/ Meccan USA/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Pressure Gauge	March USA/ Trerice USA/ Weksler USA/ Jumo Germany/ Wika Germany/ Rueger SA Switzerland/ Shield, UK/ **Or equivalent**
Alarm Valve	Viking USA/ Gem USA/ Chemetron USA/ Firematic USA/ Shield, UK/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**

Sprinkler Head **Fire Hose Reels & Cabinets**	Gem USA/ Viking USA/ Central USA/ Reliable USA/ Tyco, USA/ NAAFCO, UAE/ Ardenoak UK/ Angus UK/ Macron UK/ Shield,UK/ Potter, USA/ Rapidrop,UK/ Spark, UK/USA/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Fire Alarm Equipment	Johnson Control USA/ Honeywell USA/ NOHMI, Japan/ Edwards USA/ Fire-Lite USA/ Aritech USA/ Pyrotronics USA/ Ademco USA/ Kidde USA/ Gamewell USA/ Simplex USA/ Mirtone Canada/ Wormald Australia/ Shield, UK/ Simplex/ Bosch/ Cooper Fire, UK/ Ansul USA/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Fire Barrier System	3M USA/ GE USA/ Wormald USA/ Furukawa Japan/ KBS Germany/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Foam System	Chemguard USA/ Buckeye USA/ Ansul USA/ National Foam, USA/ NOHMI, Japan/ NAFFCO, UAE NM Fire, France/ Lifeco, UAE/ **Or equivalent**

Clean-agent Suppression System	Chemguard USA/ Buckeye USA/ Ansul USA/ NOHMI Japan/ DUPONT, USA/ NM Fire, France/ Lifeco, UAE/ **Or equivalent**
Smoke Curtain	Stoebich/ Coopers Fire/ Colt/ Kent/ **Or equivalent**

Section 8. Particular Specifications

01. The work must be carried out strictly in accordance with the specification and as per specifications of the items of work of the tender schedule, drawing, design (Which will be supplied by the Department) and also as per direction of the engineer-in-charge. The contractor shall remain fully responsible for the quality of work and finishing the same.

02. The rate quoted by the Contractor should include the cost of all materials and of all operations, which are connected with the items of work. In other words, the rates are meant for finished job in all respects and as per practice and convention followed by the Department. Cost of layout, dismantling, site cleaning, scaffolding, cleaning of mosses from bricks, washing dirt/clay from the materials, screening and washing the chips and shingles etc. Unrolling, straightening and removing rust from steel materials and cost of all local and other taxes, tolls and incidental charges, all taxes including VAT will be treated as having been included in the rates of the tender.

03. Name of work should be written fully over sealed cover in this regard of the Instruction to Tenderers (ITT) to be followed strictly.

04. All relevant documents supplied duly signed by the tenderer in every page and be binding upon the tenderer.

05. Before submitting the tender the tenderer should inspect the site of work thoroughly in consultation with concerned Executive Engineer, BEZA Monem Business District (Level-12), 111, Bir Uttam C.R. Dutta Road, Dhaka-1205. The contractors shall have to arrange necessary place for storing construction materials at his own arrangement near the construction site. No extra claim will be entertained for storing materials, any carriage of materials, cleaning the site, making roads, working space in site etc. under any circumstances.

06. All materials should be supplied by the Contractor. The Contractor's supplied materials must be of good quality and sample to be approved by the Engineer-in-charge before procurement.

07. If any portion of work found unspecified, that portion of work must be checked and verified by the Departmental staff before dismantling the same and the dismantled portion should be removed by the Contractor at his/ their own cost and no payment will be made for such work. In no circumstances the unspecified work will be entertained.

08. The quantities of the work may vary at the time of execution of work and some items may not be executed at all. For such work no claim will be entertained. No extension of time will be allowed for excess quantity of work done.

09. For misuse, damage or pilferage of materials supplied by the Department or supplied by the Contractor and if any accident of labourer's occurred the Contractor himself will be liable and no claim will be entertained. For misuse and pilferage of Government materials (if any) the cost will be recovered at double the issue rate.

10. Work program in bar chart and network diagram of the principal activities, including those on a critical path method and probable timing of the assignment of each item of work to be accomplished and submitted along with the tender by the Contractor/Firm. The program will have to be jointly signed by the contractor and Engineer-in-charge of the work before taking up the same.

11. If the contractor is unable to keep up the progress without justifying reason thereof, the contract will stand liable to be rescinded by the competent authority.

12. In case of dismantling any existing structure, measurement should be taken properly in the M.B in time for making any payment in due course.

13. The work may be done round the clock for which under any circumstances no extra claim will be entertained.

14. No claim from the Contractor shall be entertained if the work is not executed for any reason.

15. Running payment of work may be made.

16. The arrangement of water supply, sanitation, electrification, gas connection etc. If any required for the purpose of construction of work should be made by the contractors himself at his/ their own cost and risk.

17. All salvage i.e. dismantled materials of this work must be returned to this Department failing which the cost there of will be realized from the Contractor's bills as per current schedule of rates or present market rate whichever is higher.

18. The material will be tested from BUET/CUET/RUET/KUET/DUET or equivalent organization (as per selection from Project Manager) as and when required, by the Contractor for which no extra payment will be made by the Department.

19. The contractor shall have to arrange and bear the expenses of all kinds of tools and plants, which will be necessary for this work.

20. No claim for enhancement of rate of any item of the schedule will be entertained due to fluctuation of market rate for labours and of materials along with the period of execution of the works including extended time on genuine reasons.

21. Verbal instructions, whatsoever and from whomsoever will have no binding. All such instructions must be in writing from competent authority.

22. The contractor or his/ their representative will have to be available at site to receive instruction from the Departmental Staff and Engineer-in-charge in connection with the work.

23. The contractor shall have to follow the instructions of the Engineer-in-charge. No work should be carried out as per sweet will of the Contractor.

24. If the contractor makes delay to remove the rejected materials from the site, then and there, the Department shall remove the materials by engaging labourer’s or other agency and no claim will be entertained for the value of the materials and the cost involved for removal will be deducted from the Contractor's bill even from security deposit of fixed deposit.

25. No running bill or final bill be passed if the period of work thereof is not found to be covered by the time allowed in the tender agreement or by extension of time already allowed.

26. The Contractor shall have to bear the expenses of all kinds of test, which will be necessary time to time for this work for which no extra payment will be made by the Department.

31. All materials will be of high quality. Requisite test result should conform to the required.

32. Shop drawing must be submitted by Contractor to Department and take approval before starting work.

Section 9. Drawings

Notes on Drawings (Attached) : For tender purpose only-In Annex-1 & Annex-2

Section 10.Environmental Management Plan (EMP)

1. The Contractor shall carry out all mitigation and enhancement measures (including those related to mitigation of air/noise/water pollution; drainage/traffic congestion) as specified in the Environmental Management Plan (EMP) as below :

Environmental Aspect	Mitigation Measures	Location	Time Frame
Mobilization & Site Clearance			
Removal of Vegetation	Vegetation will be removed from the ROW before the commencement of Construction after obtaining necessary permissions	ROW	Before construction Starts and after centre line marking at site
Dredging components, Dumpy level, Grader, Dozer	Specifications of Dredging components, Dumpy level, Grader, Dozer, other Construction Vehicles, Equipment and Machinery to be procured will comply to the relevant Standards/ norms and with the requirements of the relevant current emission control legislations		Prior to mobilisation at site
Setting up of construction camps	The construction camps will be located far away from habitations and sensitive locations The Contractor during the progress of work will provide, erect and maintain necessary (temporary) living accommodation and ancillary facilities for labour to standards	All areas in vicinity of construction campsite	During Establishment, Operation and Dismantling of Such Camps.
Identification of debris dumping sites	Location of debris dumping sites shall consider the following, • Shall not be located within designated forest areas. • dumping shall not impact natural drainage courses • Settlements are located at least 1 km away from the site.	Throughout the corridor	During mobilisation

CONSTRUCTION STAGE			
Land			
Soil Erosion and Sedimentation control	Contractor should plan the activities so that no naked / loose earth surface is left out before the onset of monsoon, for minimising the soil erosion following preventive measures to be taken such as: • Top soil from borrow area, Debris disposal sites; borrow area, construction site to be protected / covered for soil erosion. • Along sections abutting water bodies, stone pitching needs to be carried out	Throughout Project Corridor, Service roads and equipment storage sites, etc.	Upon completion of construction activities at these sites.
Contamination of soil	• Vehicle / machinery and equipment operation, maintenance and refuelling shall be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. An "oil interceptor" will be provided for wash down and refuelling areas. • Fuel storage shall be in proper bunded areas. All spills and collected petroleum products shall be disposed off safely without causing any contamination • Plant to be set up 500 m away from surface water body. • Oil interceptor will be installed at construction site. • Septic tank will be constructed for safe disposal of waste.	At fuel storage areas – usually at construction camps, temporarily acquired site.	During Construction.
Material sources	• Adequate safety precautions shall be ensured during transportation of quarry material from quarries to the construction site. Vehicles transporting the material shall be covered to prevent spillage. Operations to be undertaken by the as per the direction .		During construction
Disposal of Debris	The disposal of debris shall be carried out only at sites identified for the purpose. All arrangement for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary will be considered incidental to the work and should be planned	Sites identified by the contractor	During Construction
Air			
Dust Generation	• Vehicles delivering materials should be covered to reduce spills and dust blowing off the load. • Clearing and grubbing to be done, just before the start of next activity on that site. • In laying sub-base, water spraying is needed to aid compaction of the material. After the compaction, water spraying	Throughout Project Corridor, all access roads, temporarily acquired	Beginning with & throughout construction until asphalting is completed and side slopes are covered.

	should be carried out at regular intervals to limit the dust to below • Road surface should be cleaned with air compressor and vacuum cleaners prior to the construction works. Manual labour using brooms should be avoided, if used labour to be provided masks. • The Contractor shall take every precaution to reduce the level of dust emission from the hot mix plants and the batching plants . • Plants, machinery and equipment shall be so handled (including dismantling) as to minimise generation of dust.	sites.	
Equipment Selection, Maintenance and Operation	• All vehicles, equipment, crushers and machinery used for construction shall be regularly maintained to ensure that pollution emission levels comply with the relevant requirements.	Throughout Project Corridor, all access roads, sites temporarily acquired and all borrow areas.	During Construction.
Pollution from Crusher	•	All Aggregate Crushing Plants.	During Erection, Testing, Operation and Dismantling of Such plants.
Water			
Loss of water bodies/ surface / ground	• No excavation from the bund of the water bodies. • No debris disposal near any water body. • Prior written permission from authorities is required for use of water for construction activity. • Construction labours to be restricted from polluting the source or misusing the source. • Labour camps will be located away from water bodies.	Near all water bodies	During construction
Silting / sedimentation	• Silt fencing shall be provided around water bodies to prevent runoff of sediment from construction site •		Throughout construction period
Contamination of water	• Construction close to water bodies shall be avoided	All areas in	Throughout construction

	• Car washing / workshops near water bodies will be avoided.	immediat e vicinity campsite.	period and during Operation and Dismantling of Camps.
Noise			
Noise from Vehicles, Plants and Equipment	• Noise standard at processing sites, eg. Aggregate crushing plants, batching plant, hot mix plant , any machinery will be strictly monitored to prevent exceeding of noise standards. • Workers in vicinity of loud noise, and workers working with or in crushing, compaction, concrete mixing operations shall wear earplugs and working time should be limited as a safety measure. • In construction sites within 150 m of sensitive receptors construction will be stopped from 20:00 to 06:00. • .	Througho ut Project Corridor, all access roads, sites temporari ly acquired and all borrow areas.	Throughout construction
Noise from Blasting or Pre-splitting Operations	• Blasting shall be carried out during fixed hours (preferably during mid-day), All statutory laws, regulations, rules,pertaining to acquisition, transport, storage, handling and use of explosives shall be followed. •	All Blasting and Pre-splitting Sites.	During Preparation, Operation and Closure of Such Sites.
Flora & Fauna			
Socio – Economic Environment			
Accidents	• The contractor will provide, and maintain barricades, including signs marking flats, lights and flagmen . • All Accidents shall be reported immediately and incident analysis, preventive measures shall be implemented.		During Construction
Road Safety And Construction Safety			
Construction Safety	• Adequate precautions will be taken to prevent danger from electrical equipment. • No material or any of the sites will be so stacked or placed as to cause danger or inconvenience to any person or the public. • Fencing and lights shall be provided to protect the public. • All machines to be used in the construction will conform to the relevant Standards, will be free from defect, will be kept in good working order, will be regularly inspected and properly maintained.	Entire Project site.	During Construction
Risk at Hazardous Activity	• All workers employed on mixing asphaltic material, cement, lime mortars, concrete etc., will be provided with protective	Entire Project site.	During Construction

	footwear and protective goggles. • Workers, who are engaged in welding works, would be provided with welder's protective eye-shields. Stonebreakers will be provided with protective goggles and clothing and will be seated at sufficiently safe intervals. • . A register of all toxic chemicals delivered to the site shall be kept and maintained up to date. The register shall include the trade name, physical properties and characteristics, chemical ingredients, health and safety hazard information, safe handling and storage procedures, and emergency and first aid procedures for the product.		
Risk caused by Force' Majure	All reasonable precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work.	Entire Project site	During Construction
Health and Safety Measures	• At every workplace, a readily available first aid unit including an adequate supply of sterilised dressing material and appliances will be provided as per the Labour Act-2006.. • Adequate safety measures and PPE for workers during handling of materials at site will be taken up.	Entire Project site.	During Construction
		All construction sites	During construction
Hygiene	• Latrines shall be provided with septic tank. The effluents can be diverted for horticulture inside the camps. • The septic tank may be cleaned once in 6 months and filter cleaned after a year. • All temporary accommodation must be constructed and maintained in such a fashion that uncontaminated water is available for drinking, cooking and washing. • Garbage bins must be provided in the camps and regularly emptied and the garbage disposed off in a hygienic manner. • Adequate health care is to be provided for the work force. Unless otherwise arranged for by the local sanitary authority, the local medical health or municipal authorities. • On completion of the works, all such temporary structures shall be cleared away, all rubbish burnt, septic tank and other disposal pits filled in and effectively sealed off and the outline site left clean and	All Worker's Camps	During construction

	tidy, at contractor's expense.		
Clearing of Construction of Camps & Restoration	Contractors shall prepare site restoration plans. The plans shall be implemented prior to demobilization. On completion of works, all temporary structures shall be cleared, all rubbish burnt, excreta or other disposal pits or trenches filled in and sealed and the site left clean and tidy, .	All Workers' Camps	
Resettlement and Social Management Framework of BEZA			
Abbreviated resettlement Plan of Mirsharai	• After Payment of Compensation, contractor can start the construction activities. • Contractor will ensure employment from affected people as per their qualification • After relocation of affected houses Contractor can start the construction		

Temporary Works:

1. The Contractor shall make sure that all equipment and safeguards required for the construction work such as temporary stair, ladder, ramp, scaffold, hoist, run away, barricade, chute, lift, etc. are substantially constructed and erected, so as not to create any unsafe situation for the workmen using them or the workmen and general public passing under, on or near them.

Health and Safety:

- The Contractor shall observe and maintain standards of Health and Safety towards all of his employees not less than those laid down by the national standards or statutory regulations.

- Where appropriate, to prevent workers falling from heights, the Contractor shall make sure that every temporary floor openings shall either have railing of at least 900 mm height or shall be constantly attended; every floor hole shall be guarded by either a railing or a hinged cover, or constantly attended; every stairway floor opening shall be guarded by railing at least 900 mm high on the exposed sides; every ladder way floor opening or platform shall be guarded by a guard railing; every open sided floor or platform 1.2 m or more above adjacent ground level shall be guarded by a railing on all open sides.

- The Contractor shall provide all appropriate protective clothing and equipment for the work to be done and ensure its proper use. Where required, safety nets, belts, harnesses and lines shall be provided by the contractor. The "safety directives for work equipment" and "safety directives for protective gears", as specified in the Occupational Health and Safety Guidelines (attached) shall be followed.

- The Contractor shall provide and maintain in prominent and well-marked positions all necessary first-aid equipment, medical supplies and other related facilities. A sufficient number of trained personnel will be required to be available at all times to render first aid.

- The Contractor must provide or ensure that appropriate safety and/or health signs are in place at their work sites where hazards cannot be avoided or reduced.

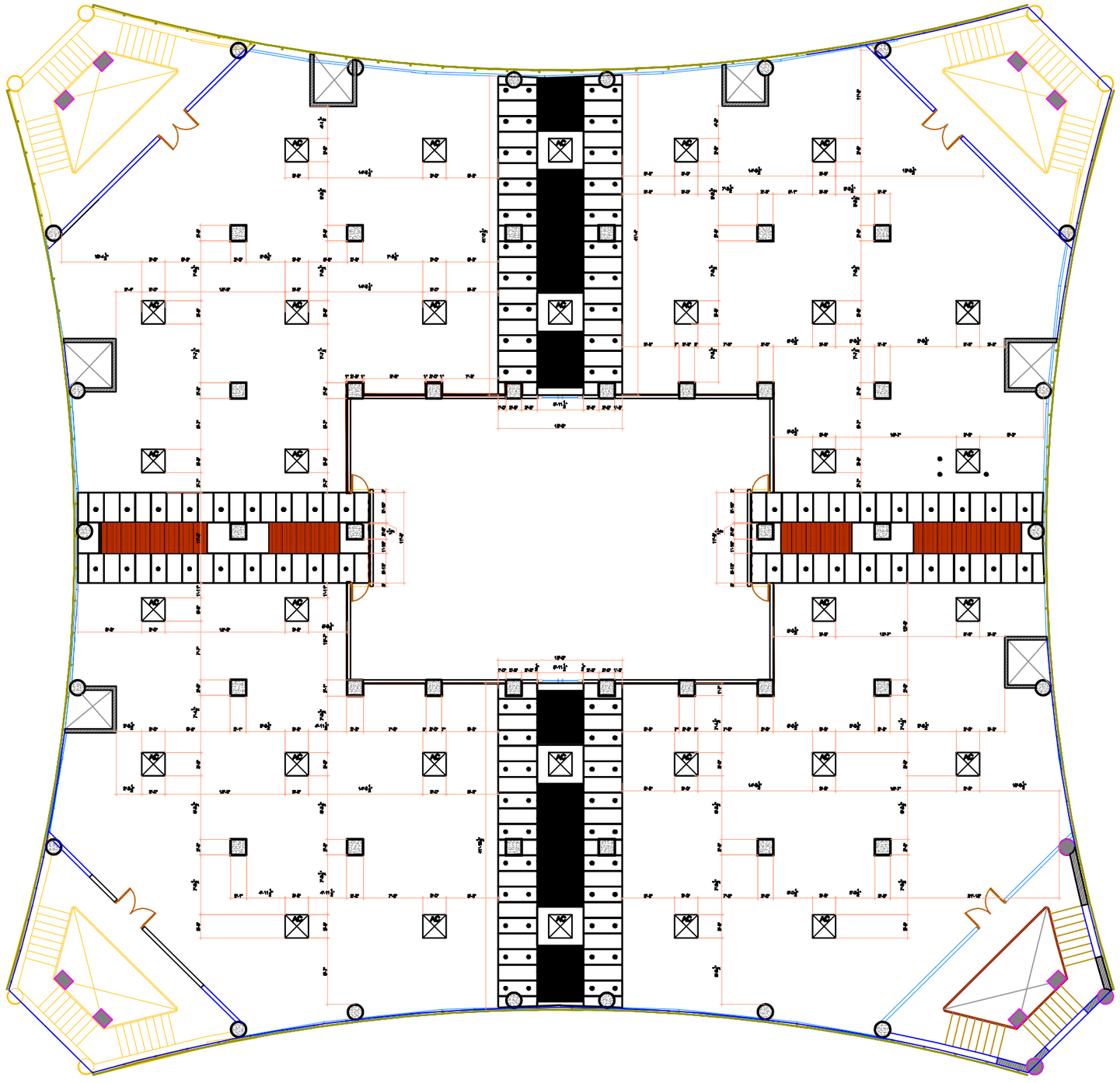
- The Contractor shall report to the Engineer promptly and in writing particulars of any accident or unusual or unforeseen occurrences on the site, whether these are likely to affect progress of the work or not.

Disposal and Pollution:

- The Contractor shall not dispose any waste, rubbish or offensive matter in any place not approved by the Engineer or Statutory Authority having jurisdiction. The Contractor shall not discharge into any watercourse oil, solids, noxious or floating materials.

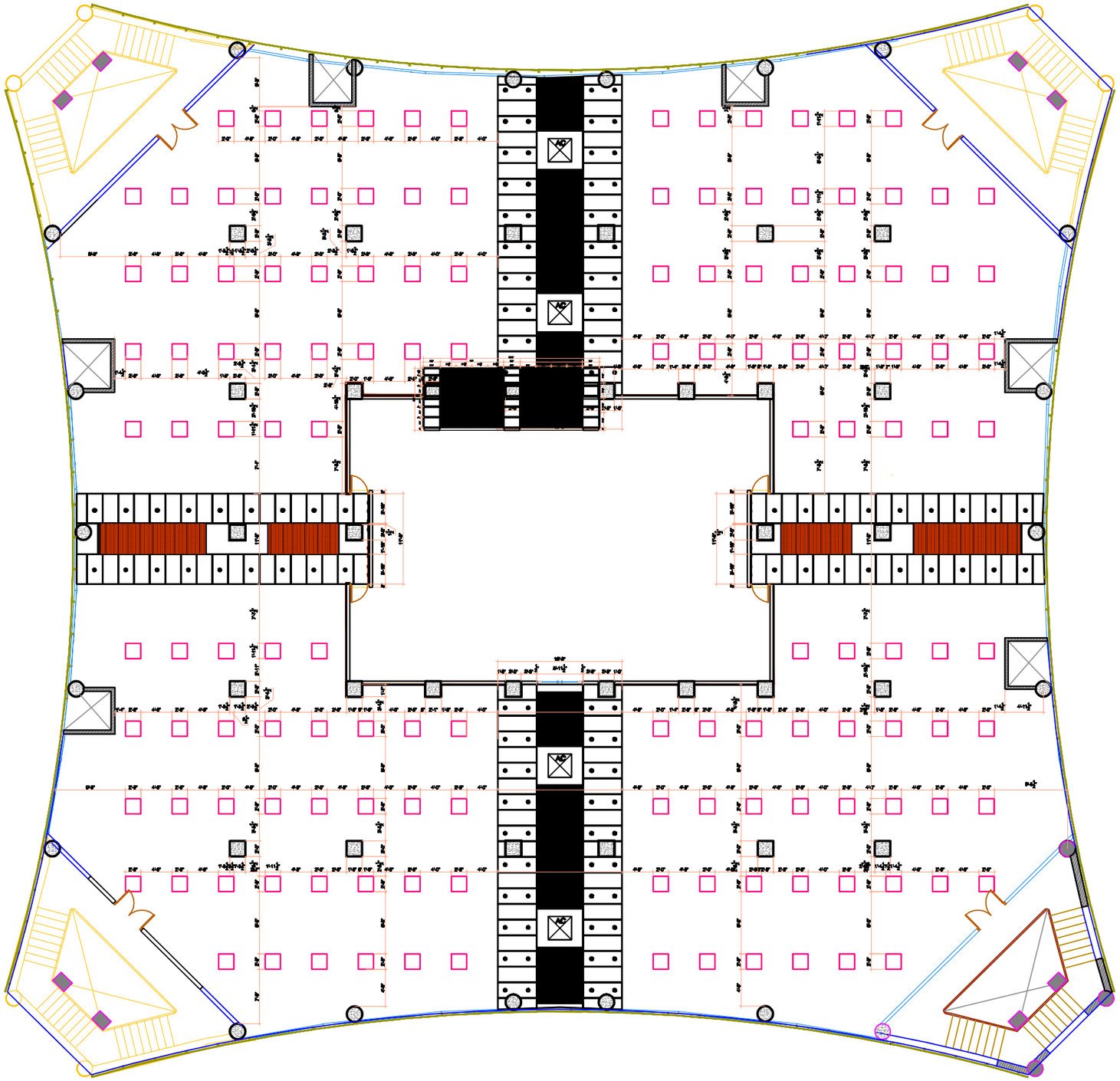
- The Contractor shall take all reasonable precautions to keep public or private roads clean of any spillage or droppings from his vehicles or equipment. Any spillage or droppings which accrue shall be cleaned without delay to the satisfaction of the Engineer.

The Contractor shall construct sanitary latrine or septic tank system or install portable cabin toilet for disposal of human waste in the site office and temporary labor sheds for workers/ employees; the Contractor shall provide waste bins/ cans for collection of solid waste at appropriate locations (as directed by the Engineer), and ensure proper transfer/ disposal of solid waste.



AC LAYOUT PLAN

SCALE : AS SHOWN



LED LIGHT PANEL LAYOUT

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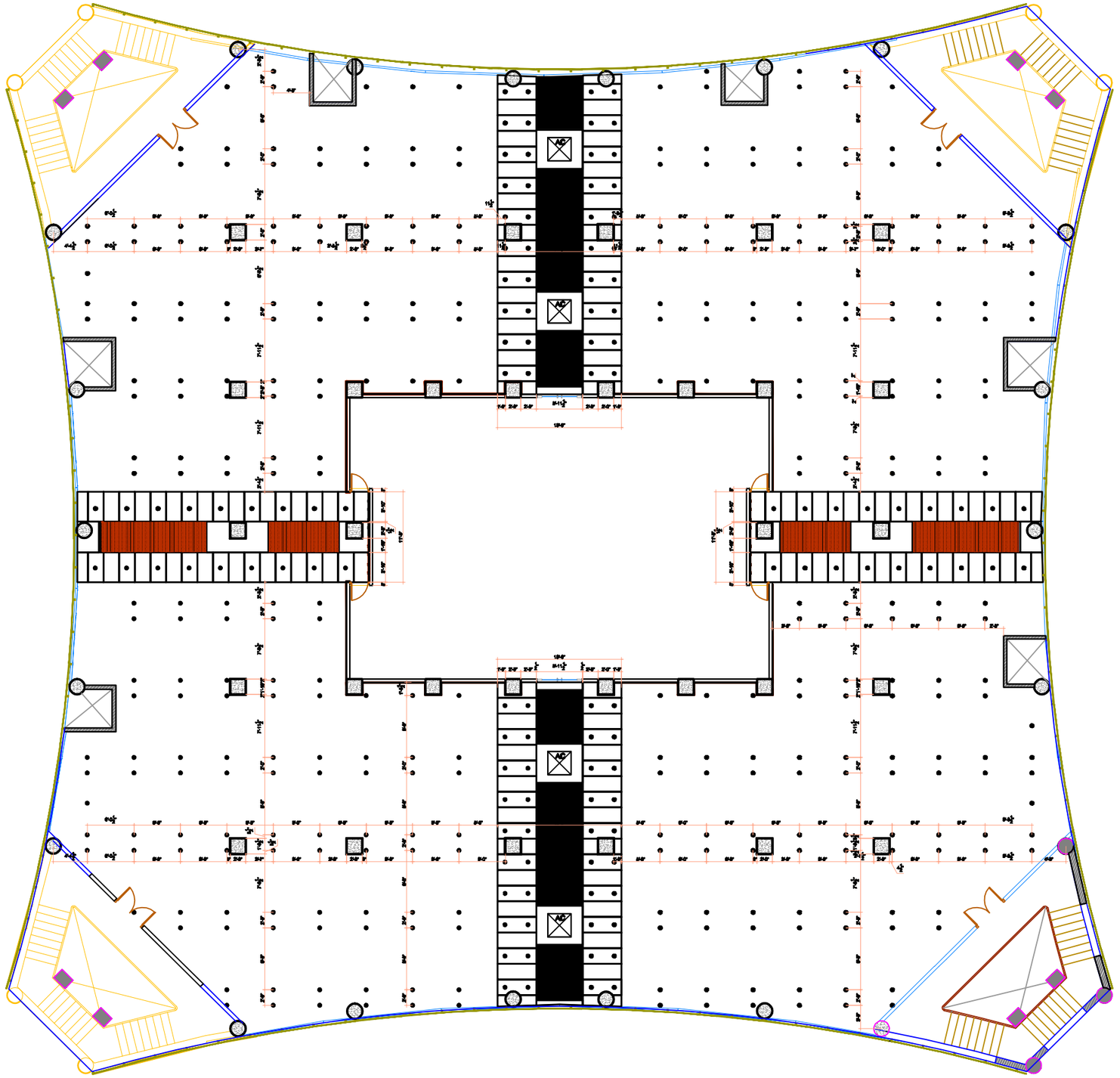

SPOTLIGHT LAYOUT

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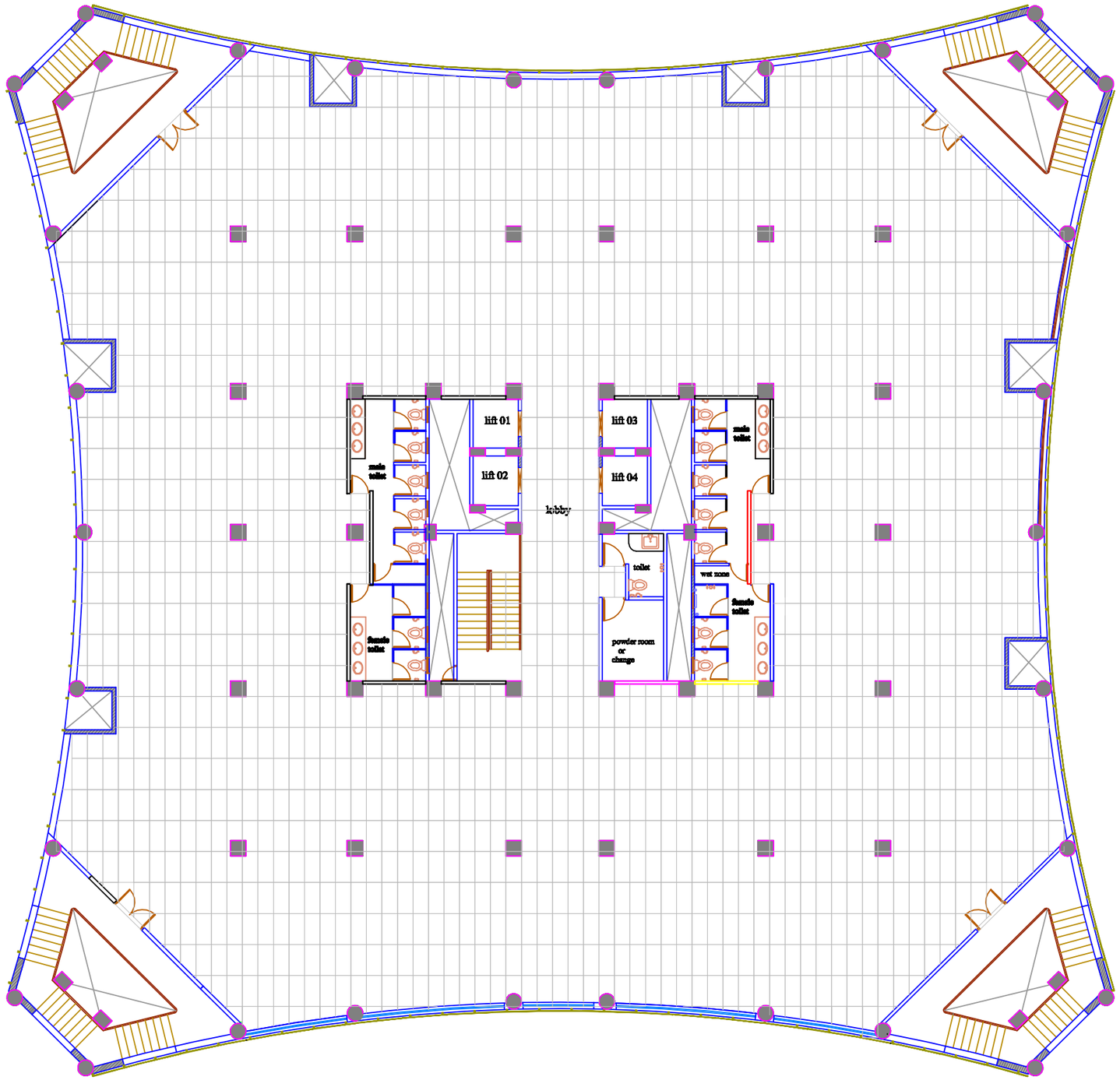

TILES LAYOUT PLAN

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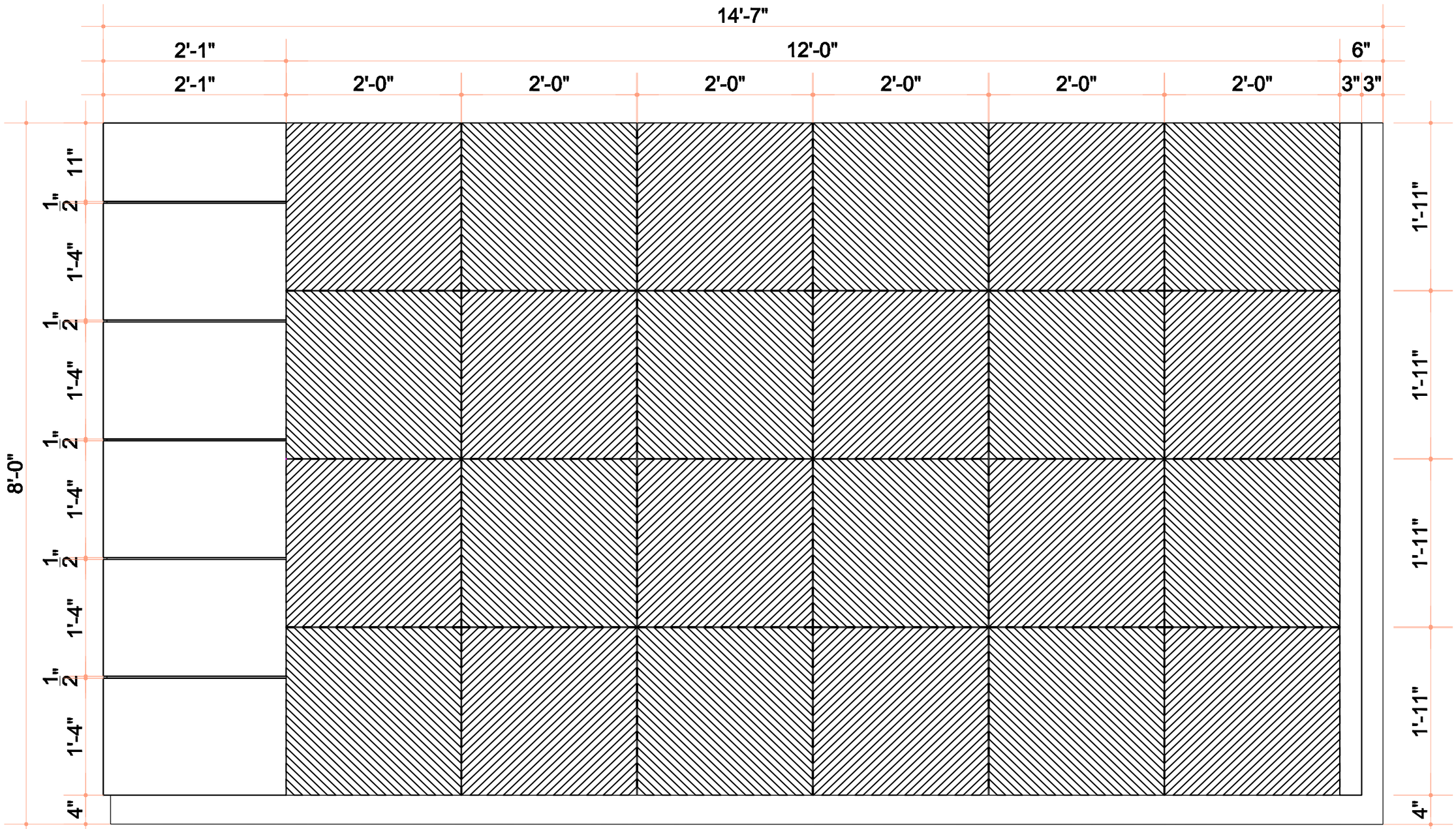
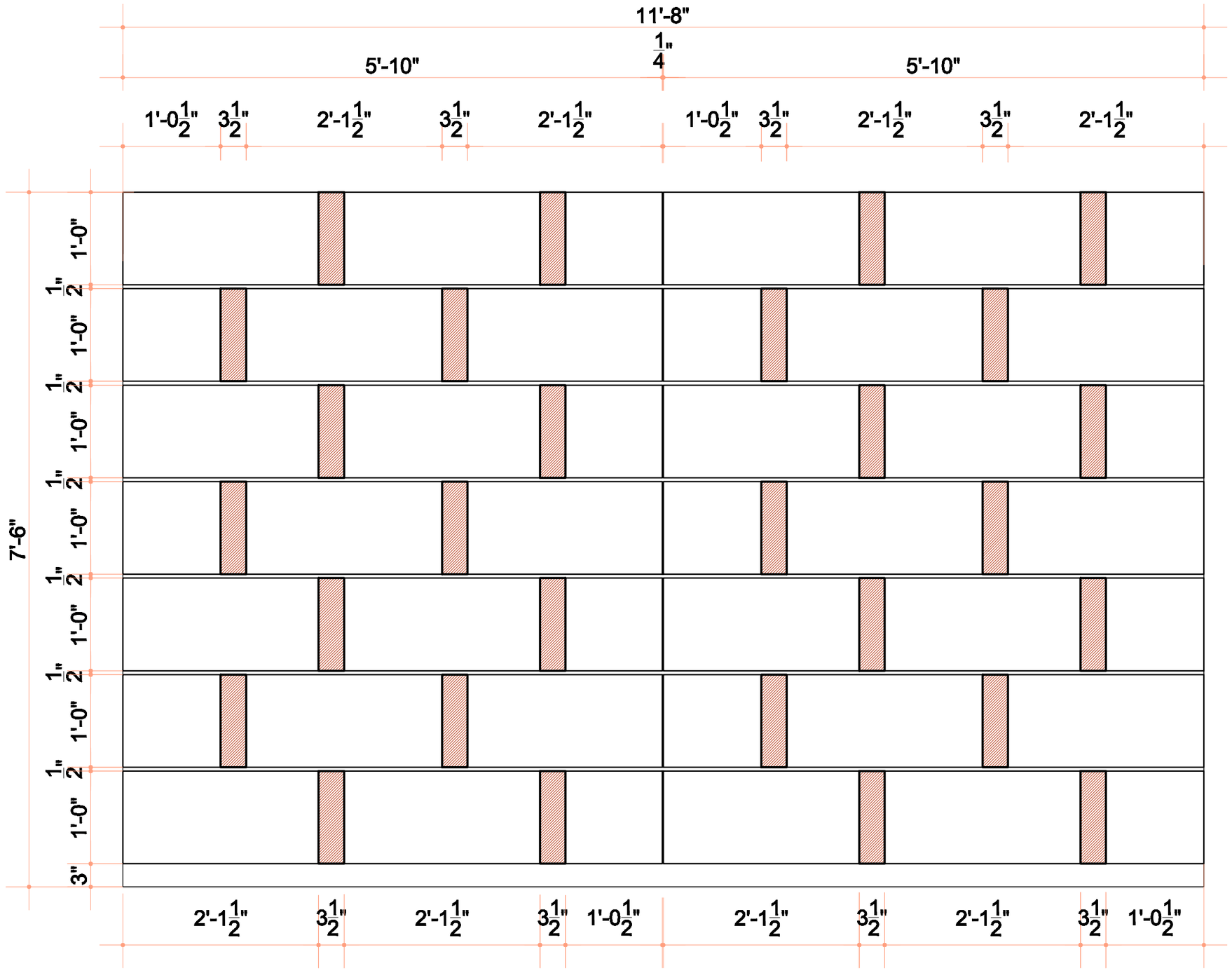


NORTH SIDE LEFT FACADE



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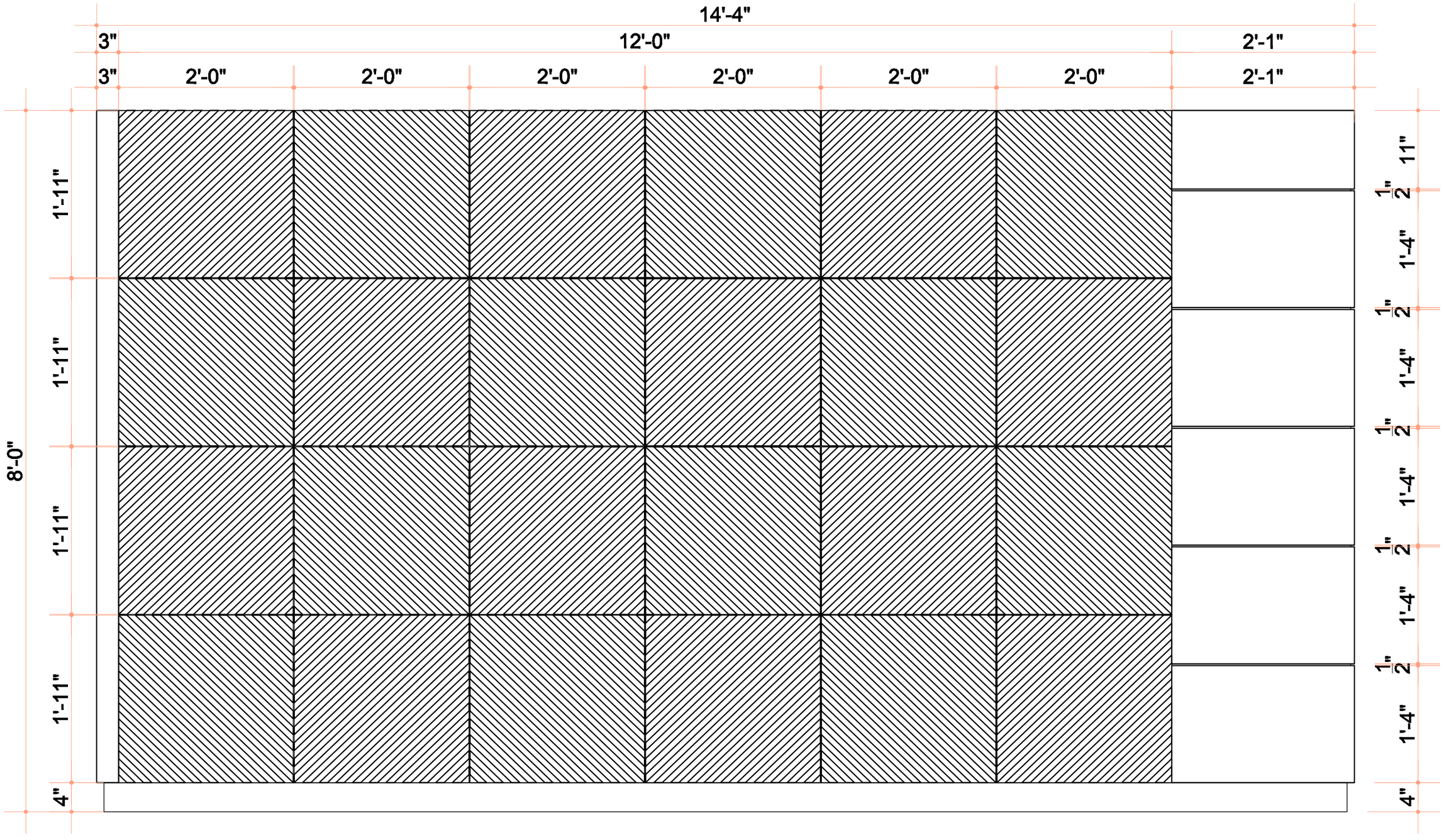
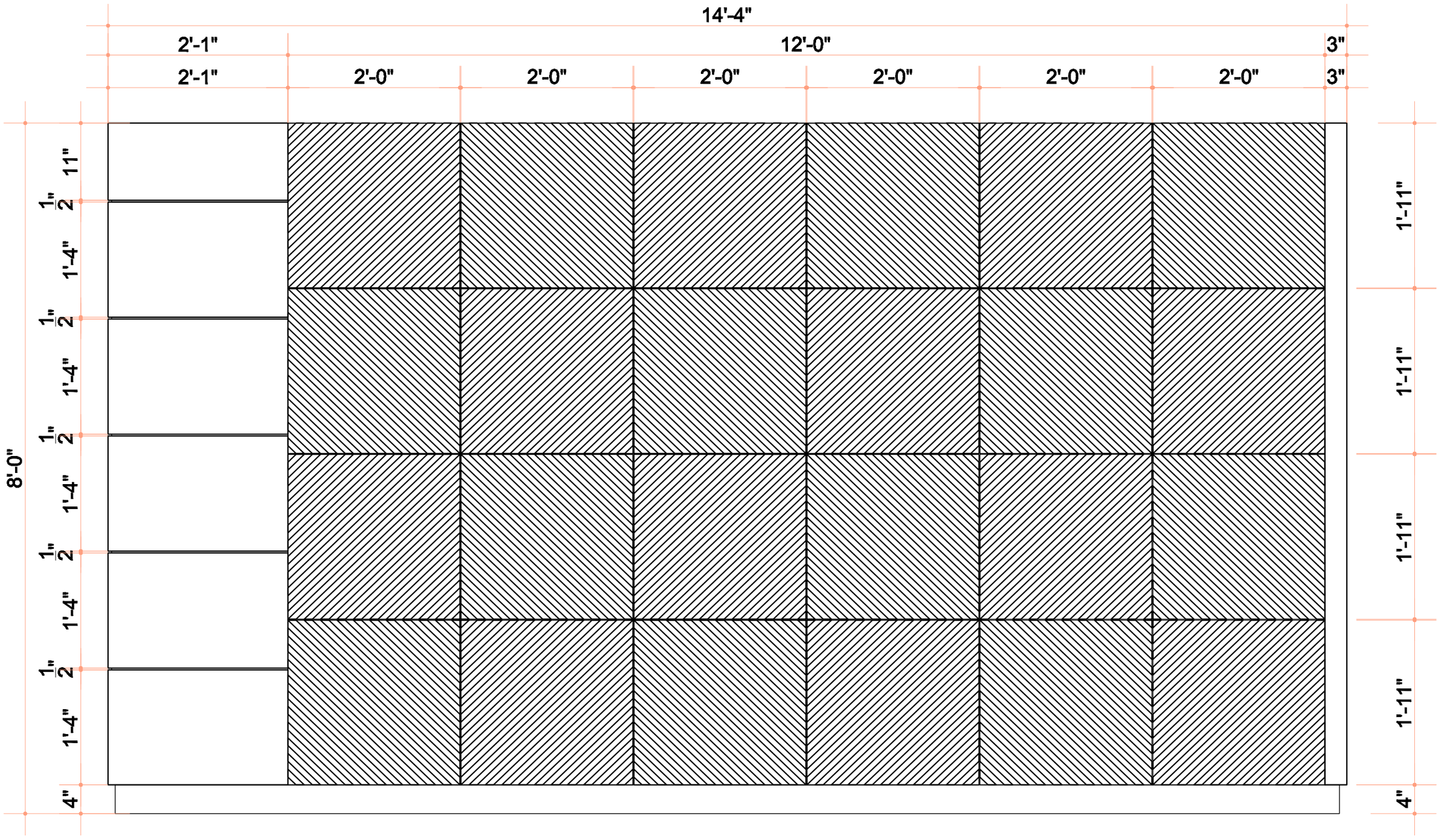
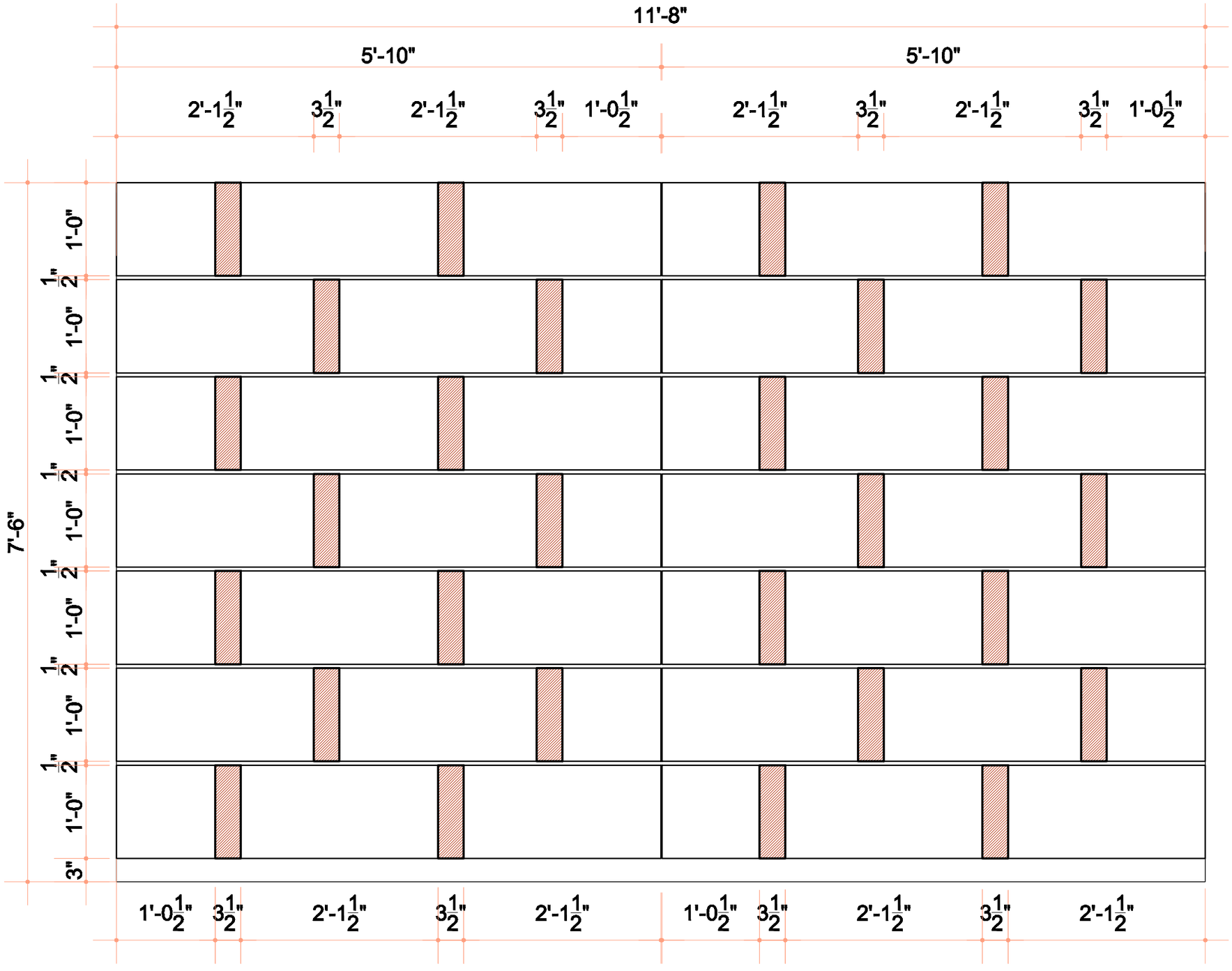


NORTH SIDE RIGHT FACADE



SOUTH SIDE LEFT FACADE



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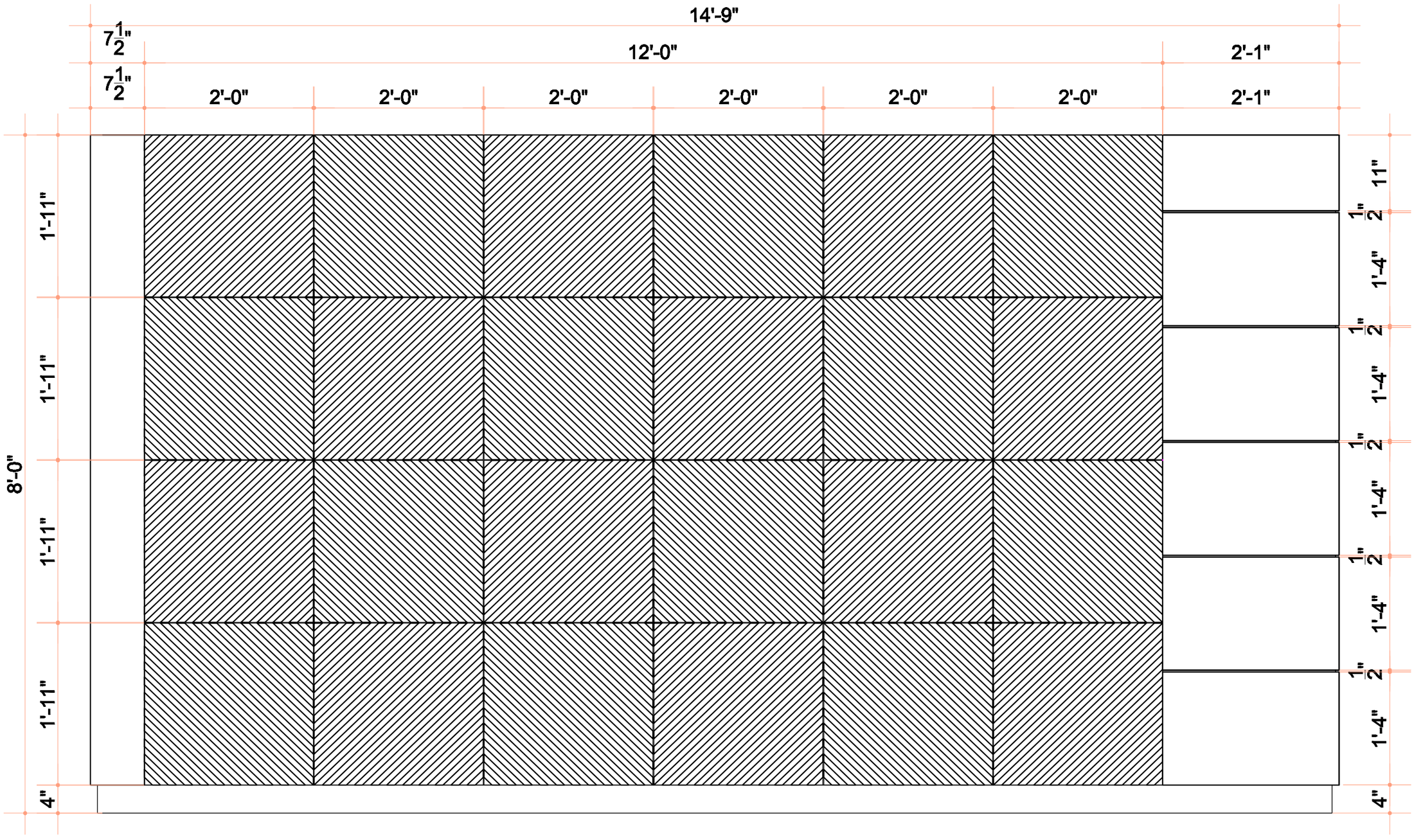
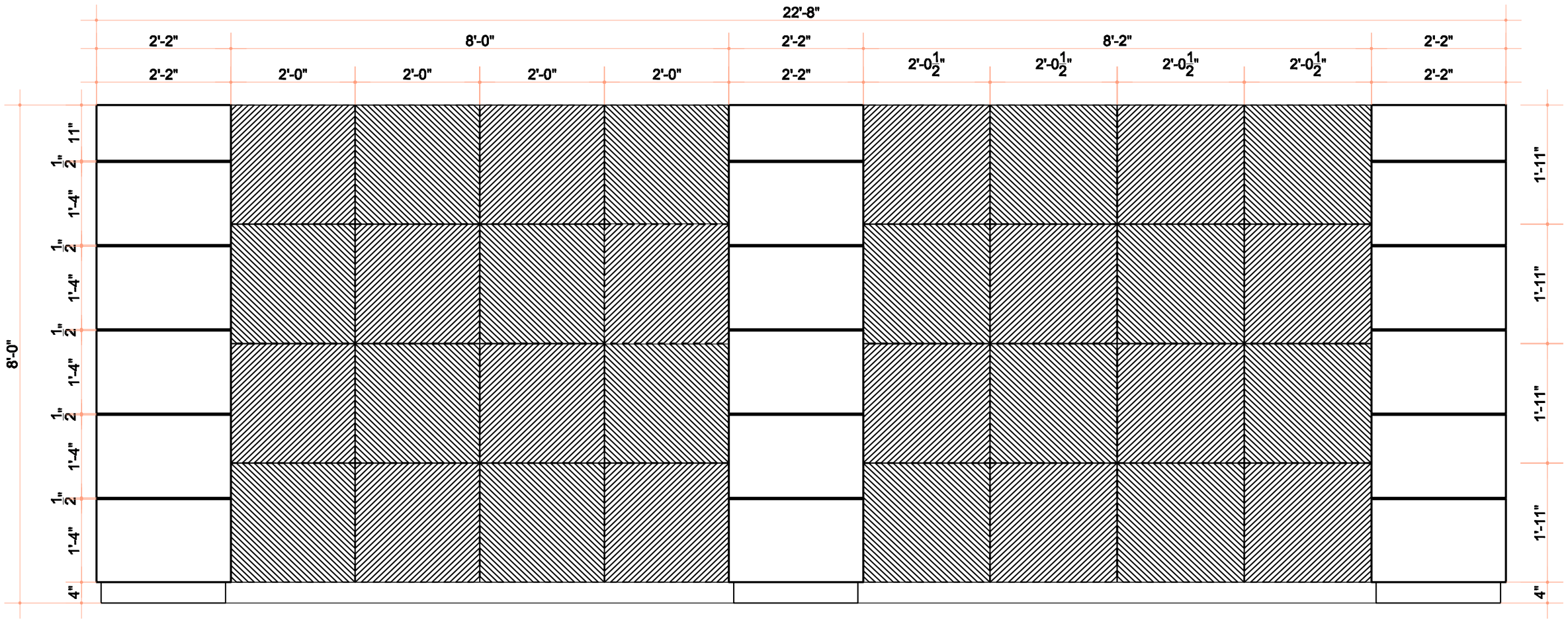
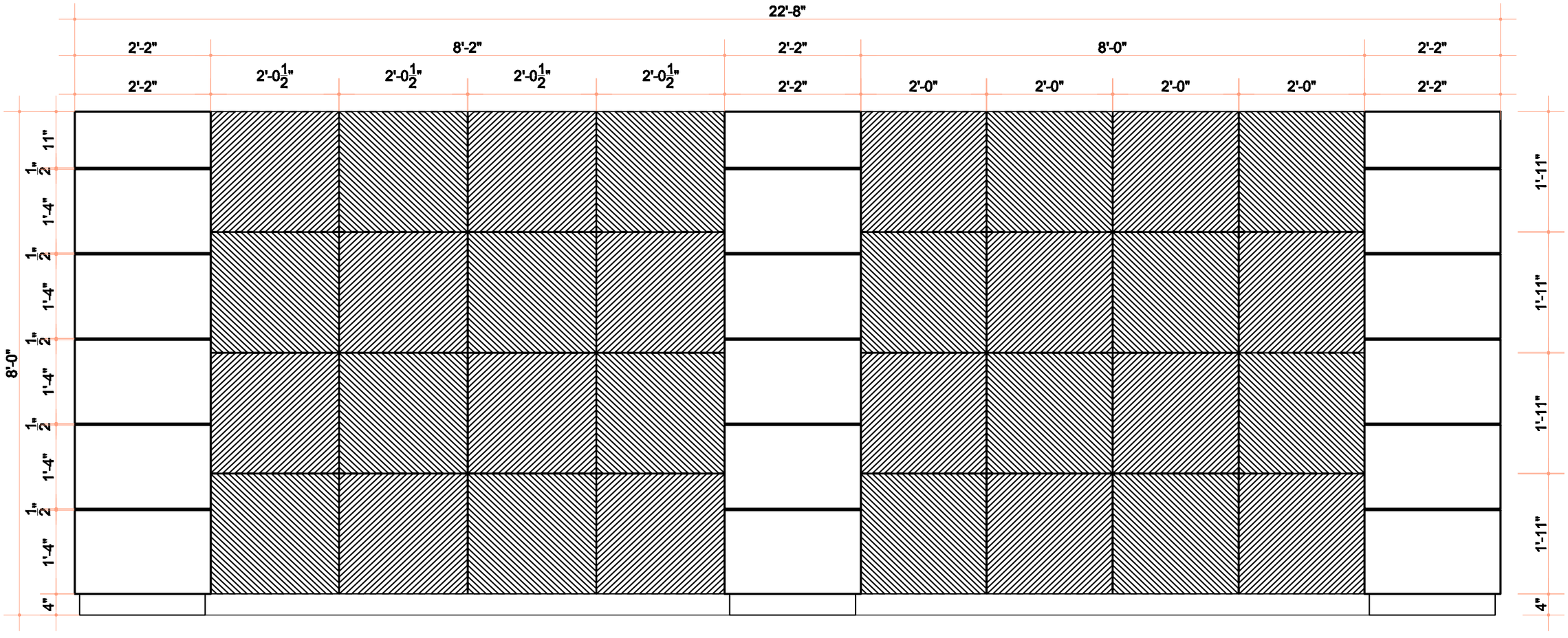


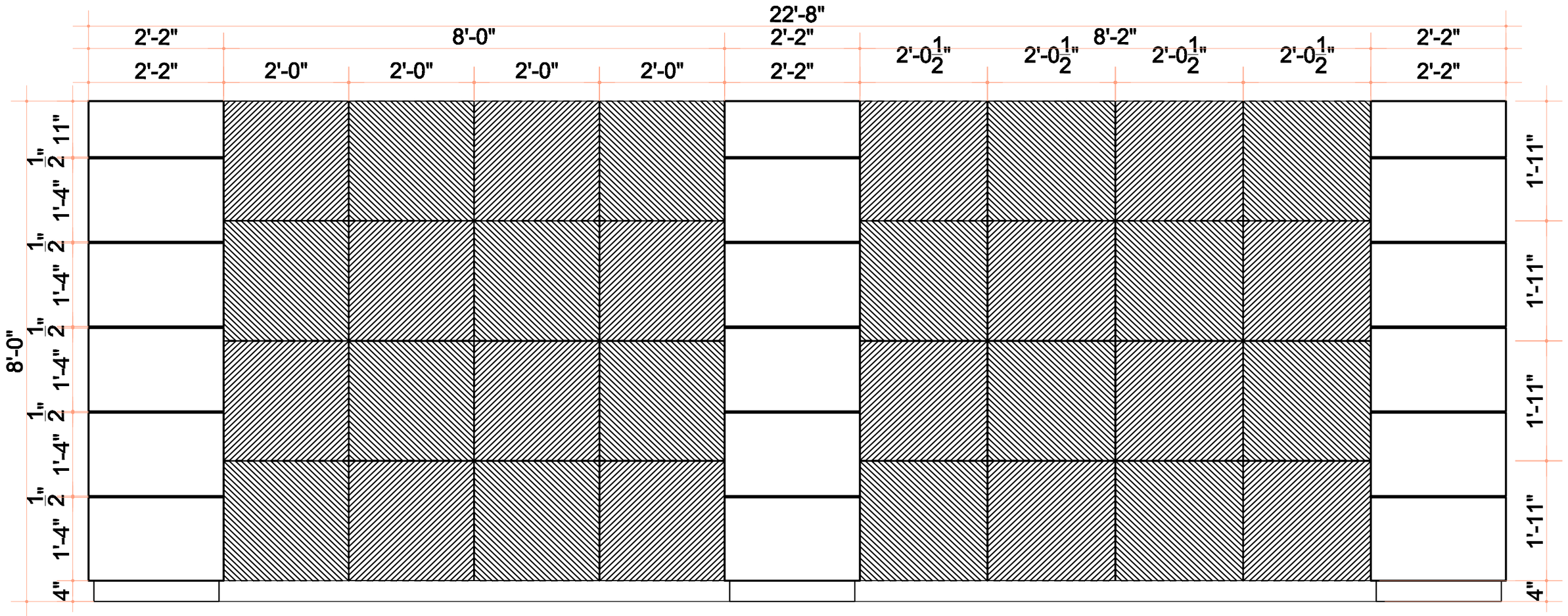
SOUTH SIDE RIGHT FACADE



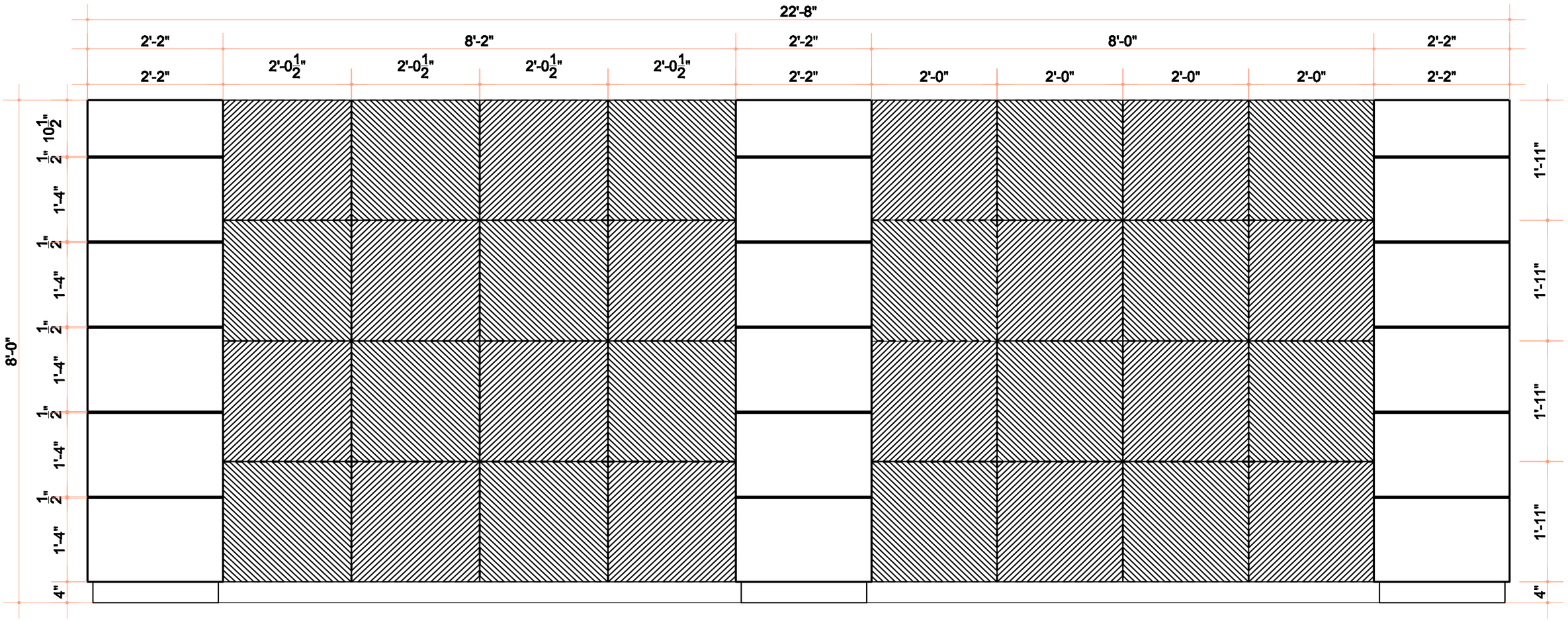
EAST SIDE LEFT FACADE



EAST SIDE RIGHT FACADE

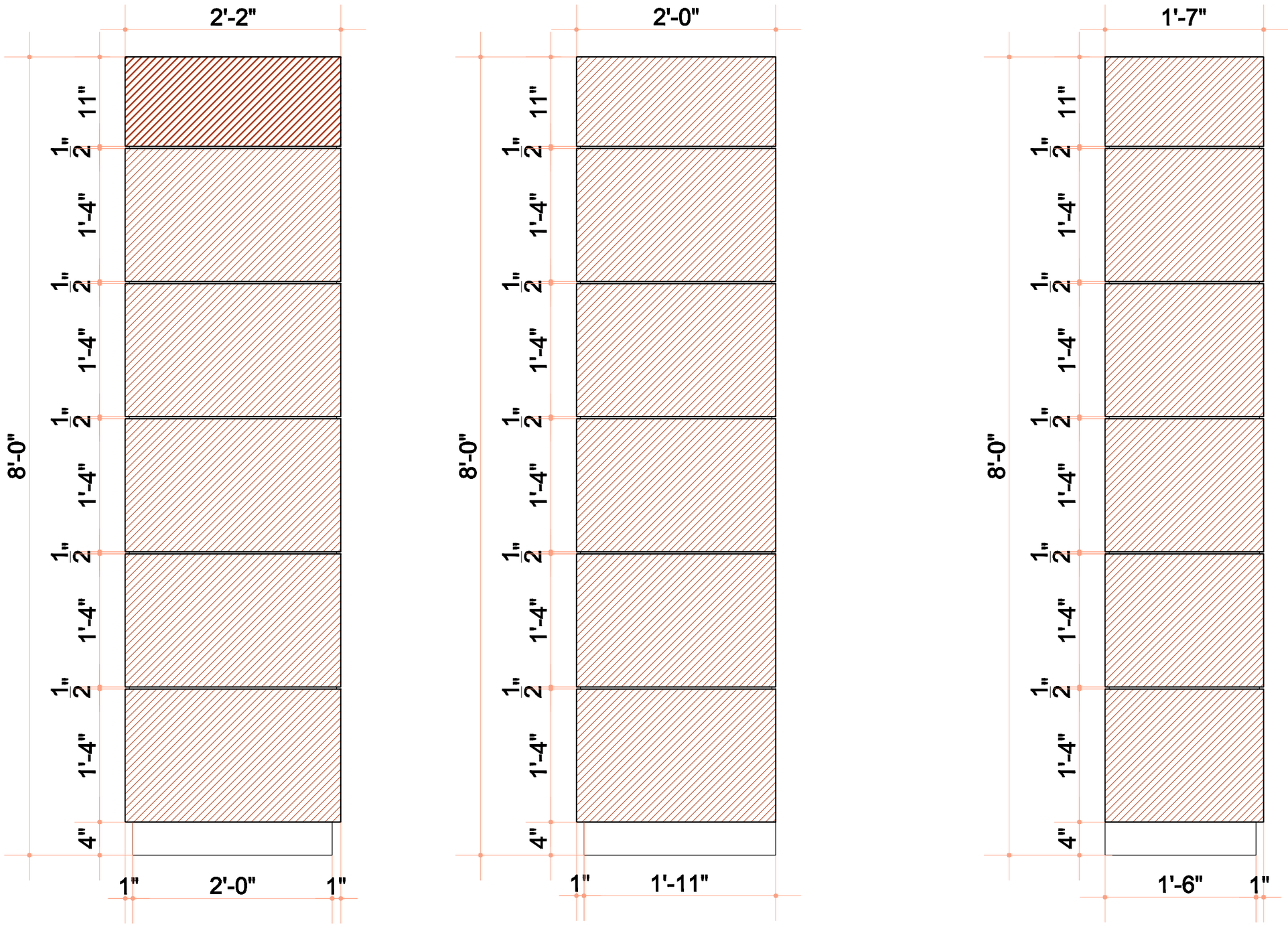


WEST SIDE LEFT FACADE

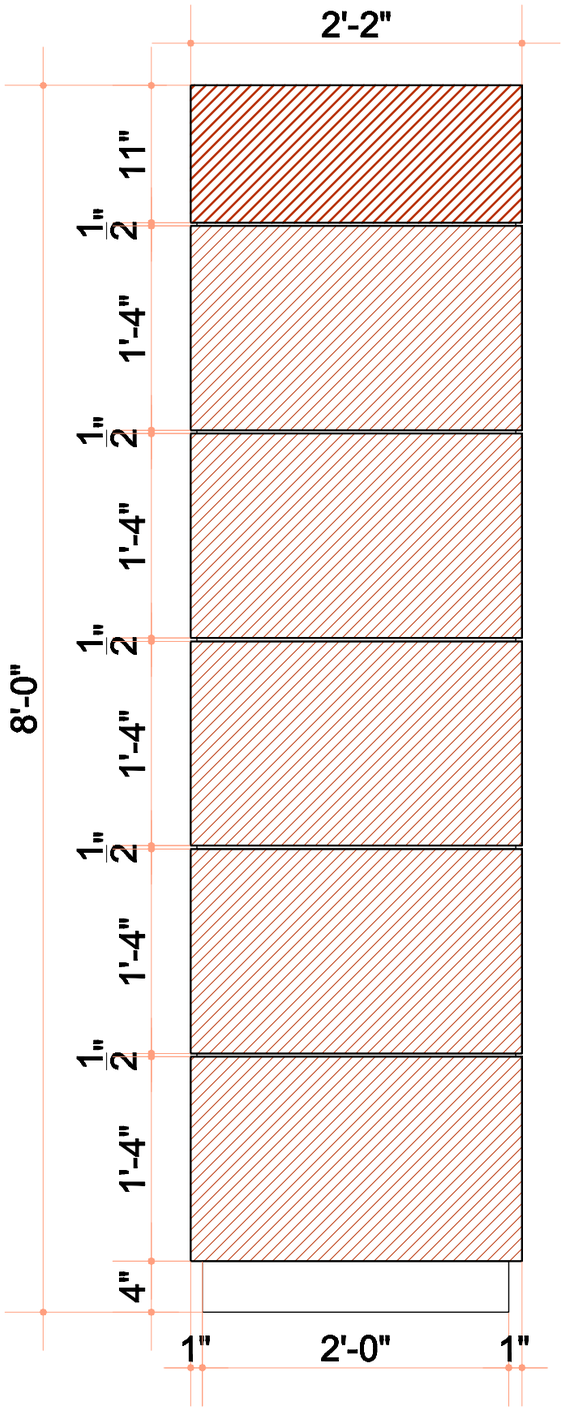


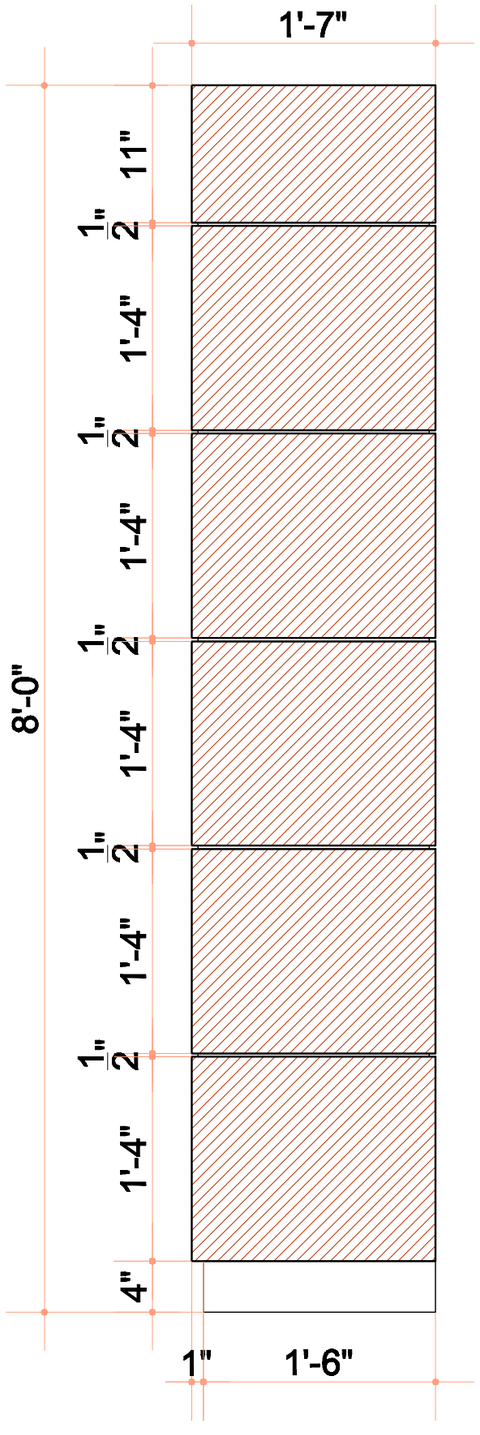
WEST SIDE RIGHT FACADE

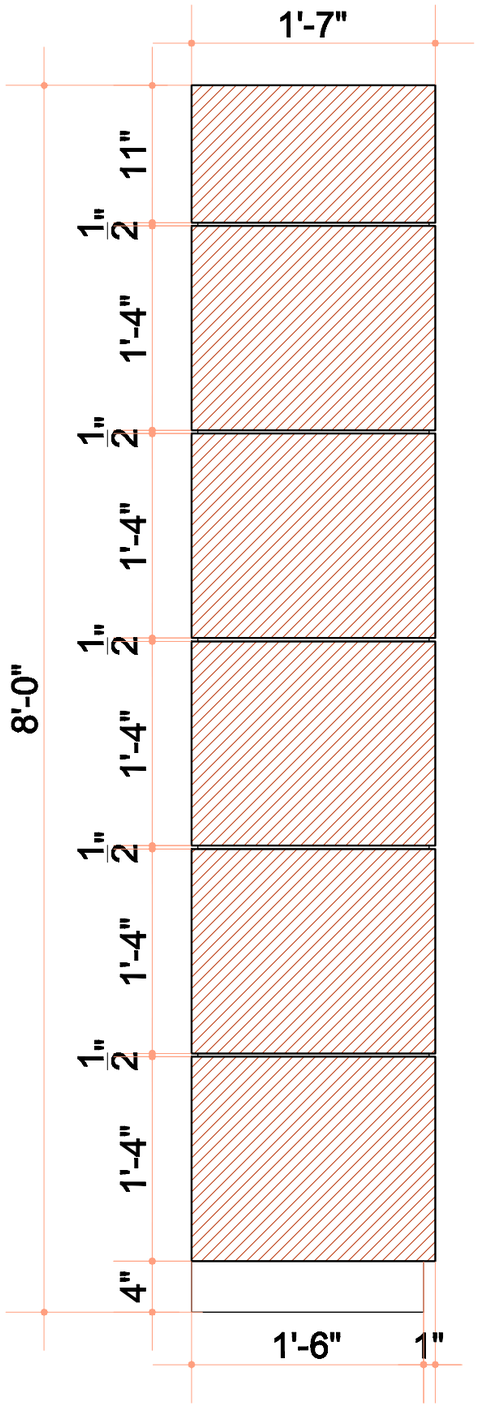
COLUMN (TYPE-3) ELEVATION



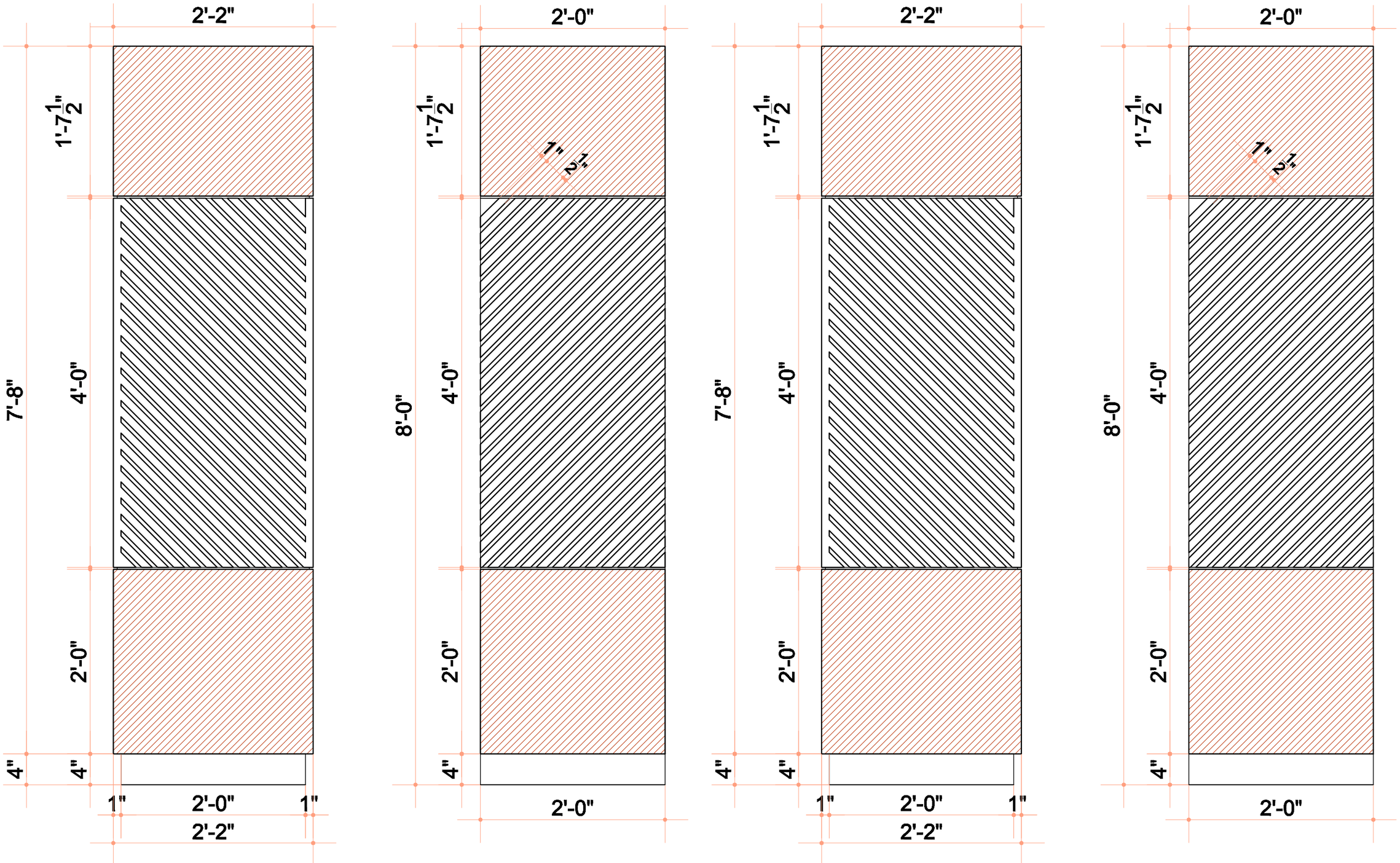
COLUMN (TYPE-2) ELEVATION

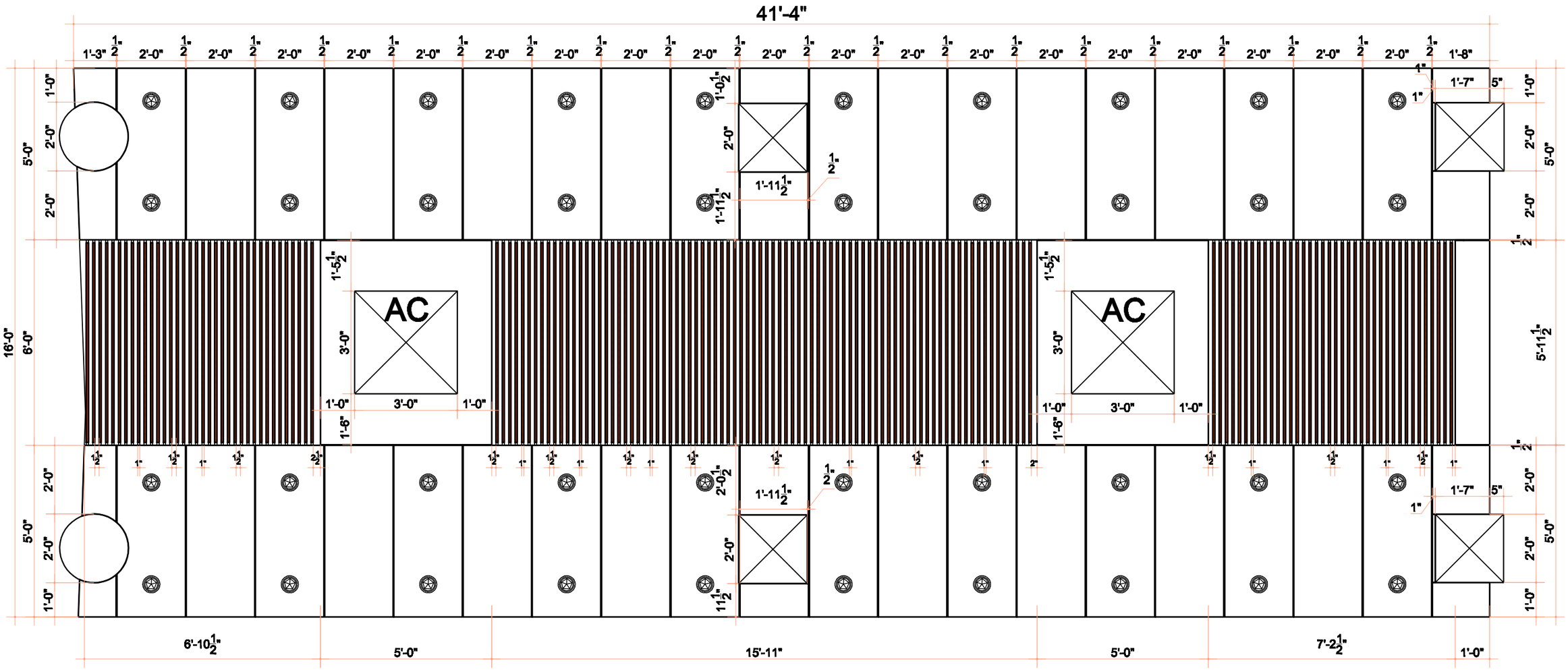




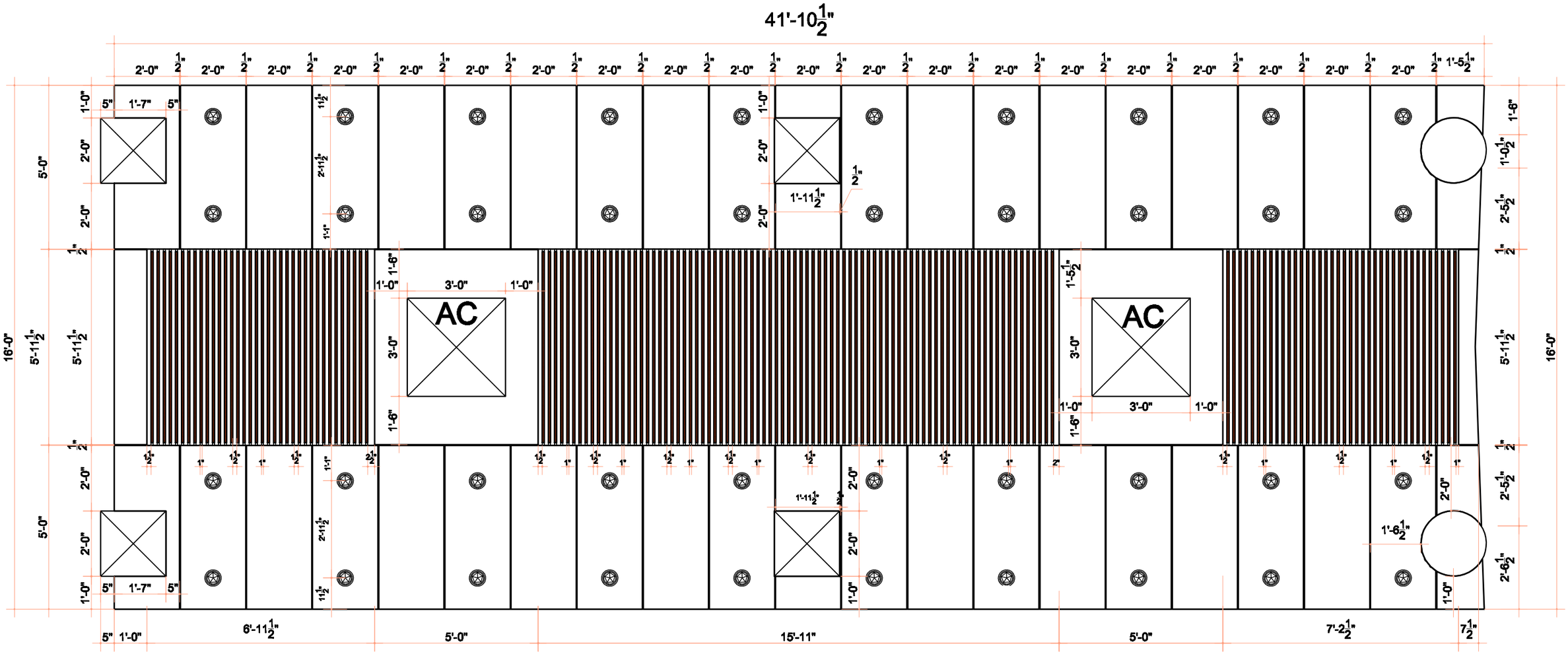


COLUMN (TYPE-1) ELEVATION

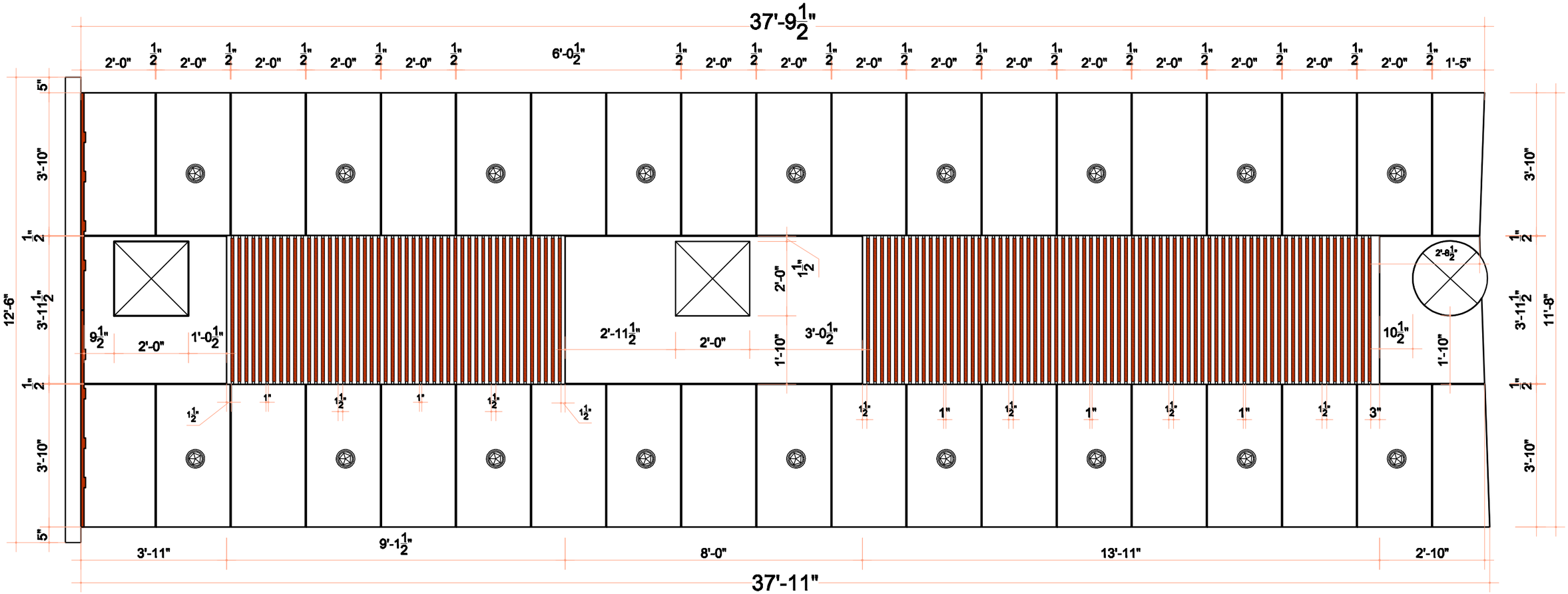




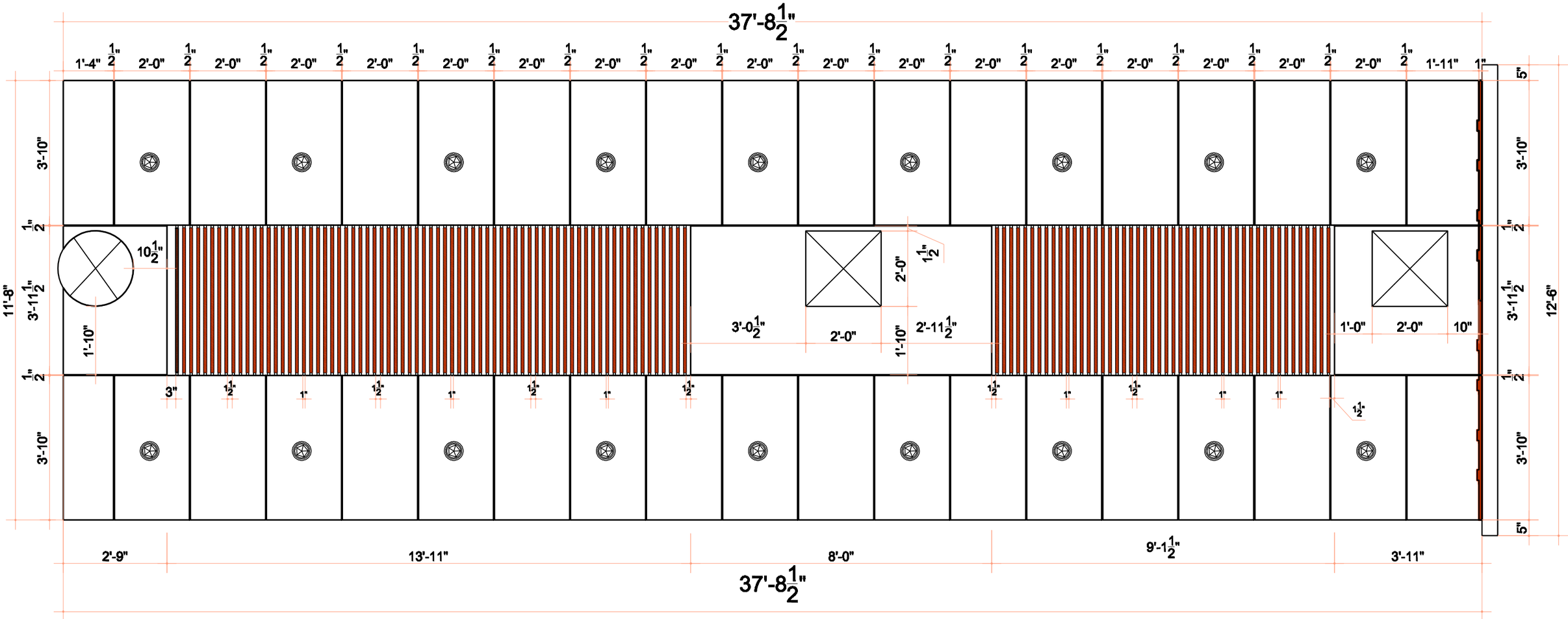
West side Ceiling



East side Ceiling



North side Ceiling



South side Ceiling

LIST OF DRAWING	
DWG NO.	**DESCRIPTIONS**
HVAC–00	**COVER PAGE**
HVAC–01	**LIST OF DRAWINGS, NOTES, SYMBOLS & ABBREVIATIONS**
HVAC–02	**HVAC PIPING SCHEMATIC DRAWING**
HVAC–03	HVAC CHILLER PLANT ROOM
HVAC–04	**HVAC LAYOUT DRAWING – GROUND FLOOR**
HVAC–05	**HVAC LAYOUT DRAWING – 1st FLOOR**
HVAC–06	HVAC LAYOUT DRAWING – 2nd FLOOR
HVAC–07	HVAC LAYOUT DRAWING – 3rd FLOOR
HVAC–08	**HVAC ELECTRICAL SCHEMATIC DRAWING SHEET 1**
HVAC–09	HVAC ELECTRICAL SCHEMATIC DRAWING SHEET 2
HVAC–10	HVAC ELECTRICAL SCHEMATIC DRAWING SHEET 3
HVAC–11	**HVAC DRAWING STANDARD DETAIL SHEET 1**
HVAC–12	**HVAC DRAWING STANDARD DETAIL SHEET 2**
HVAC–13	HVAC DRAWING STANDARD DETAIL SHEET 3

ABBREVIATIONS	
SYMBOL	DESCRIPTIONS
CHWP	CHILLED WATER PUMP
FCU	FAN COIL UNIT
FCU(D)	FCU–CEILING CONCEALED DUCT TYPE
FCU(CA)	FCU–CEILING CASSETTE TYPE
FCU(FA)	FCU–FRESH AIR INTAKE TYPE
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
VCD	VOLUME CONTROL DAMPER
RG	RETURN GRILLE
SD	SUPPLY DIFFUSER
VRF	VARIABLE REFRIGERANT FLOW
AD	ACCESS DOOR (MINIMUM: 450x450MM)
L/s	LITTER PER SECOND
EAF	EXHAUST AIR FAN
FAF	FRESH AIR FAN
RAG	RETURN AIR GRILLE
ARP	AUTO REFILL PUMP
DUC	DOOR UNDER CUT
SAF(D)	SUPPLY AIR FAN DUCT–IN–LINE
KSF	KITCHEN SUPPLY FAN
KEF	KITCHEN EXHAUST FAN
EAF(D)	EXHAUST AIR FAN DUCT–IN–LINE
EAF(P)	EXHAUST AIR FAN PROPELLER TYPE
CDP	CHEMICAL DOSING POT

ABBREVIATIONS	
SYMBOL	DESCRIPTIONS
EFB	EXHAUST FAN WITH BUILT–IN EXHAUST GRILLE
RG	RETURN GRILLE
IU	INDOOR UNIT
FD	FIRE DAMPER
FAHU	FRESH AIR AHU

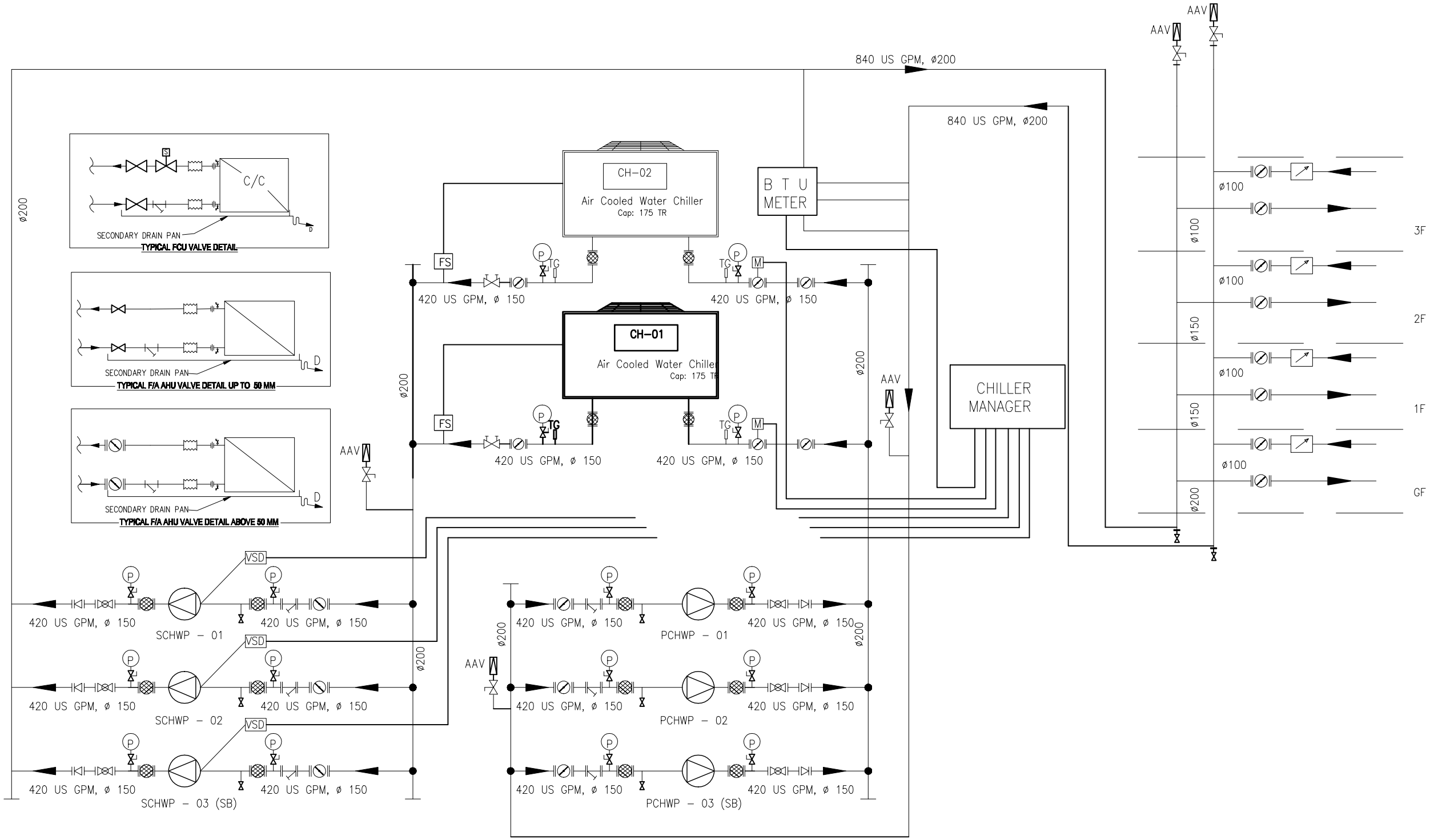
LEGENDS WATER SIDE	
SYMBOLS	DESCRIPTIONS
	GATE VALVE
	BALL VALVE
	GLOBE VALVE
	BUTTERFLY VALVE
	CHECK VALVE (NON–RETURN)
	FLOW BALANCING VALVE–STAT VALVE
	DYNAMIC FLOW BALANCING VALVE
M	MOTORISED 2–WAY VALVE
M	MOTORISED 3–WAY VALVE
	Y–STRAINER
	FLEXIBLE PIPING CONNECTION
T	THERMOMETER WELL
	UNIVERSAL TEST POINT
FS	FLOW SWITCH
FM	WATER FLOW METER
T	DIAL TEMPERATURE GAUGE
AAV	AUTOMATIC AIR VENT
	DRAIN C/W TRAP
CDP	CONDENSATE DRAIN PUMP
PG	PRESSURE GAUGE

LEGENDS AIR SIDE	
SYMBOL	**DESCRIPTIONS**
	VOLUME CONTROL DAMPER
	FCU(CA)
	MULTIBOX/BOX TYPE FAN
	FCU (CEILING CONCEALED TYPE)
	CIRCULAR DUCT MOUNTED FAN
	PROPELLER TYPE FAN (SMALLER SIZE)
	CIRCULAR DUCT MOUNTED TOILET EXHAUST FAN
	FRESH AIR DUCT
	EXHAUST AIR DUCT
	SUPPLY AIR DUCT
	REFRIGERANT PIPE
	AC DRAIN PIPE
	CHILLED WATER PIPE
	CHILLED WATER PIPE
	NECK DAMPER
	DOOR UNDER CUT
	ROUND TO RECTANGULAR TRANSFORMER
	AXIAL TYPE EXHAUST FAN
SD	SMOKE DETECTOR
	SPLIT TYPE OUT DOOR UNIT
	SPLIT TYPE IN DOOR UNIT
	EFB
EXP	EXPANSION TANK
	SUPPLY AIR GRILLE
	EXHAUST AIR GRILLE
	FRESH AIR LOUVER
	EXHAUST AIR LOUVER

Notes:

1. All dimensions shown in drawing are in mm if otherwise not mentioned.
2. Verify measurement at site, prepare Shop drawing and get approval.
3. Coordinate with other services for accommodation and reflect it in Shop drawing.
4. Coordinate with interior design for location of Thermostat, Air Terminals, Access Door.
5. Check Partition wall whether extended to main ceiling or not.
6. Check space above false ceiling is conditioned or non–conditioned.
7. False ceiling of conditioned area must be partitioned from Toilet/Non conditioned area.
8. Verify demarkation of Scope of work of related vendor(s) at all junction points.
9. In case of Duct internal lining, dimensions mentioned are of clear internal size.
10. Use Split Damper in case of all Tee joints in ducting.

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasnuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : LIST OF DRAWINGS, NOTES, SYMBOLS & ABBREVIATIONS	July,2020						01			Sheet No: 01
								02			
								03			
								04			
								05			



CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC PIPING SCHEMATIC DRAWING	July,2020						01			Sheet No: 02
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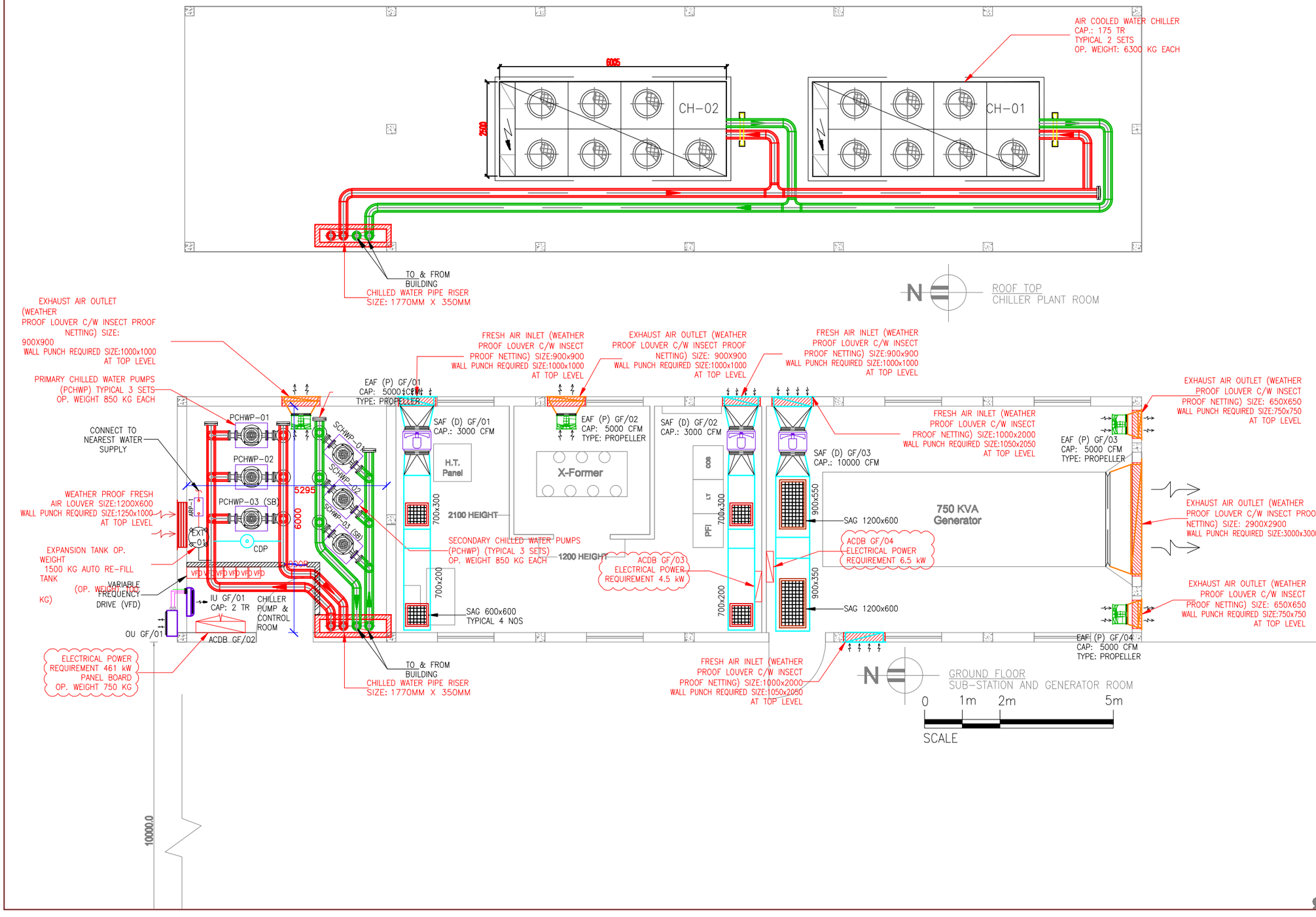

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC CHILLER PLANT ROOM	July,2020						01			Sheet No: 03
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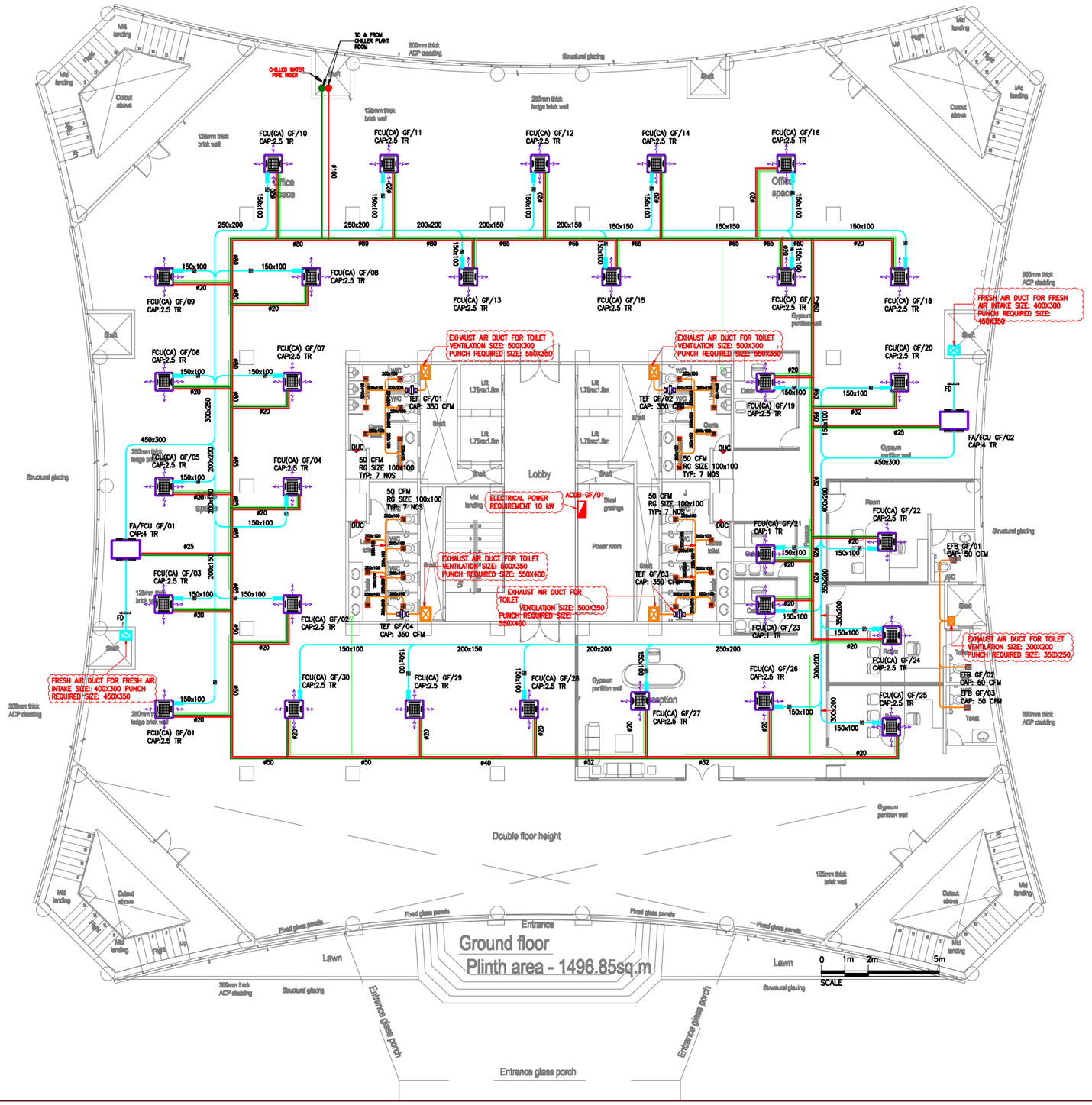

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC LAYOUT DRAWING - GROUND FLOOR	July,2020						01			Sheet No: 04
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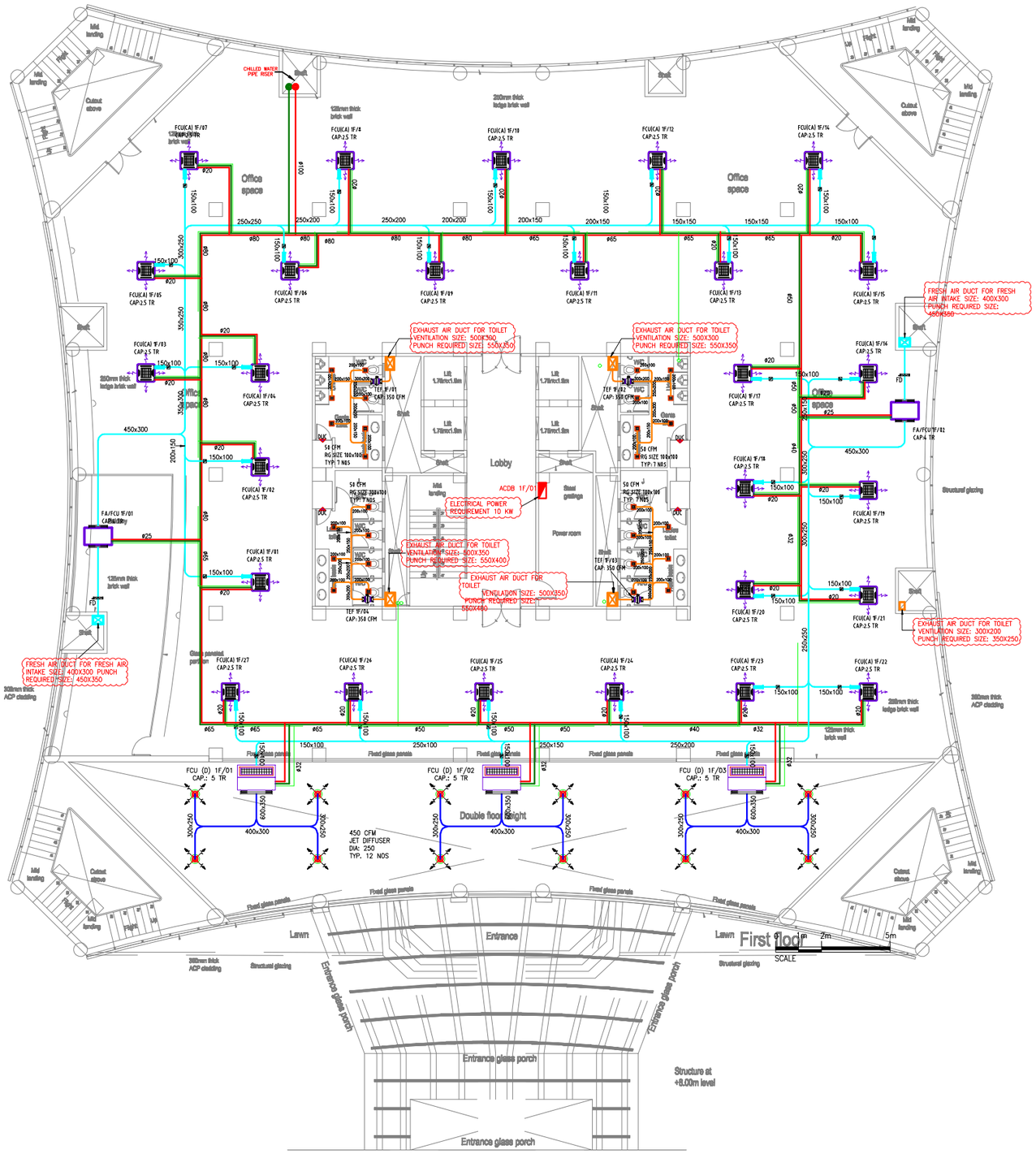

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETB(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC LAYOUT DRAWING - 1ST FLOOR	July,2020						01			Sheet No: 05
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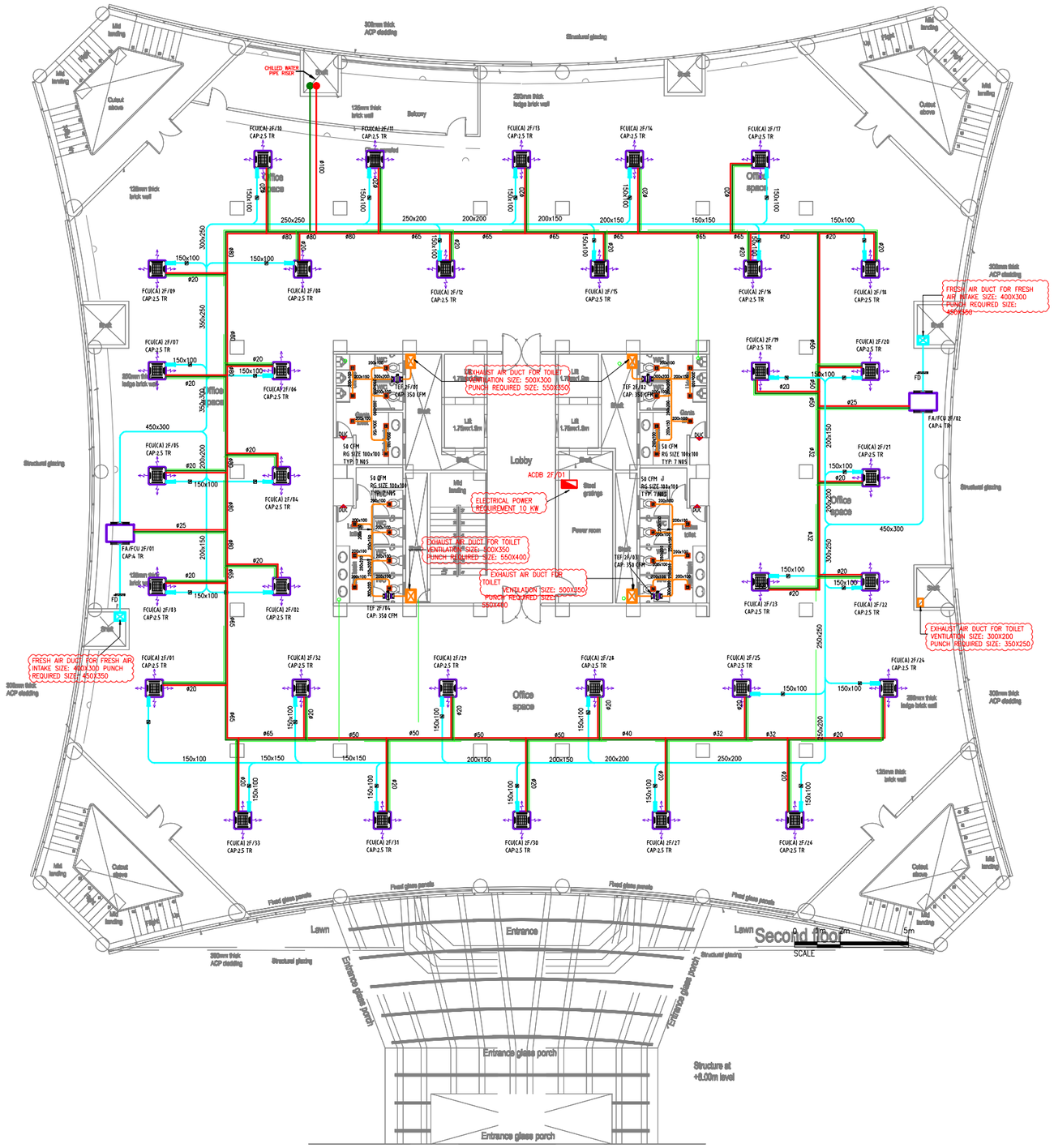

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC LAYOUT DRAWING - 2ND FLOOR	July,2020						01			Sheet No: 06
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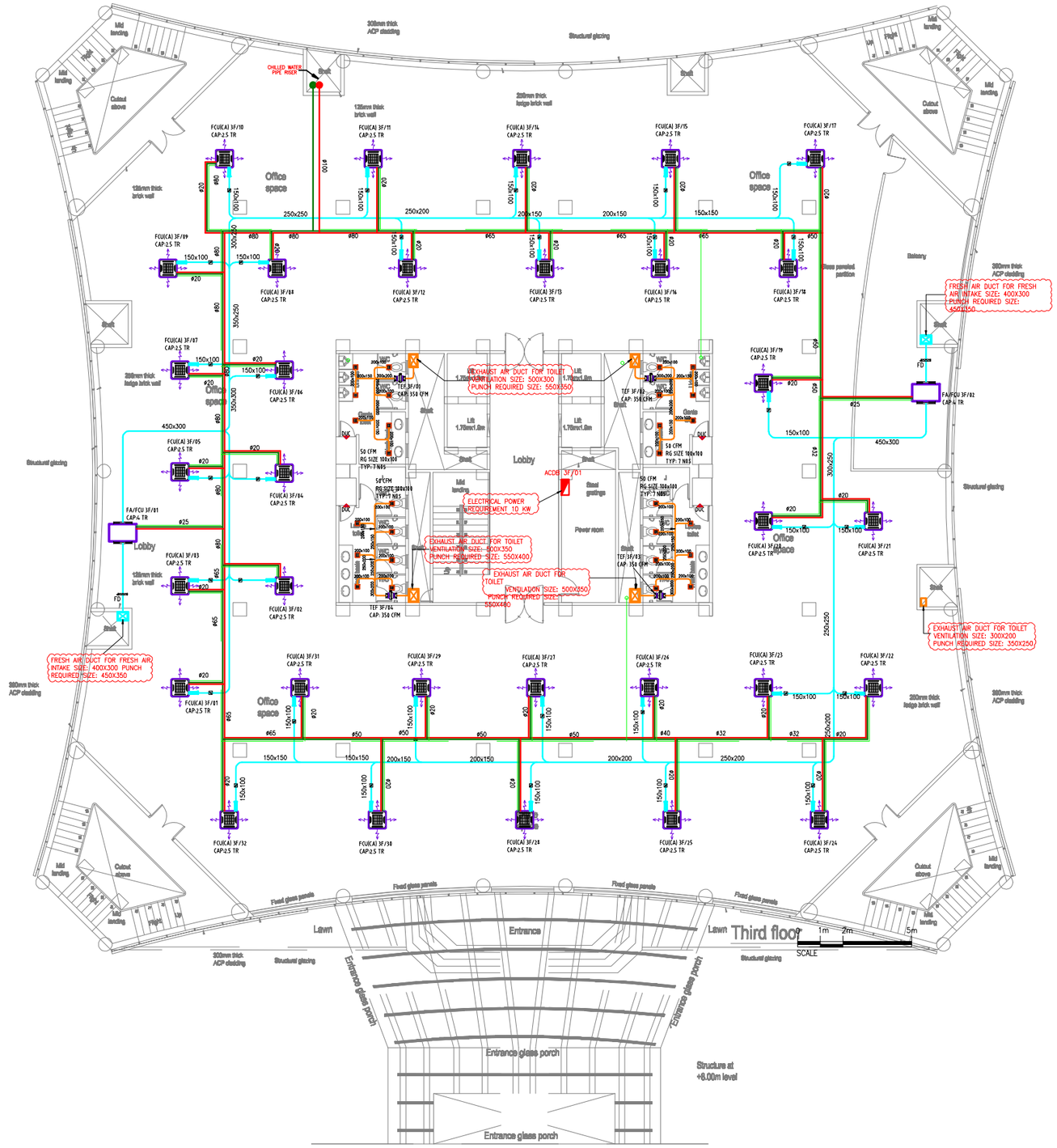

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC LAYOUT DRAWING - 3RD FLOOR	July,2020						01			Sheet No: 07
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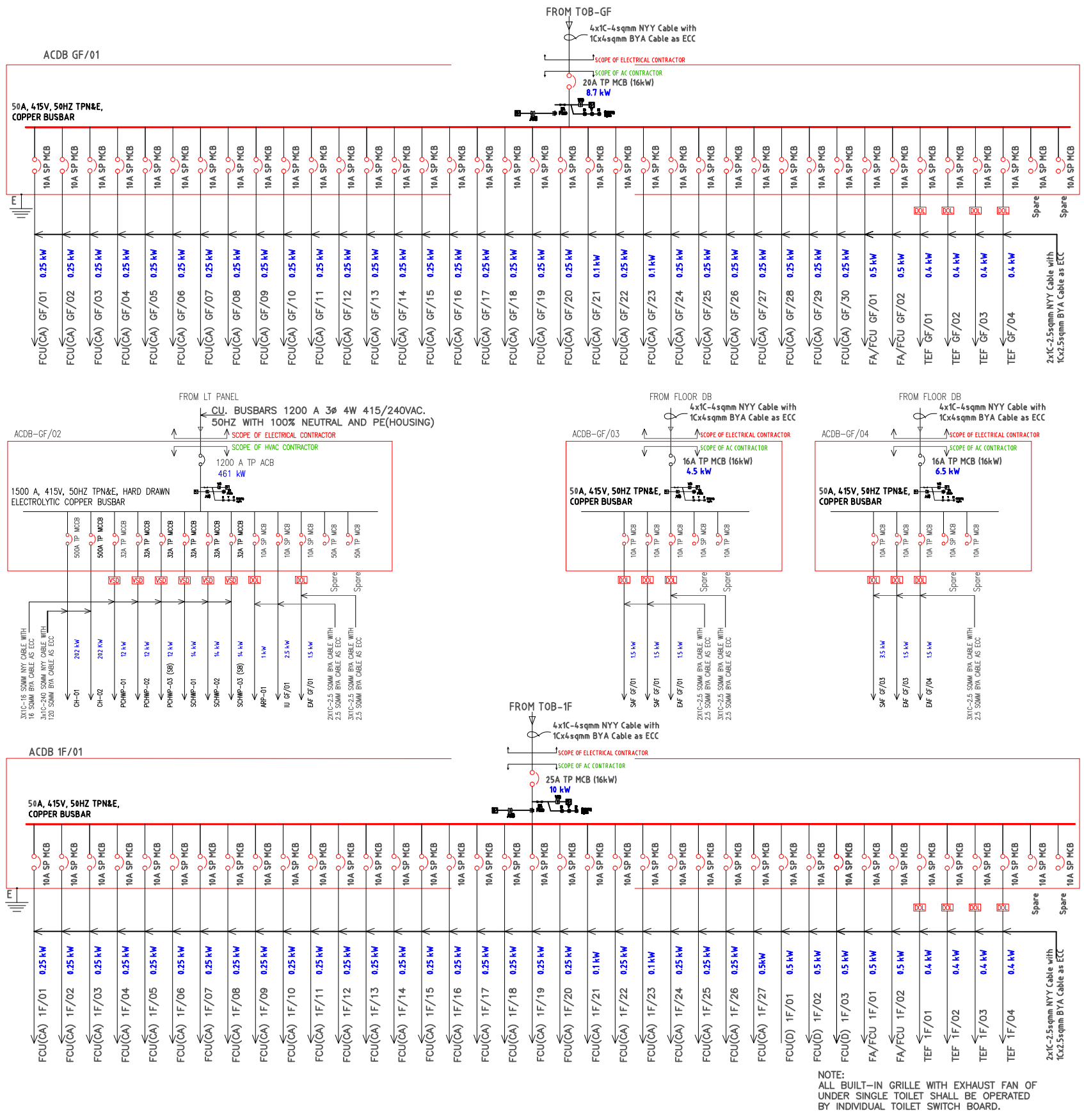

NOTE:
ALL BUILT-IN GRILLE WITH EXHAUST FAN OF UNDER SINGLE TOILET SHALL BE OPERATED BY INDIVIDUAL TOILET SWITCH BOARD.

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETB(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC ELECTRICAL SCHEMATIC DRAWING SHEET 2	July,2020						01			Sheet No: 08
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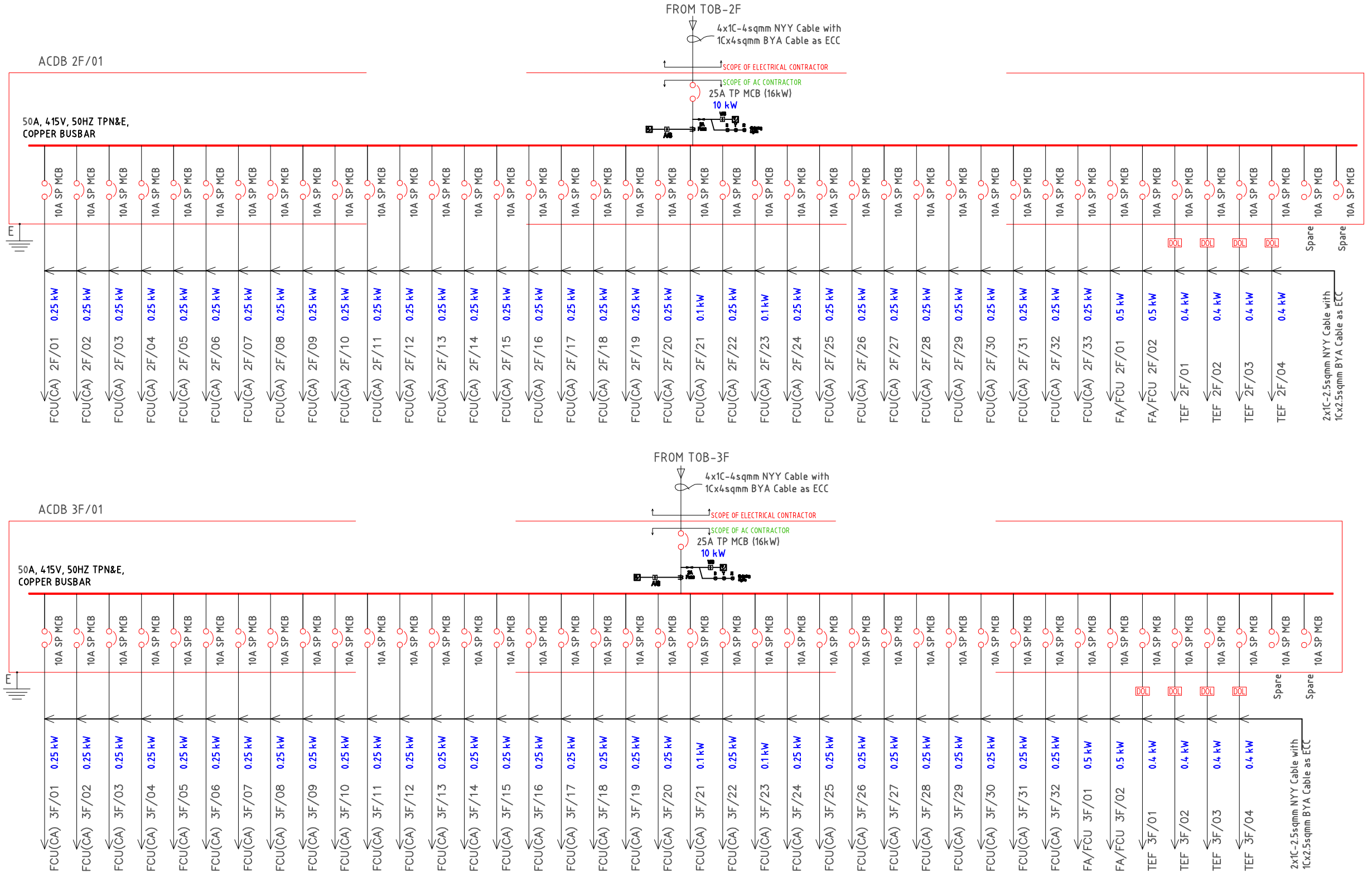

NOTE:
ALL BUILT–IN GRILLE WITH EXHAUST FAN OF UNDER SINGLE TOILET SHALL BE OPERATED BY INDIVIDUAL TOILET SWITCH BOARD.

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC ELECTRICAL SCHEMATIC DRAWING SHEET 1	July,2020						01			Sheet No: 09
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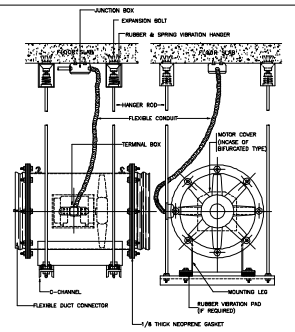
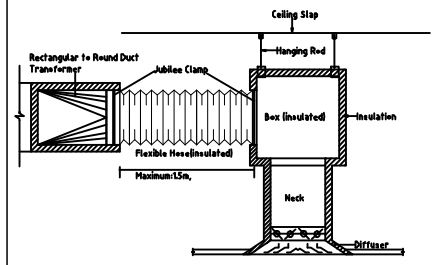
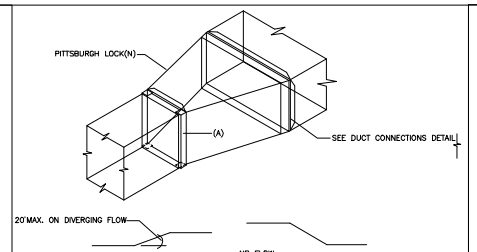


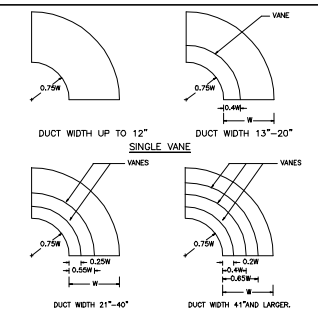
AXIAL FAN DIRECT DRIVE (ADJUSTABLE PITCH TYPE)



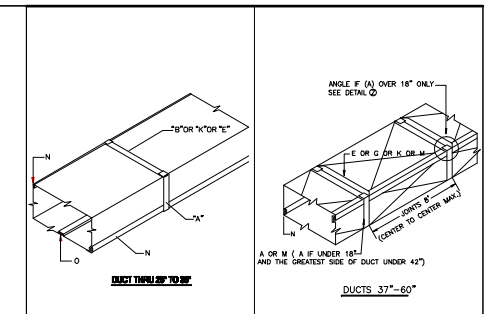
RECTANGULAR DUCT CONSTRUCTION STANDARD



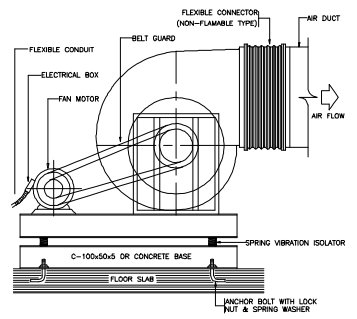
TAPERS-OFF SETS DETAILS



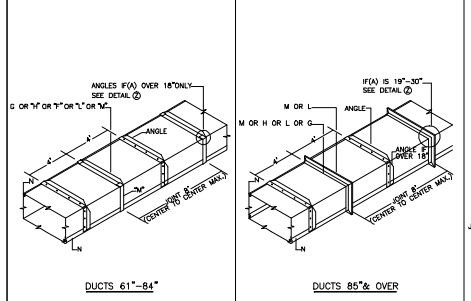
RADIUS ELBOW TURNING VANE



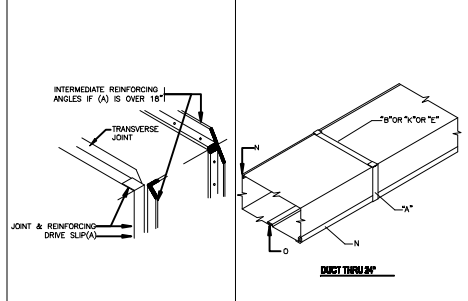
DUCTS 19" THRU 30" , 31"THRU 60" DETAIL



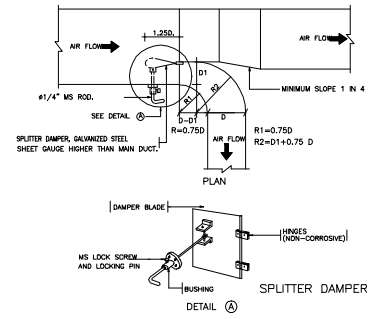
CENTRIFUGAL FAN FLOOR MOUNTED (BELT DRIVE)



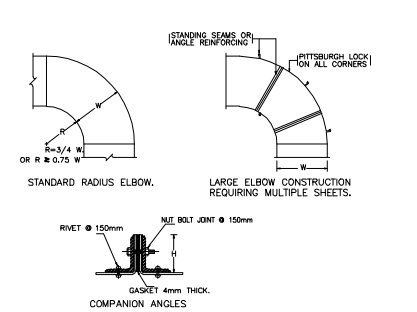
DUCTS 61" THRU 84" , 85"AND OVER DETAIL



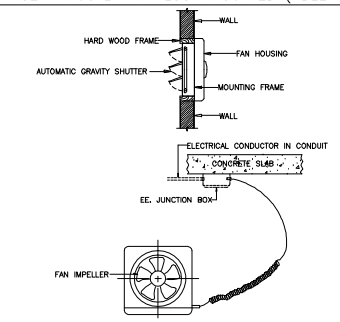
DUCTS THRU 18" DETAIL.



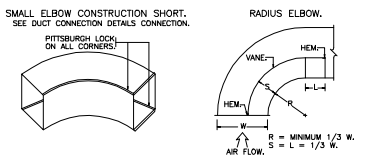
DUCT TEE



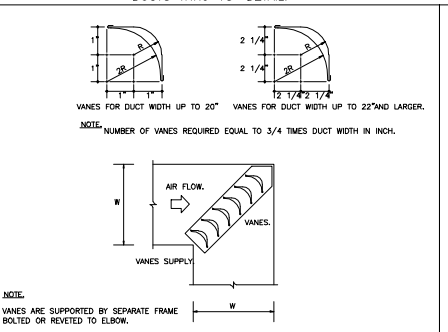
ELBOW CONSTRUCTION.



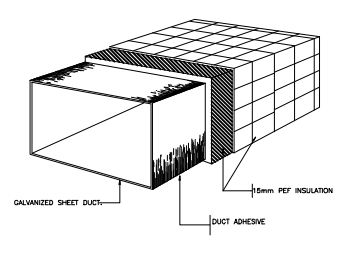
PROPELLER FAN WALL MOUNTED (SMALL SIZE)



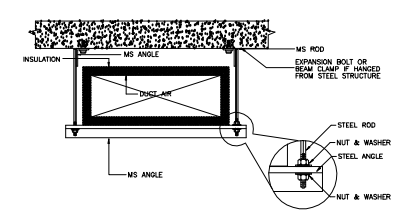
ELBOW CONSTRUCTION.



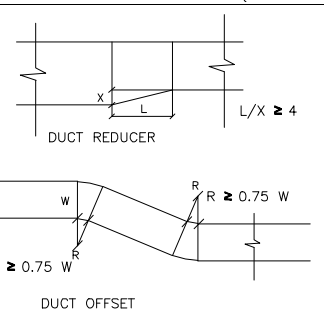
TURNING VANE , SQUARE ELBOW TURNING VANE



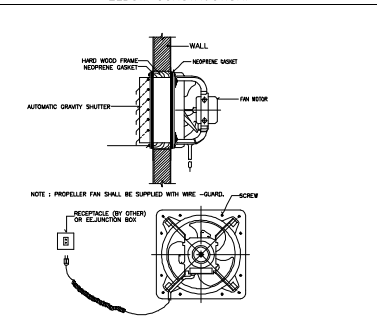
DUCT INSULATION.



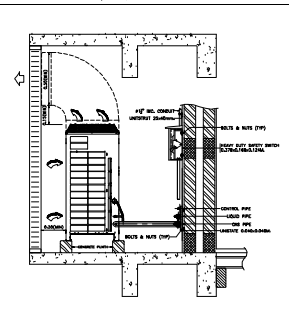
DUCT HANGERS AND SUPPORT DETAIL



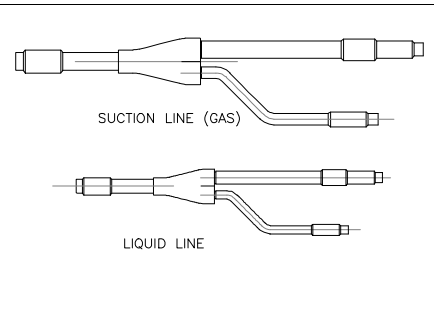
DUCT REDUCER & OFFSET DETAIL



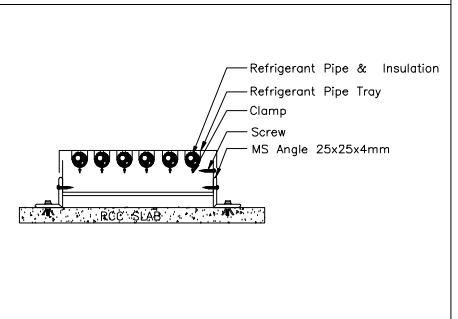
PROPELLER FAN WALL MOUNTED (HP. INDUSTRIAL TYPE)



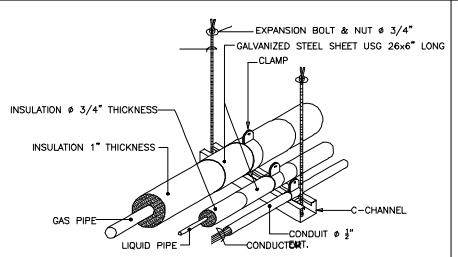
VRF./VRV. CONDENSING UNIT INSTALLATION DETAIL



REFNET REFRIGERANT PIPE FITTING DETAIL



REFRIGERANT PIPE TRAY DETAIL



REFRIGERANT PIPING INSTALLATION DETAIL

APPLICABLE FOR DUCTING , EXTERNAL STATIC PRESSURE 251 Pa TO 500 Pa

DUCT SIZE (mm)	GAUGE NO. (SWG)	FLANGE SIZE (mm)	HANGER SIZE (mm)	THREAD ROD (mm)	ANCHOR BOLT (mm)	Hanger Spacing (m)
UPTO TO 750	24	SLIP JOINT	25x25x3	ø10	ø10	2.5
751 to 1000	22	25x25x3	25x25x3	ø10	ø10	2.5
1001 to 1250	20	32x32x3	32x32x3	ø10	ø10	2.5
1251 to 1800	18	40x40x4.5	40x40x4.5	ø12	ø12	2.5

APPLICABLE FOR DUCTING , EXTERNAL STATIC PRESSURE UPTO 250 Pa

DUCT SIZE (mm)	GAUGE NO. (SWG)	FLANGE SIZE (mm)	HANGER SIZE (mm)	THREAD ROD (mm)	ANCHOR BOLT (mm)	Hanger Spacing (m)
UPTO TO 750	24	SLIP JOINT	25x25x3	ø10	ø10	2.5
751 to 1250	22	25x25x3	25x25x3	ø10	ø10	2.5
1251 to 1500	22	40x40x3	40x40x3	ø10	ø10	2.5

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC DRAWING STANDARD DETAIL SHEET 1	July,2020						01			Sheet No: 10
								02			
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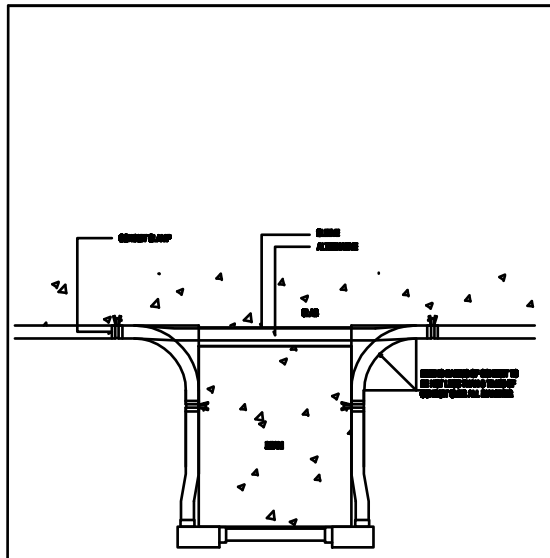
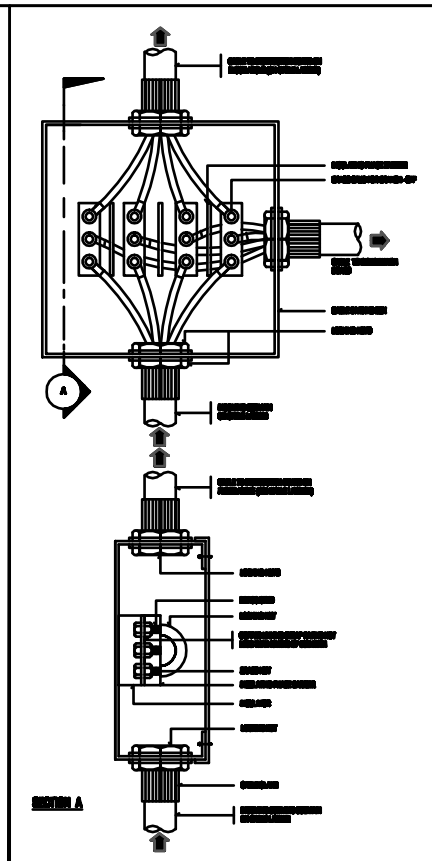
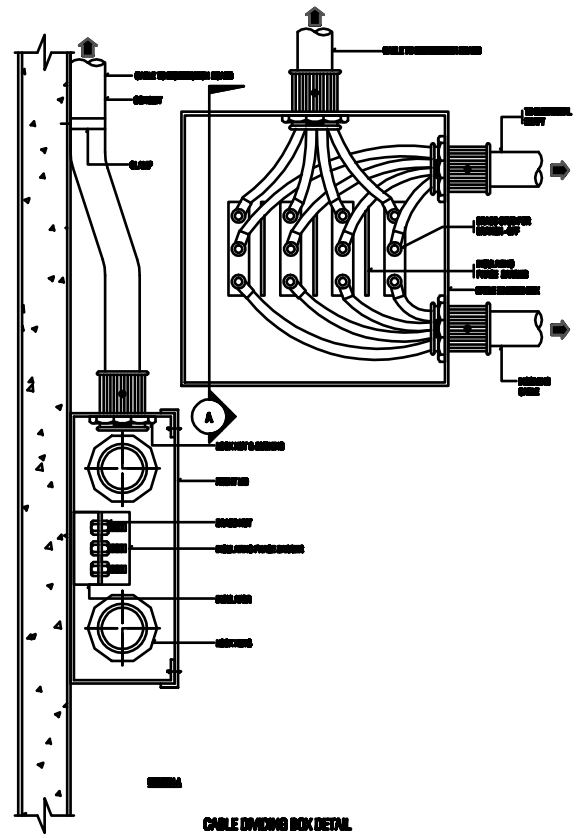


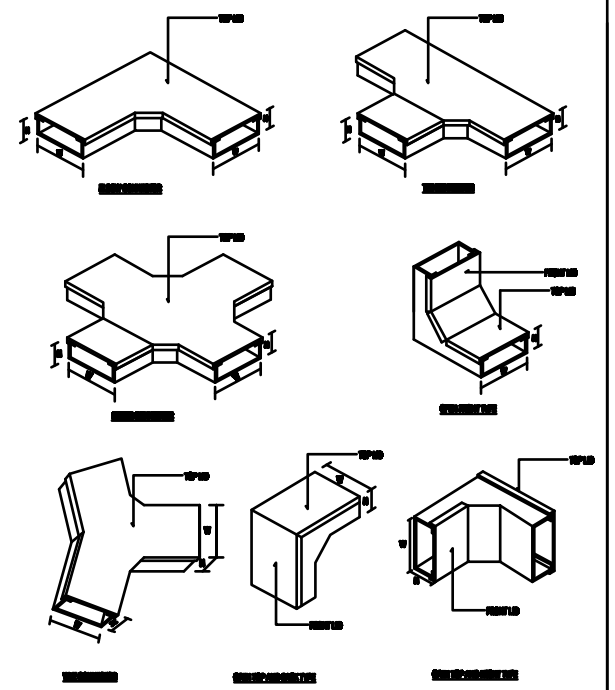
TYPICAL CONDUIT RUN UNDER SIDE OF BEAM



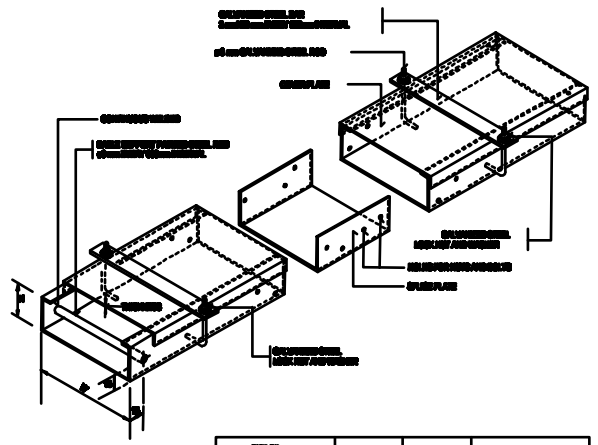
CABLE DIVIDING BOX DETAIL



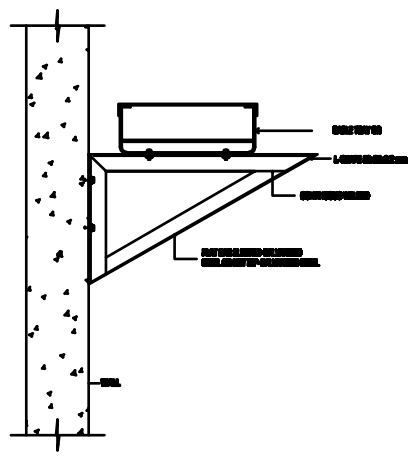
CABLE DIVIDING BOX DETAIL



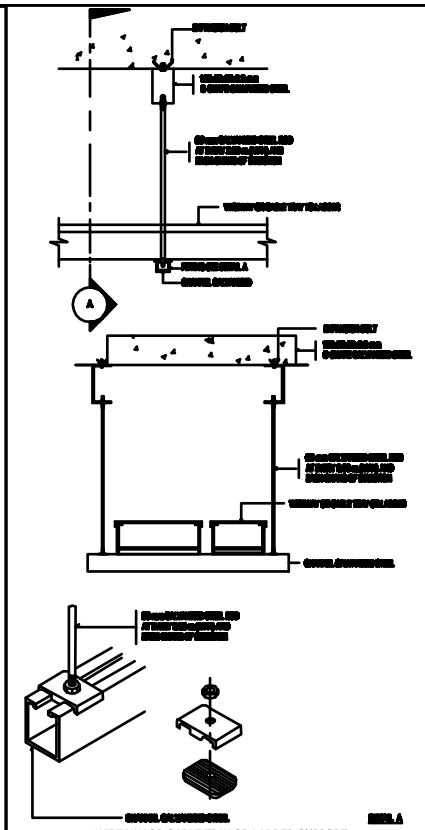
WIREWAY CONNECTOR



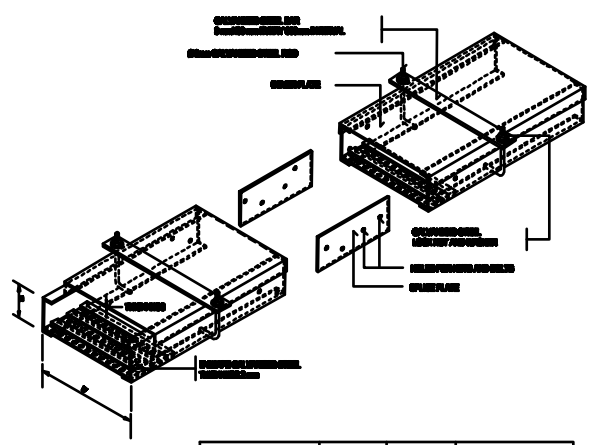
WIREWAY FOR SIZE UP TO 300 X 100 mm



CABLE TRAY OR WIREWAY WALL SUPPORT



WIREWAY OR CABLE TRAY OR LADDER SUPPORT



WIREWAY FOR SIZE UP TO 300 X 100 mm

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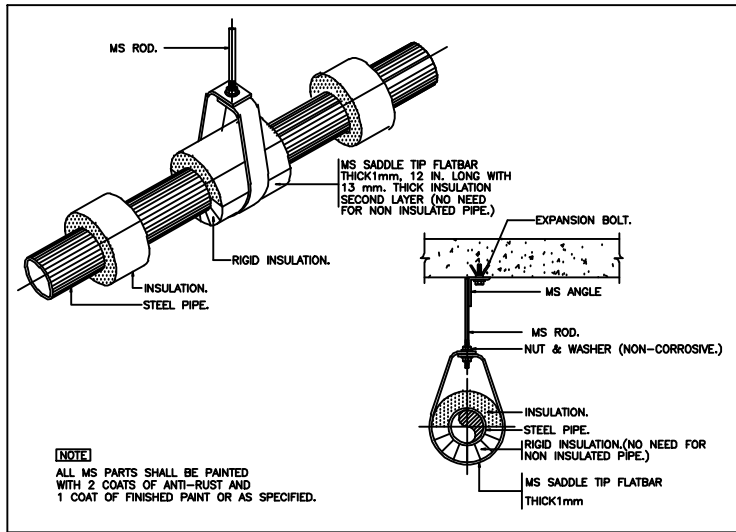
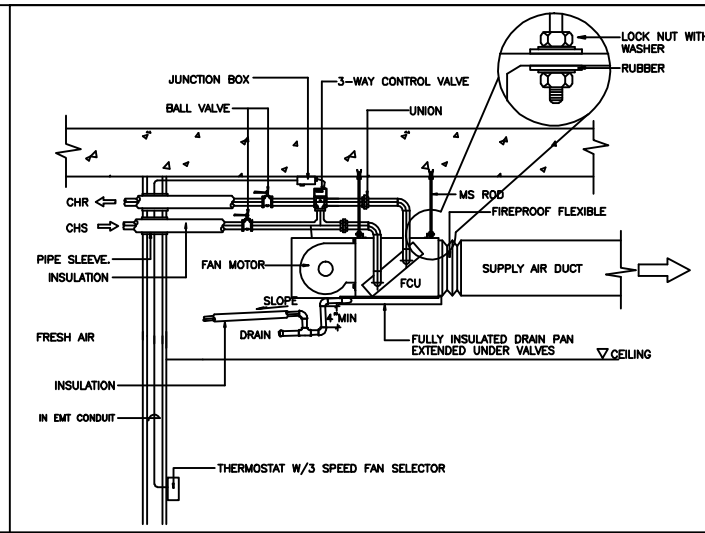
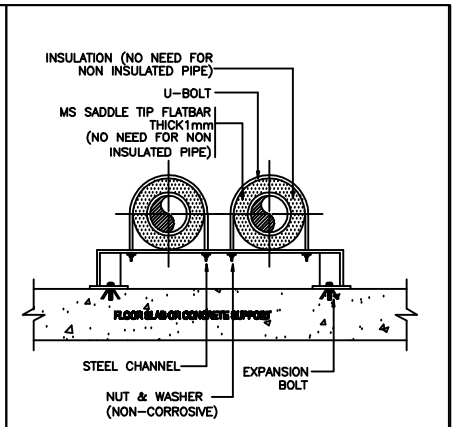
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subasis Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC DRAWING STANDARD DETAIL SHEET 2	July,2020						01 02 03 04 05			Sheet No: 11



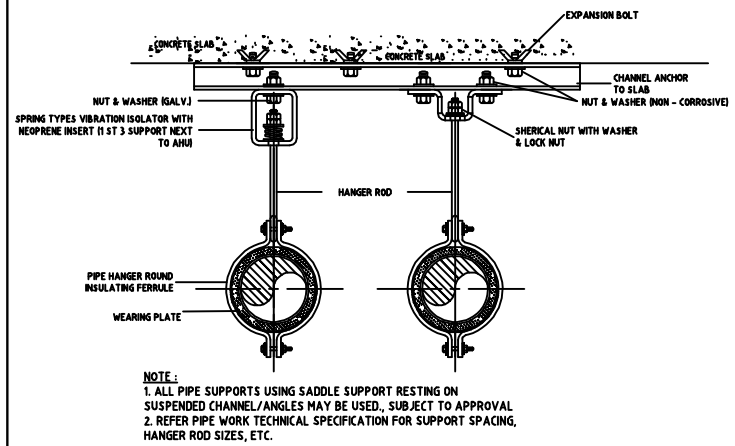
PIPE HANGER FOR SIZE UP TO ø2"



CEILING MOUNTED FAN COIL UNIT DETAIL.

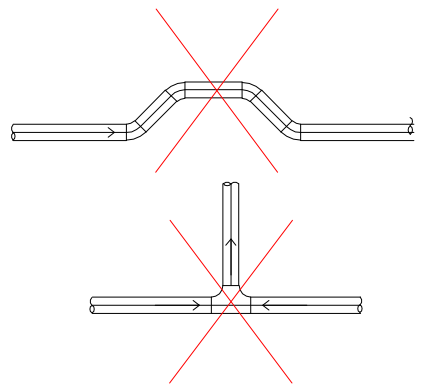


NOTE
ALL MS PARTS SHALL BE PAINTED WITH 2 COATS OF ANTI-RUST PAINT AND 1 COAT OF FINISHED PAINIT OR AS SPECIFIED

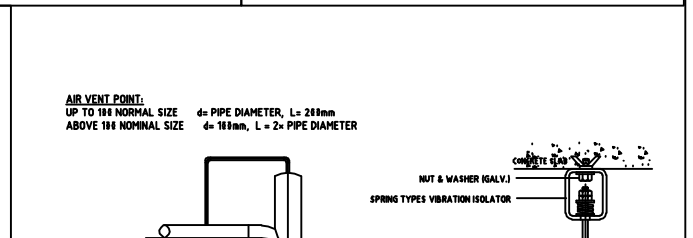


NOTE :
1. ALL PIPE SUPPORTS USING SADDLE SUPPORT RESTING ON SUSPENDED CHANNEL/ANGLES MAY BE USED., SUBJECT TO APPROVAL
2. REFER PIPE WORK TECHNICAL SPECIFICATION FOR SUPPORT SPACING, HANGER ROD SIZES, ETC.

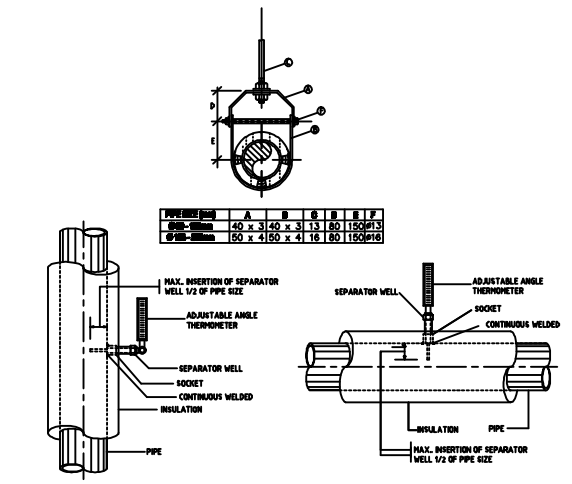
PIPE SUPPORT FROM FLOOR SLAB (DETAIL 'A')



NOT ALLOWED FOR PIPING



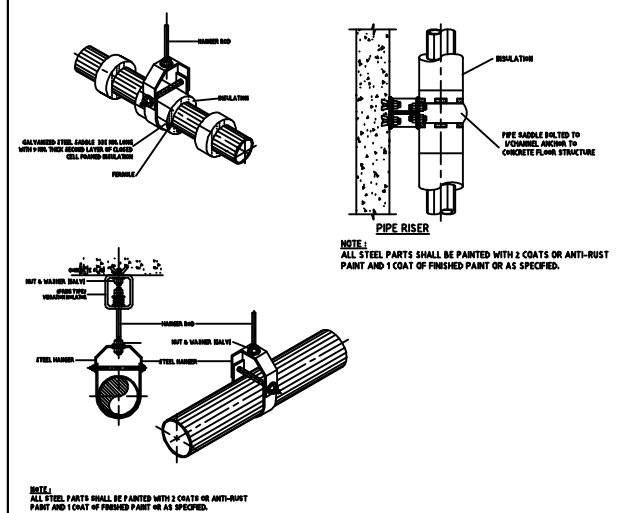
TYPICAL AIR VENT POINT



THERMOMETER VERTICAL PIPE

THERMOMETER HORIZONTAL PIPE

SEPARATOR WELL FOR INSULATED PIPE SHALL BE EXTENSION NECK TYPE.



PIPE SUPPORT FROM FLOOR SLAB (DETAIL 'B')

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Sukanta Kumar Sarker Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : HVAC DRAWING STANDARD DETAIL SHEET 3	July,2020						01			Sheet No: 12
								02			
								03			
								04			
								05			

List of Drawings		Fire Detection Symbols		Letter Symbols	
Dwg No.	Description	Symbols	Description	Symbols	Description
FDS-00	Cover Page		Smoke Detector	NFPA	National Fire Protection Association
FDS-01	List of Drawings, Symbols and Abbreviations	R	Rate of Rise Heat Detector	FM	Factory Mutual
FDS-02	Fire Detection System Schematic Drawing	F	Fixed Tem. Heat Detector	UL	Underwriters Laboratories
FDS-03	Fire Detection System Layout for Ground Floor & Roof Plan (Utility Building)	M	Multi-Sensor	FACP	Fire Alarm Control Panel
		ASD	Aspiration Smoke Detector (ASD)	NAC	Notification Appliance Circuit
FDS-04	Fire Detection System Layout for Ground Floor		Flame Detector	SD	Smoke Detector
FDS-05	Fire Detection System Layout for 1st Floor	P	Manual Pull Station	HD	Heat Detector
FDS-06	Fire Detection System Layout for 2nd Floor	AOM	Addressable Output Module (Control Module)	MS	Multi Sensor
FDS-07	Fire Detection System Layout for 3rd Floor	AIM	Addressable Input Module (Monitor Module)	FLD	Flame Detector
FDS-08	Fire Detection System Layout for 4th Floor		Strobe With Horn	ASD	Aspiration Smoke Detector
FDS-09	Fire Detection System Layout for Roof Plan	IM	Isolator Module	AIM	Addressable Input Module
FDS-10	Standard Detail Drawing	FACP	Fire Alarm Control Panel	AOM	Addressable Output Module
			Exit Sign	MPS	Manual Pull Station
			Emergency Light	SH	Strobe With Horn
			Exit Route	FD	Fire Door
		J	Telephone Jack	L	Loop
		H	Telephone Handset	°C	Degree Celcius
			Horn Type Speaker	°F	Degree Fahrenheit
			Ceiling Mounted Speaker	mm	Millimeter
			2- Hour Fire Rated Door	CM	Centimeter
			End of Line Resistor	M	Meter
			Fire Sensor & Devices Cable (2 X 1.5mm²)	Max	Maximum
			Fire Alarm (NAC) Cable (2 X 2.5mm²)	Min	Minimum

CLIENT:	PROJECT NAME:	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarkar Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: List of Drawing, Symbol & Abbreviations	July,2020						01			Sheet No: 01
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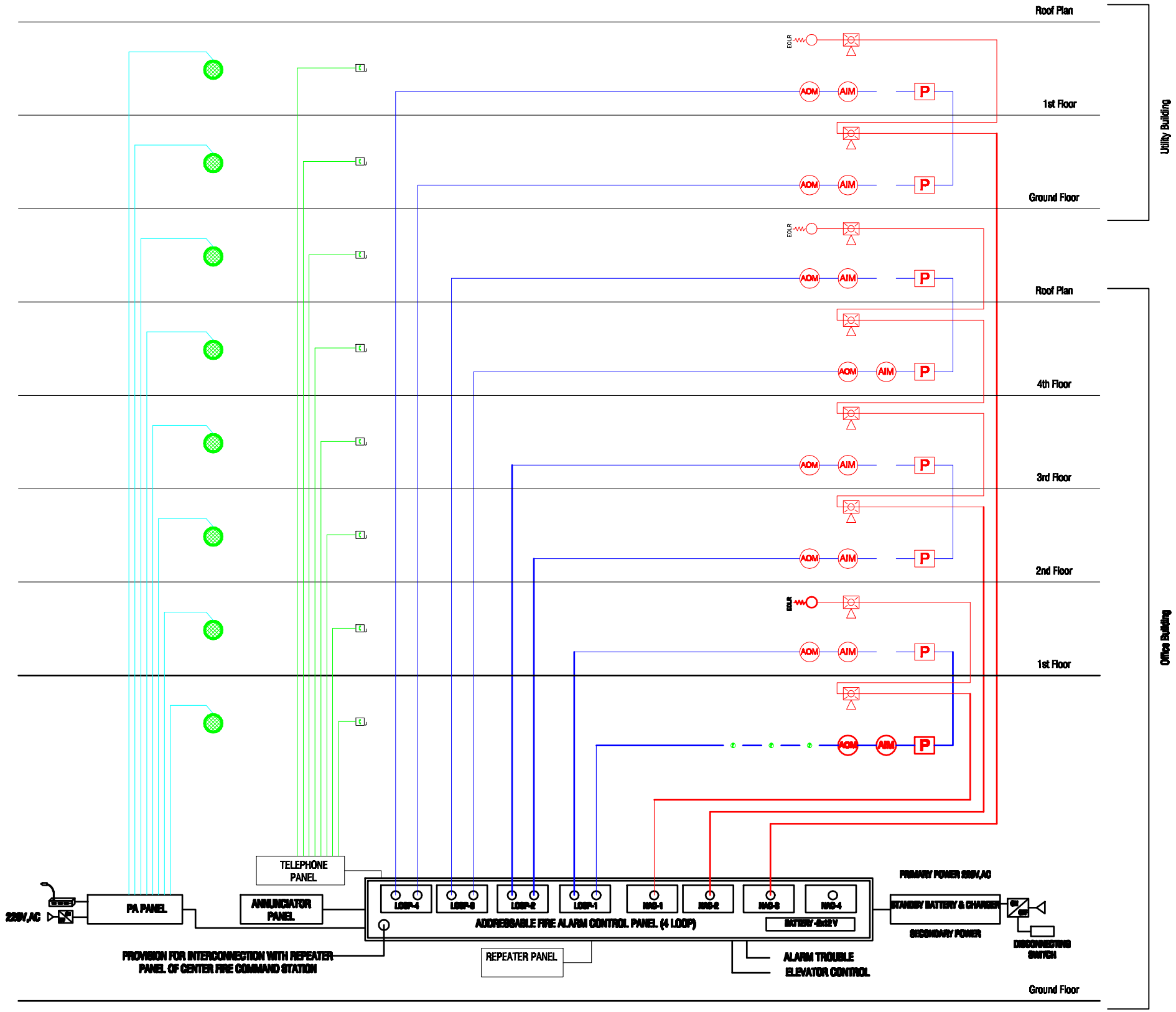

CLIENT:	PROJECT NAME :	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD opeator	Subrata Kumar Sarkar Office Engineer	Md. Hasmotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: List of Drawing, Symbol & Abbreviations	July,2020						01			Sheet No: 02
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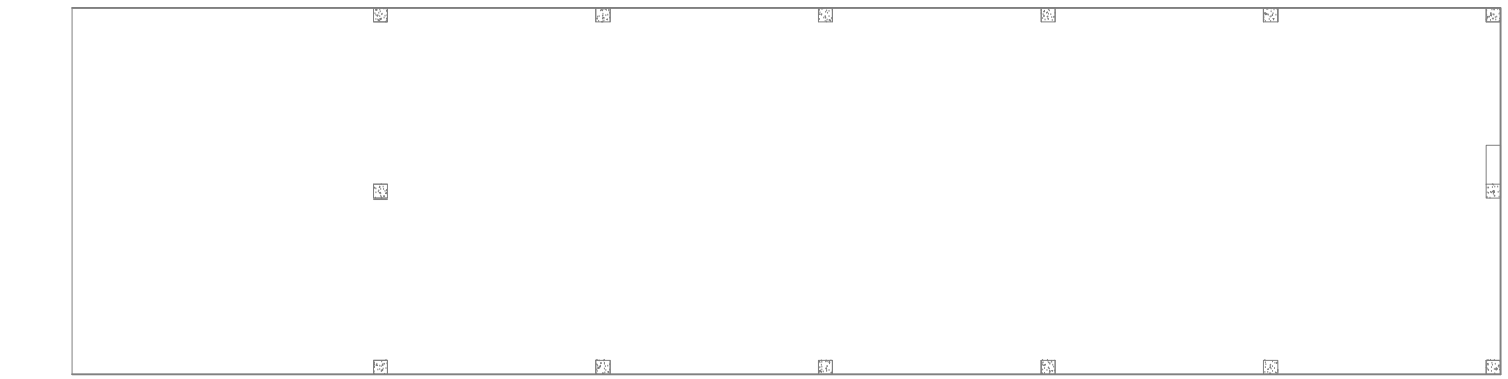
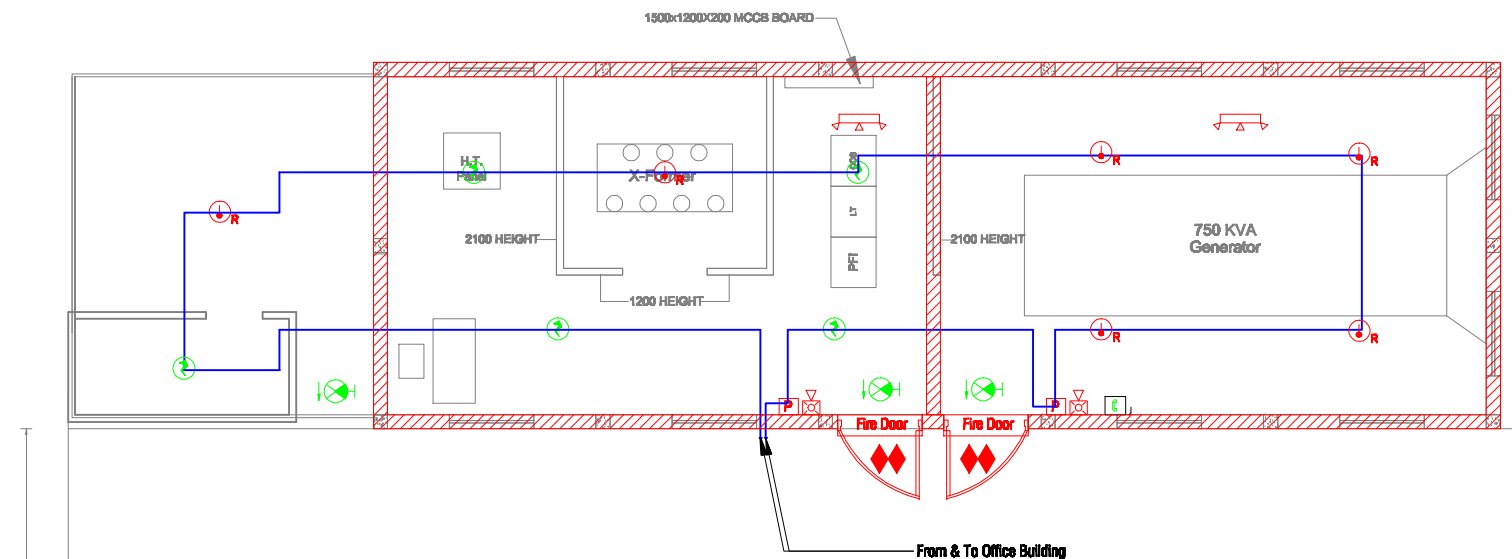
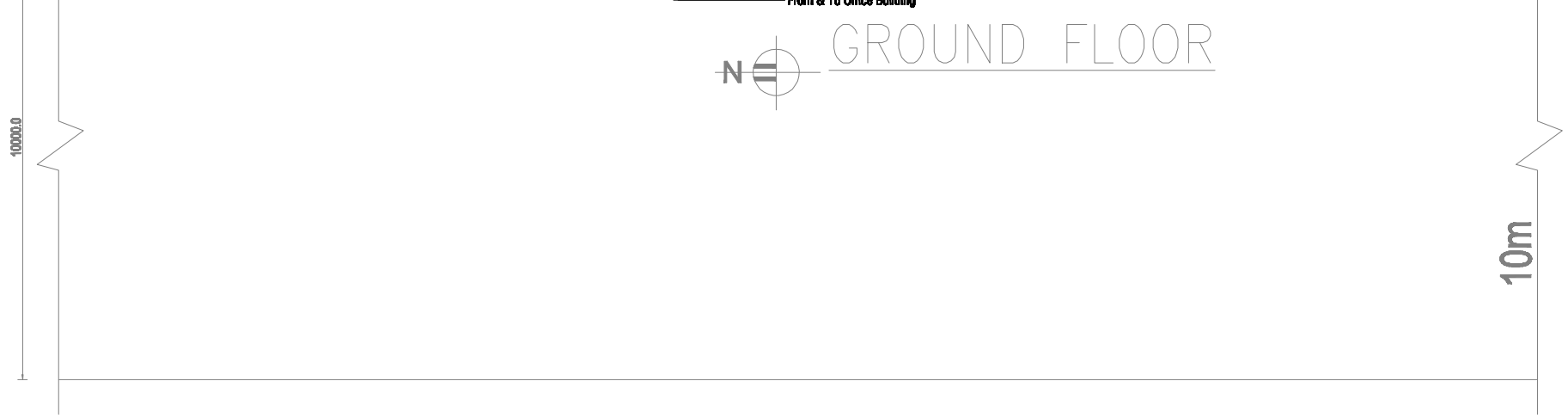


N ROOF TOP
CHILLER PLANT ROOM



N GROUND FLOOR



N UTILITY BUILDING LAYOUT PLAN N

CLIENT:	PROJECT NAME:	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETB(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarkar Office Engineer	Md. Hasnatuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Detection system layout for Ground Floor & Roof plan (Utility Building)	July,2020						01			Sheet No: 03
								02			
								03			
								04			
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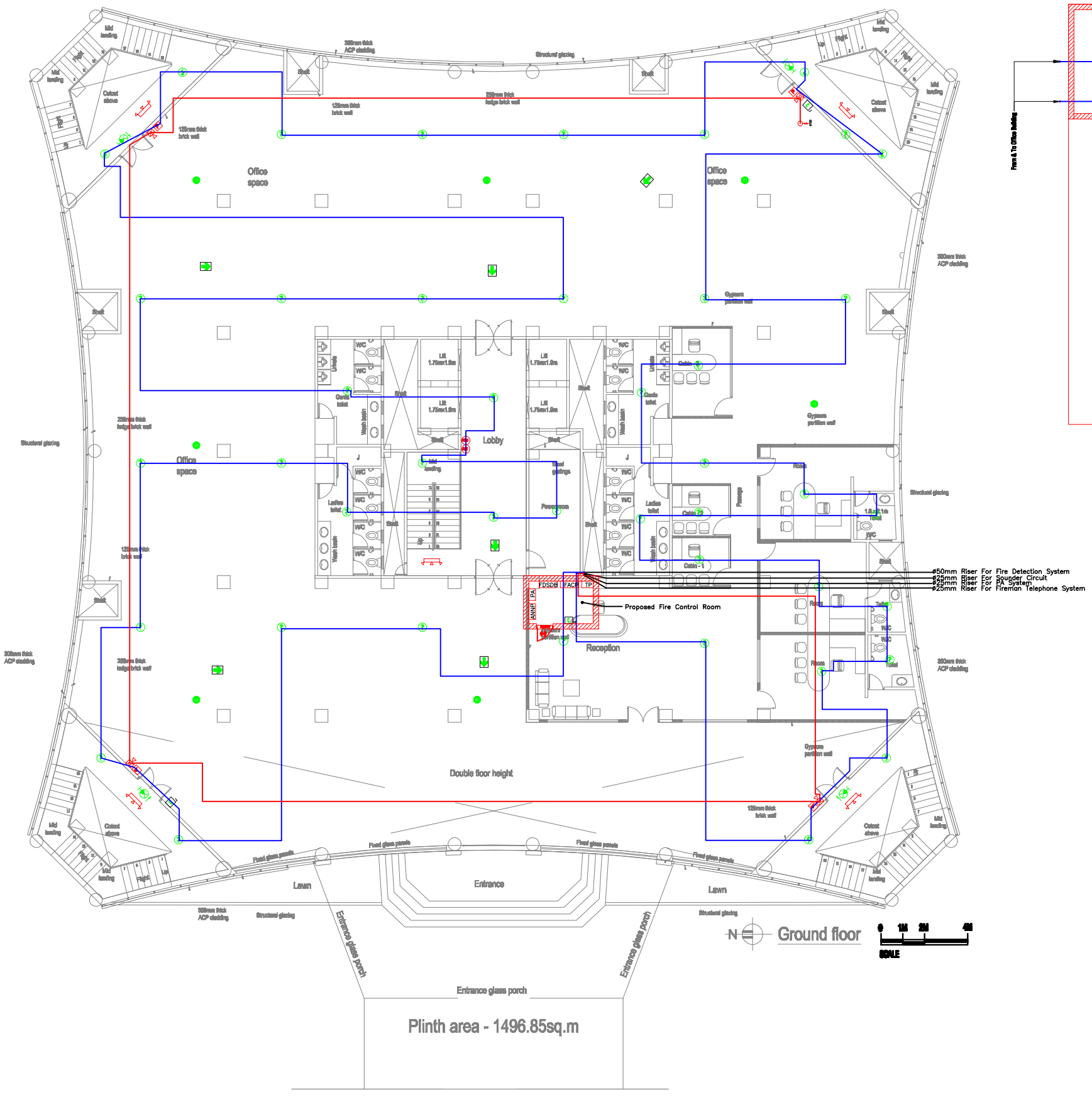

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BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETB(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subasis Kumar Sarker Office Engineer	Md. Hasanuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Detection System Layout for Ground Floor	July,2020						01			Sheet No: 04
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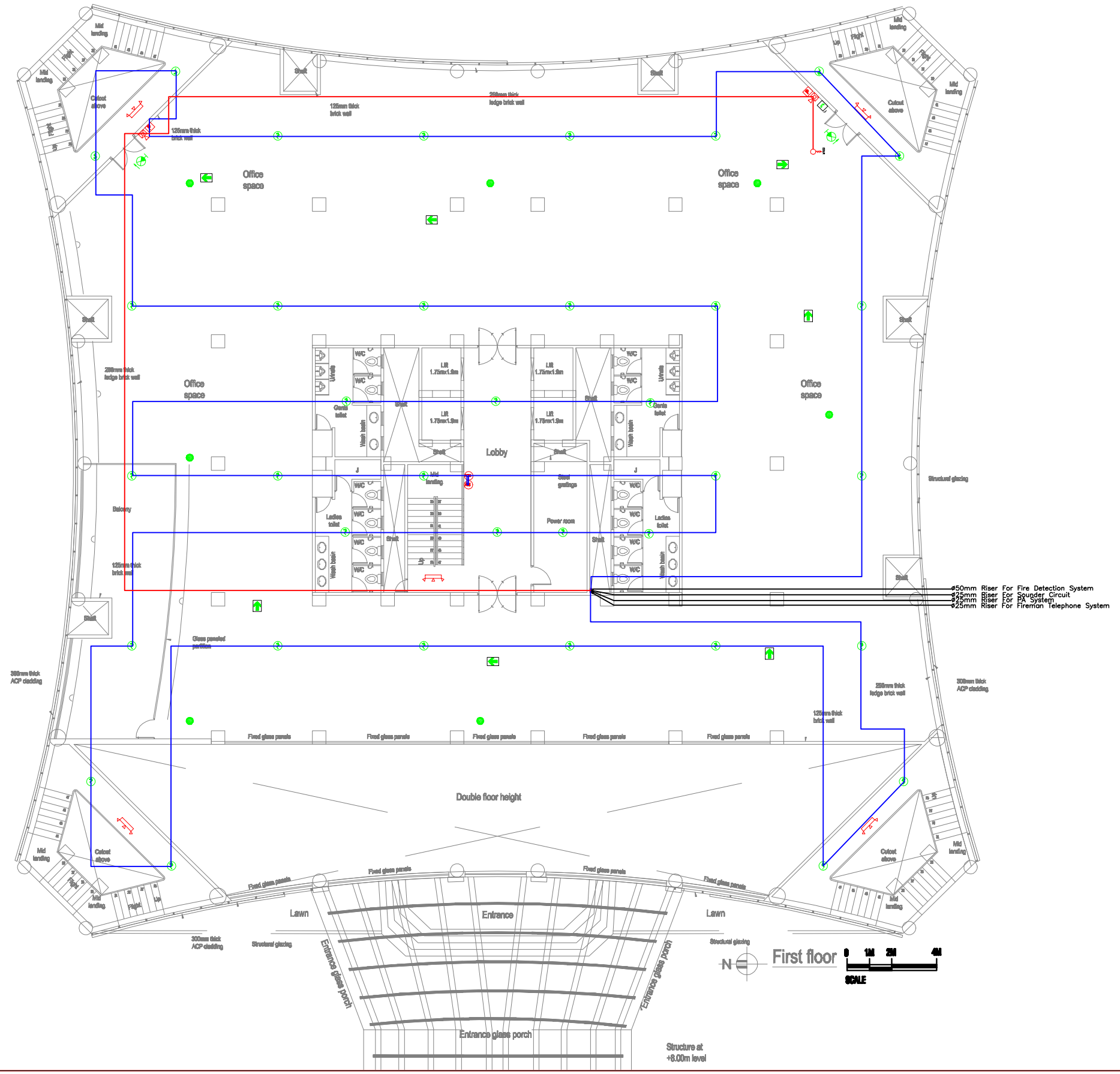

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BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subash Kumar Sarker Office Engineer	Md. Hasanuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Detection System Layout for 1st Floor	July,2020						01			Sheet No: 05
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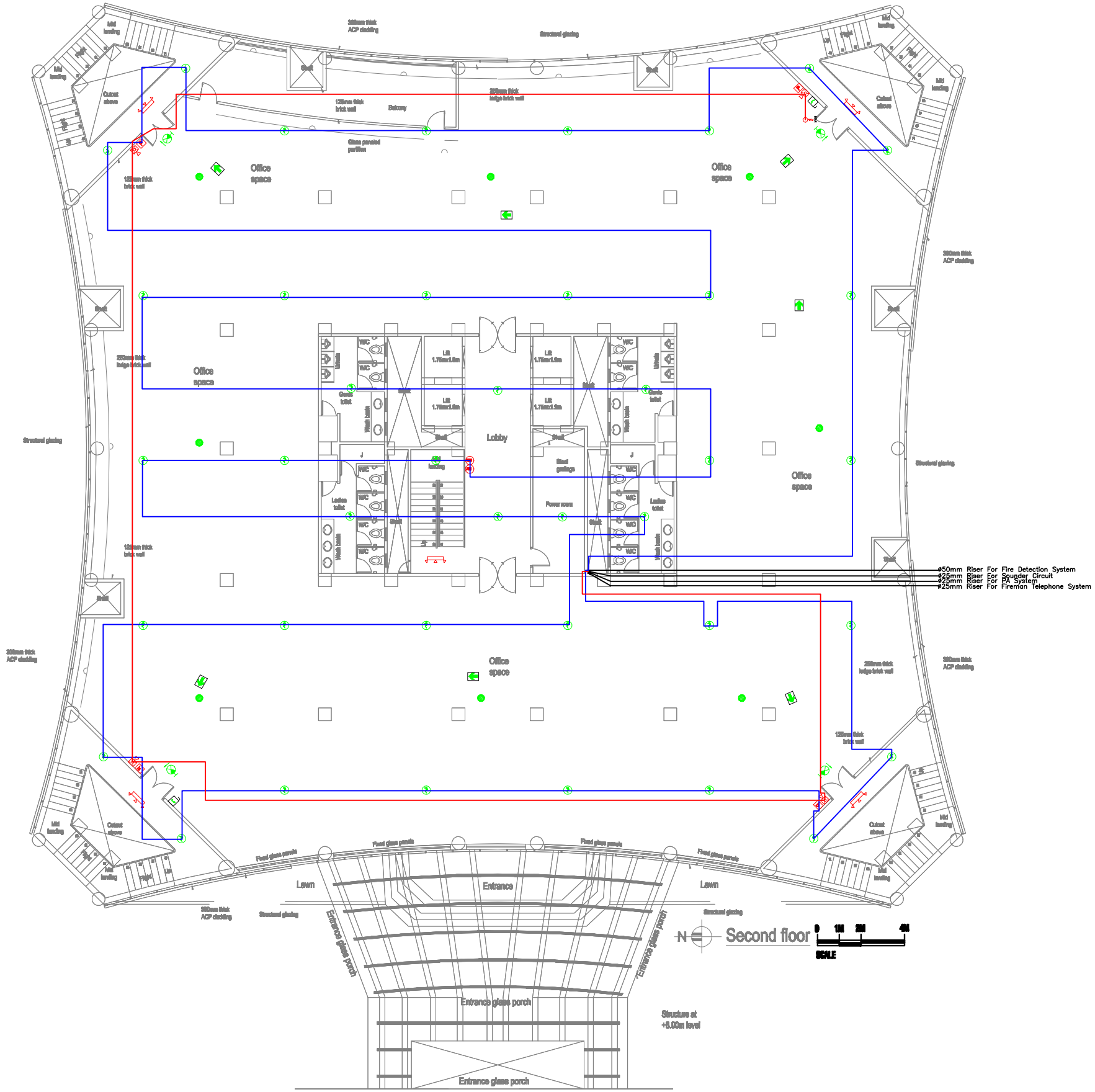

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Detection System Layout for 2nd Floor	July,2020						01			Sheet No: 06
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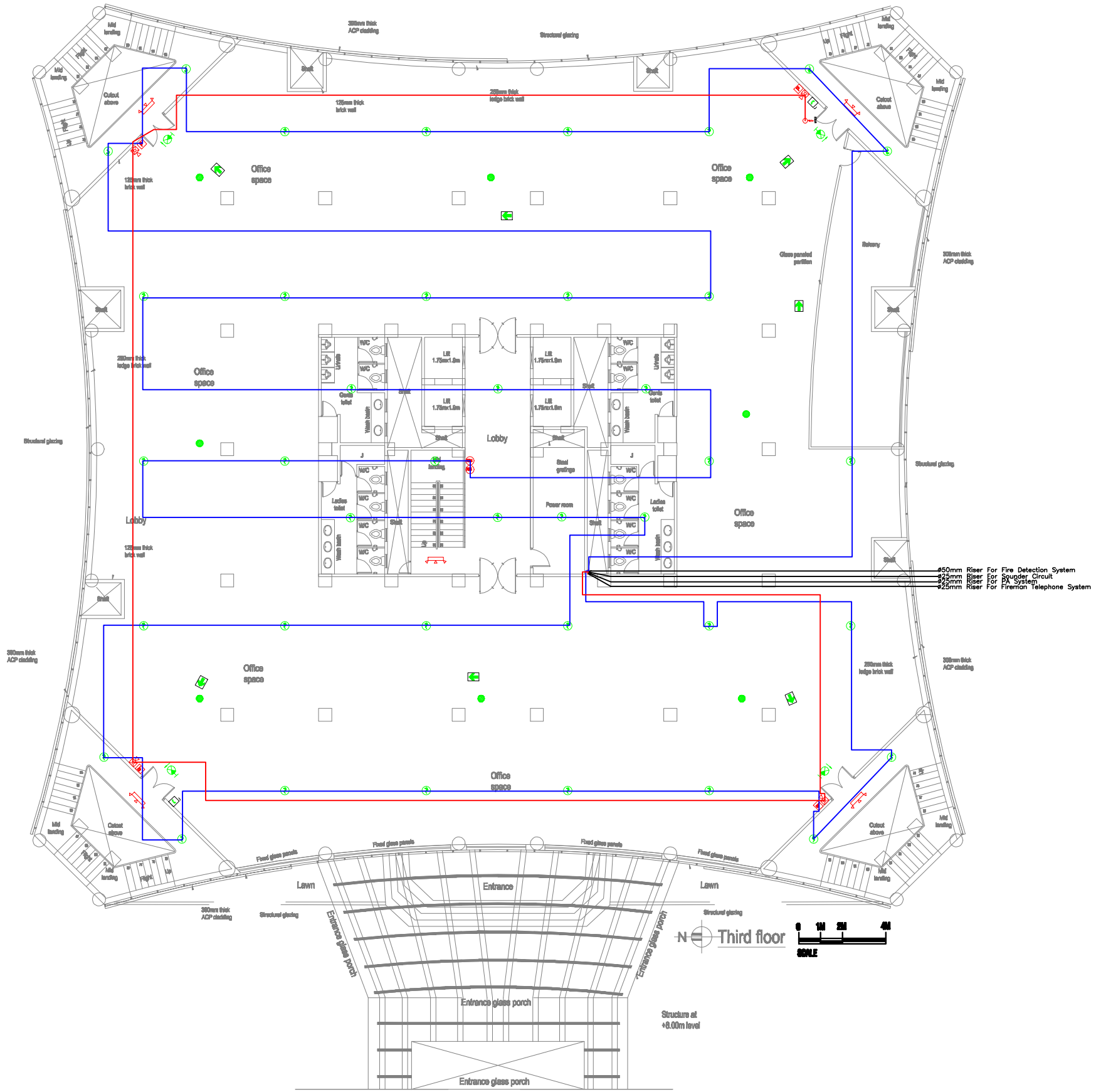

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BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarkar Office Engineer	Md. Hasanuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Detection System Layout for 3rd Floor	July,2020						01			Sheet No: 07
								02			
								03			
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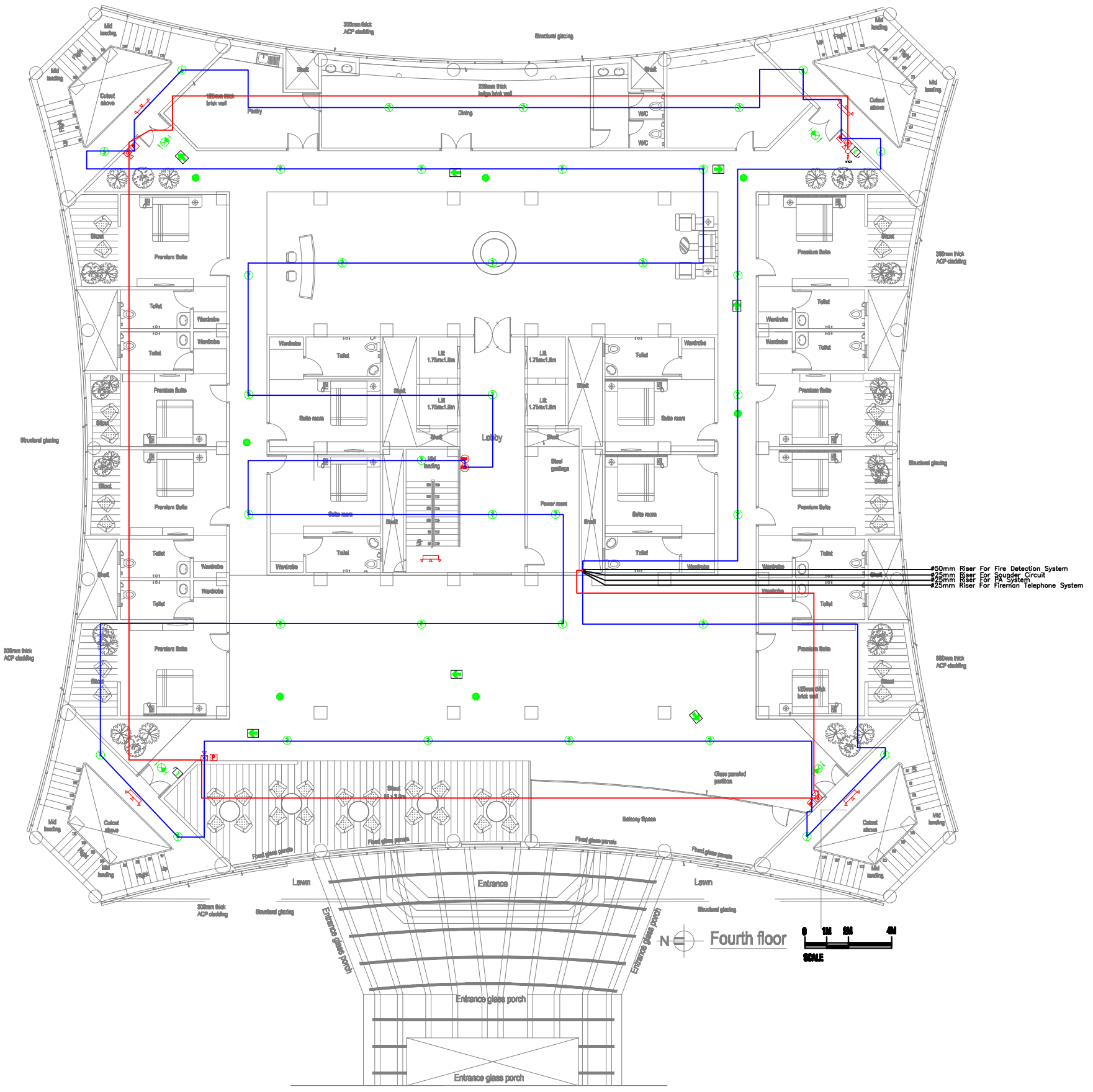

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE : Fire Detection System Layout for 4th Floor	July,2020						01			Sheet No: 08
								02			
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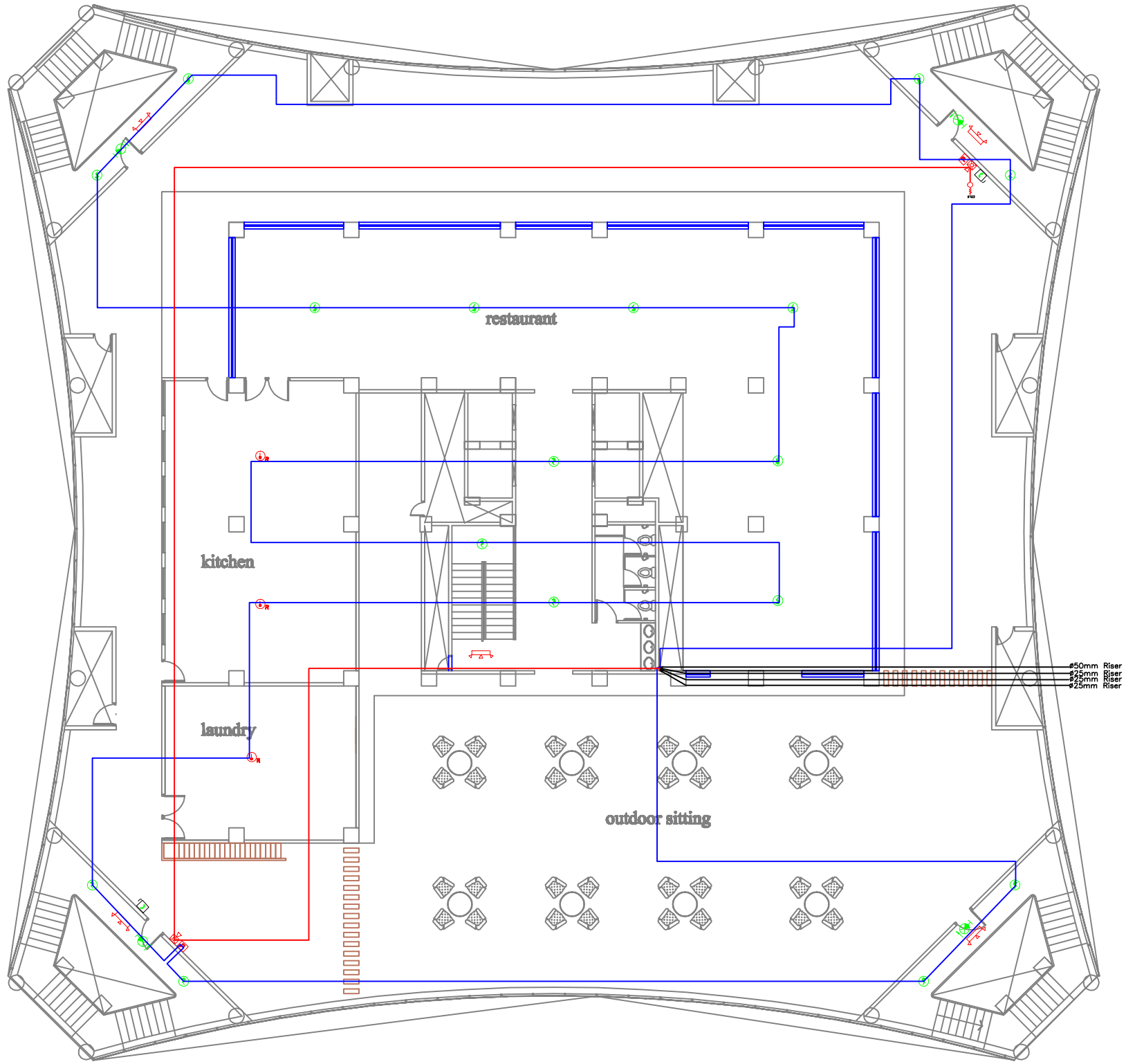
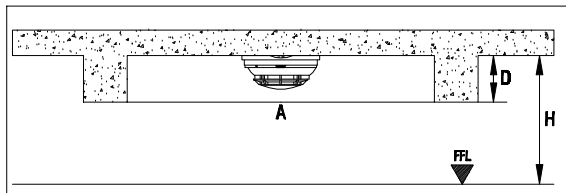


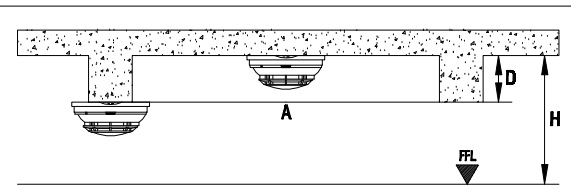
ROOF TOP LAYOUT PLAN

CLIENT:	PROJECT NAME:	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(A/) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarker Office Engineer	Md. Hasnafuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Detection System Layout for Roof Plan	July,2020						01			Sheet No: 09
								02			
								03			
								04			
								05			



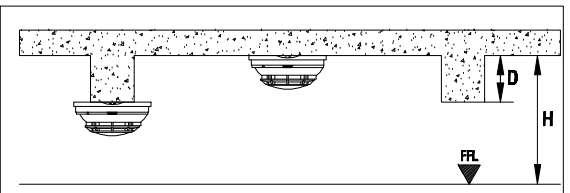
BEAM CONSIDERATION: 10% OF H>D
40% OF H>A

SPOT-TYPE DETECTOR SHALL BE INSTALL EVERY BEAM POCKET



BEAM CONSIDERATION: 10% OF H>D
40% OF H<A

SPOT-TYPE DETECTORS SHALL BE PERMITTED TO BE LOCATED ON CEILINGS OR ON THE BOTTOM OF BEAMS.



BEAM CONSIDERATION: 10% OF H<D

SPOT-TYPE DETECTORS SHALL BE PERMITTED TO BE LOCATED ON CEILINGS OR ON THE BOTTOM OF BEAMS.

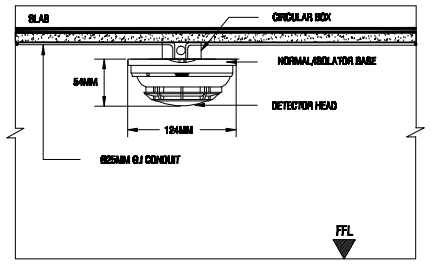


FIG-1: FIXING DETAILS FOR SMOKE DETECTOR FIXED TO SOFIT

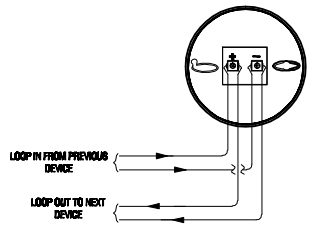


FIG-2: WIRING DETAILS FOR SMOKE DETECTOR WITH NORMAL BASE

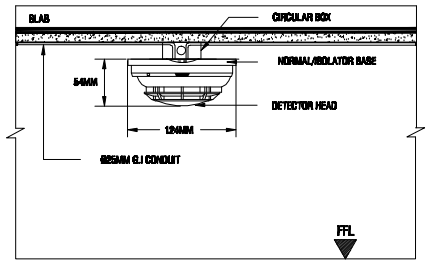


FIG-3: FIXING DETAILS FOR MULTI SENSOR DETECTOR FIXED TO SOFIT

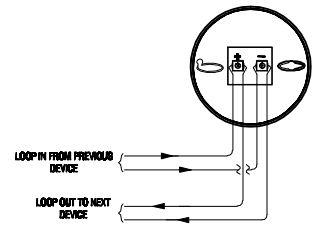
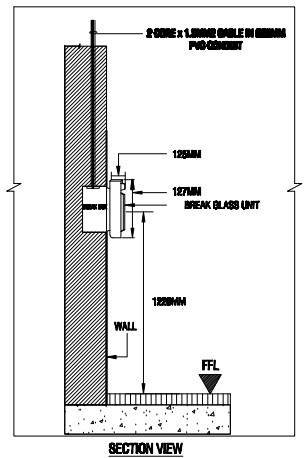


FIG-4: WIRING DETAILS FOR MULTI SENSOR DETECTOR WITH NORMAL BASE



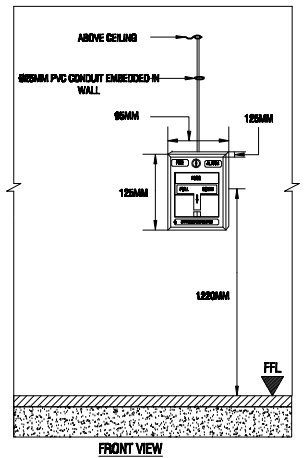


FIG-5: FIXING DETAILS FOR MANUAL PULL STATION/BREAK GLASS UNIT

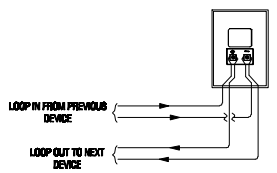
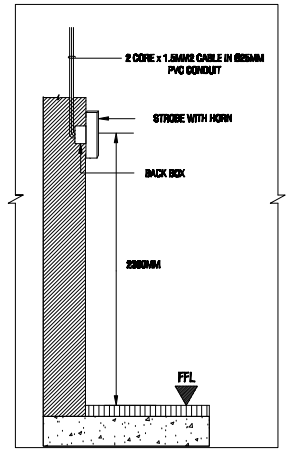


FIG-6: WIRING DETAILS FOR MANUAL PULL STATION/BREAK GLASS UNIT



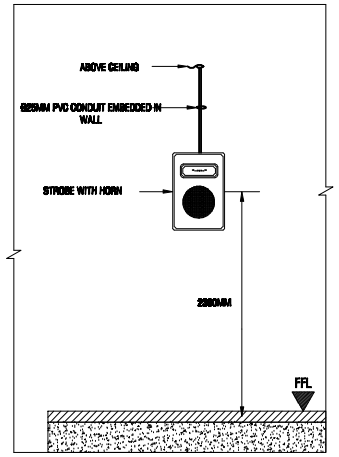


FIG-7: FIXING DETAILS FOR WALL MOUNTED STROBE WITH HORN

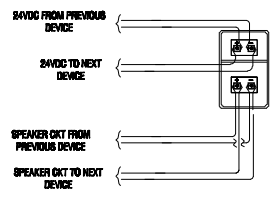


FIG-8: WIRING DETAILS FOR WALL MOUNTED STROBE WITH HORN

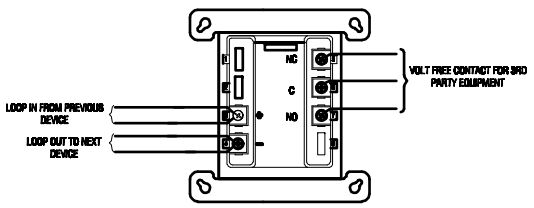


FIG-9: WIRING DETAILS FOR ADDRESSABLE OUTPUT MODULE (CONTROL MODULE)

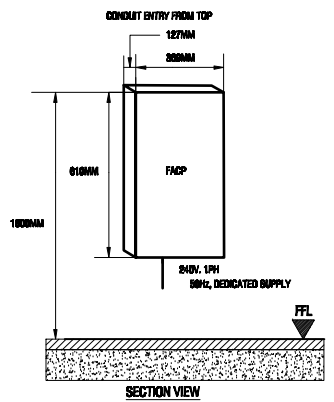


FIG-10: FIRE ALARM CONTROL PANEL (FACP)

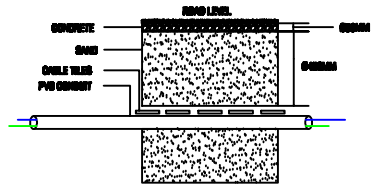


FIG-11: UNDERGROUND CABLE SECTION

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BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	SK KALIM UDDIN CAD operator	Subrata Kumar Sarkar Office Engineer	Md. Hasmoluzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: List of Drawing, Symbol & Abbreviations	July,2020						01			Sheet No: 10
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LIST OF DRAWINGS	
DWG. NO.	DESCRIPTION
FPS–00	COVER PAGE
FPS–01	LIST OF DRAWINGS, SYMBOLS & ABBREVIATIONS
FPS–02	FIRE PROTECTION SYSTEM SCHEMATIC DRAWING
FPS–03	FIRE PUMP SYSTEM SCHEMATIC DRAWING
FPS–04	FIRE PUMP CONTROLLING SYSTEM SCHEMATIC DRAWING
FPS–05	FIRE PROTECTION SYSTEM LAYOUT DRAWING OF GROUND & ROOF TOP (UTILITY BUILDING)
FPS–06	FIRE PROTECTION SYSTEM LAYOUT DRAWING OF GROUND FL
FPS–07	FIRE PROTECTION SYSTEM LAYOUT DRAWING OF 1ST FLOOR
FPS–08	FIRE PROTECTION SYSTEM LAYOUT DRAWING OF 2ND FLOOR
FPS–09	FIRE PROTECTION SYSTEM LAYOUT DRAWING OF 3RD FLOOR
FPS–10	FIRE PROTECTION SYSTEM LAYOUT DRAWING OF 4TH FLOOR
FPS–11	FIRE PROTECTION SYSTEM LAYOUT DRAWING OF ROOF PLAN
FPS–12	STANDARD DETAIL DRAWING (A)
FPS–13	STANDARD DETAIL DRAWING (B)
FPS–14	STANDARD DETAIL DRAWING (C)
FPS–15	STANDARD DETAIL DRAWING (D)

VALVE & FIRE PROTECTION SYSTEM SYMBOLS	
SYMBOLS	DESCRIPTION
	GATE VALVE (NON– RISING STEAM)
	OS & Y GATE VALVE
	CHECK VALVE
	BALL VALVE
	BUTTERFLY VALVE
	BUTTERFLY VALVE WITH SUPERVISORY SWITCH
	PRESSURE RELIEF VALVE (PILOT OPERATED)
	ALARM CHECK VALVE
	PRESSURE REDUCING VALVE
	ANTI VORTEX PLATE
	FOOT VALVE
	AUTO AIR VENT WITH BALL VALVE
	PUMP
	Y– STRAINER
	FLOW DIRECTION
	4 WAY FIRE BRIGADE CONNECTION
HHC	HYDRANT HOSE CABINET
SP	UPRIGHT SPRINKLER
SP	PENDANT SPRINKLER
	CO2 PORTABLE FIRE EXTINGUISHER
	DRY CHEMICAL PORTABLE FIRE EXTINGUISHER
	WET CHEMICAL TYPE PORTABLE FIRE EXTINGUISHER
	AUTOMATIC MODULAR TYPE CEILING MOUNTED EXTINGUISHER (CLEAN AGENT)
	AUTOMATIC MODULAR TYPE CEILING MOUNTED EXTINGUISHER (FOAM)
	PILLAR HYDRANT
	LANDING VALVE
FS	FLOW SWITCH
	SIGHT GLASS
	UNION
	PRESSURE GAUGE WITH BALL VALVE
	2– HOUR FIRE RATED DOOR
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER

LETTER SYMBOLS	
SYMBOLS	DESCRIPTION
BNBC	BANGLADESH NATIONAL BUILDING CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
ANSI	AMERICAN NATIONAL STANDARD INSTITUTE
ASTM	AMERICAN SOCIETY FOR TESTING MATERIAL
ANSI	AMERICAN NATIONAL STANDARD INSTITUTE
FM	FACTORY MUTUAL
UL	UNDERWRITERS LABORATORIES
EP	ELECTRIC PUMP
DP	DIESEL PUMP
JP	JOCKEY PUMP
AP	ANNUNCIATOR PANEL
GPM	GALLON PER MINUTE
FS	FLOW SWITCH
HP	HORS POWER
Hz	HERTZ
KG	KILOGRAM
KW	KILOWATT
LB	POUND
AC	ALTERNATING CURRENT
DC	DIRECT CURRENT
A/C	ABOVE CEILING
B/C	BELOW CEILING
A/F	ABOVE FLOOR
&	AND
°C	DEGREE CELCIUS
°F	DEGREE FAHRENHEIT
mm	MILLIMETER
CM	CENTIMETER
M	METER
ABBREV	ABBREVIATION
BLDG	BUILDING
MAX	MAXIMUM
MIN	MINIMUM
N.P.T	NATIONAL PIPE TREAD
RN	RISER NIPPLE

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: List of Drawing, Symbol & Abbreviations	July, 2020						01			Sheet No: S-01
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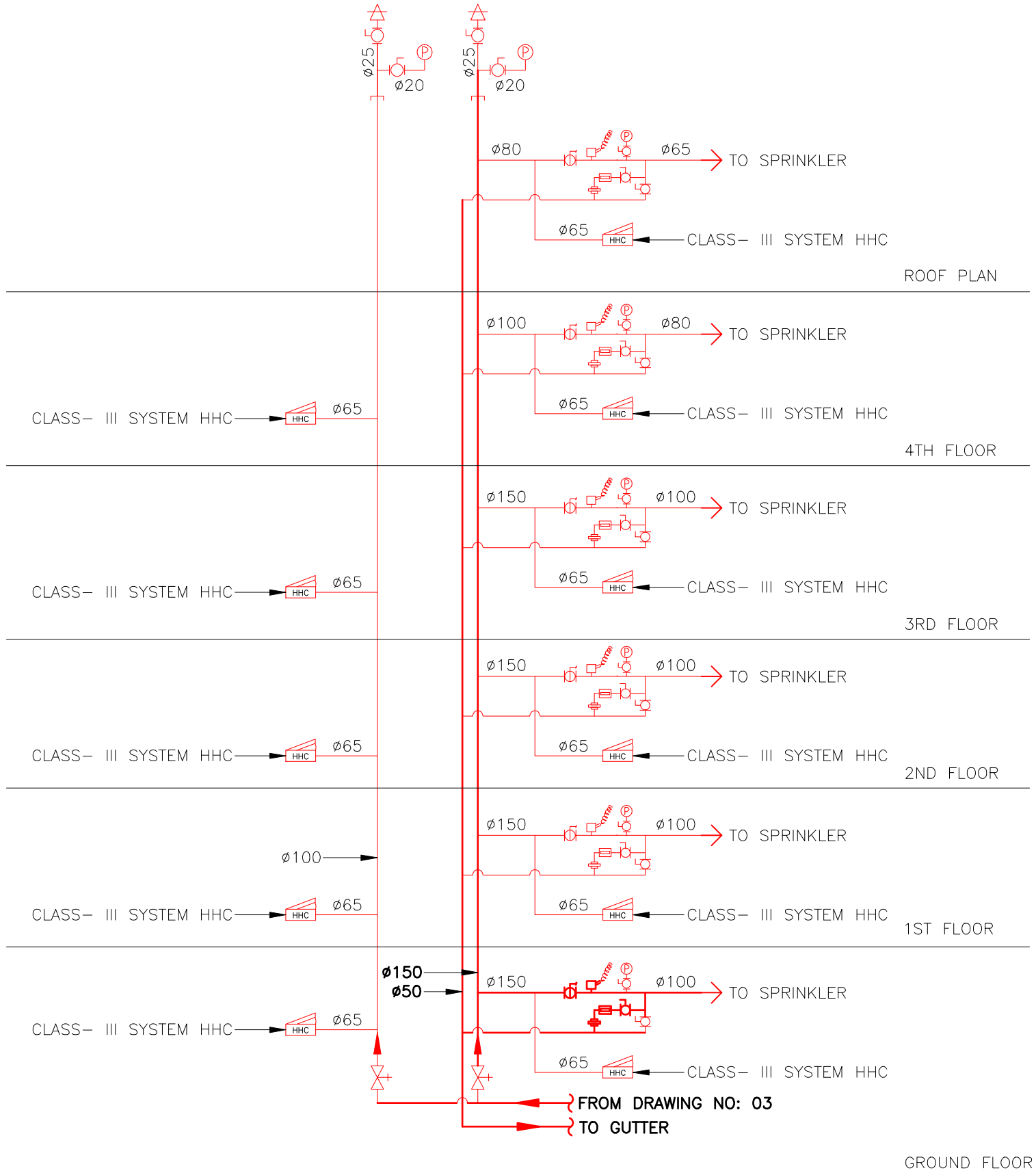

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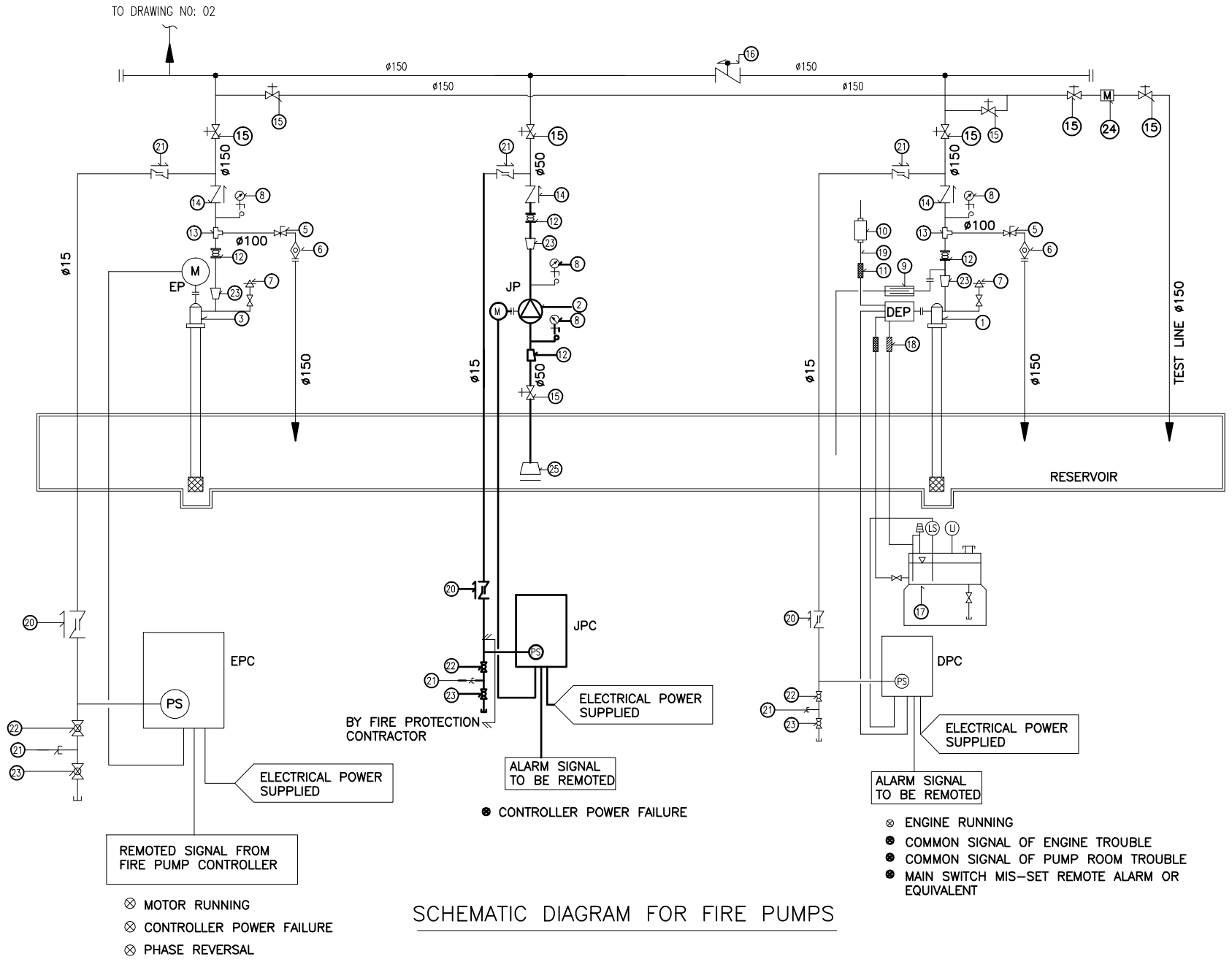

SCHEMATIC DIAGRAM FOR FIRE PUMPS

EQUIPMENT DESCRIPTION

ITEM NO.	DESCRIPTION
①	DIESEL ENGINE DRIVEN FIRE PUMP (DEP)
②	JOCKEY PUMP (JP)
③	ELECTRIC PUMP (EP)
⑤	RELIEF VALVE
⑥	CLOSED WASTE CONE
⑦	AUTOMATIC AIR RELEASE VALVE WITH SEPERATED VALVE.
⑧	PRESSURE GAUGE
⑨	WATER-COOLED HEAT EXCHANGER.
⑩	ENGINE EXHAUST SILENCER.
⑪	EXHAUST STAINLESS STEEL FLEXIBLE CONNECTOR, 25.4mm. THICK PREFORMED MINERAL WOOL INSULATOR WITH ALUMINIUM TAPE WITH 40mm. THICK MIN. WOOL AND 0.6 mm. THICK STAINLESS STEEL JACKET
⑫	FLEXIBLE JOINT
⑬	REDUCED TEE
⑭	CHECK VALVE
⑮	OS & Y- GATE VALVE
⑯	ALARM CHECK VALVE
⑰	160 GALLON FUEL STORAGE TANK WITH SPILL, LEAK CONTAINMENT AND ACCESSORIES
⑱	FUEL STAINLESS STEEL FLEXIBLE CONNECTOR.
⑲	ENGINE EXHAUST PIPE 150mm. CALCIUM SILICATE INSULATOR WITH 0.6 mm. ALUMINIUM JACKET. (EXHAUST PIPE DIAMETER SHALL BE VERIFLY BY MANUFACTURER)
⑳	ø15 ORIFICE CLAPPER VALVE.
㉑	ø15 TEE WITH PLUG.
㉒	ø15 GLOBE VALVE WITH CAP.
㉓	CONCENTRIC REDUCER
㉔	FLOW METER
㉕	FOOT VALVE
㉖	ECCENTRIC REDUCER

NOTE.
1. THE INSTALLATION OF CENTRIFUGAL FIRE PUMPS SYSTEM SHALL BE FABRICATED, INSTALLED, TESTED AND PLACED INTO AUTOMATIC SERVICE IN ACCORDANCE WITH NFPA 20 & THE SPECIFICATION.
2. THE PRESSURE SENSING PIPE AND FITTING SHALL BE MADE OF STAINLESS STEEL PIPE SCHEDULE 80 AND CLASS 300.
3. FUEL PIPE AND FITTING SHALL BE MADE OF COPPER TUBE.

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Pump System Schematic Drawing	July, 2020						01			Sheet No: A-03
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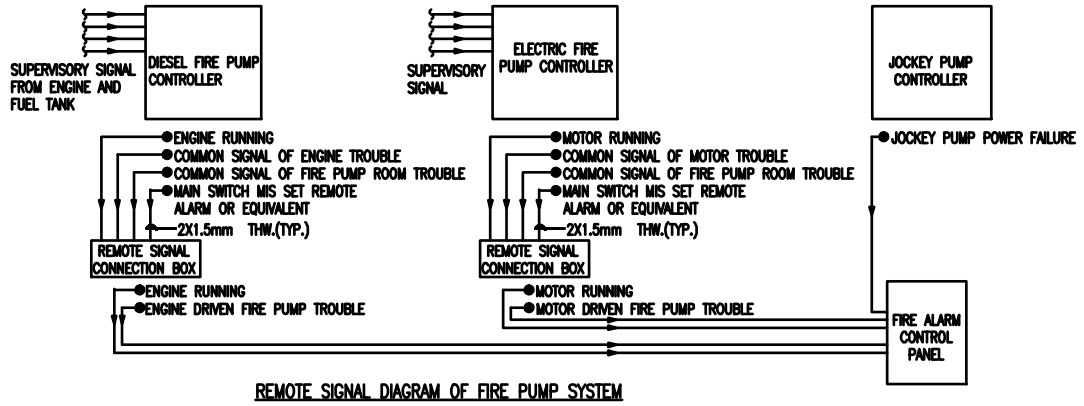
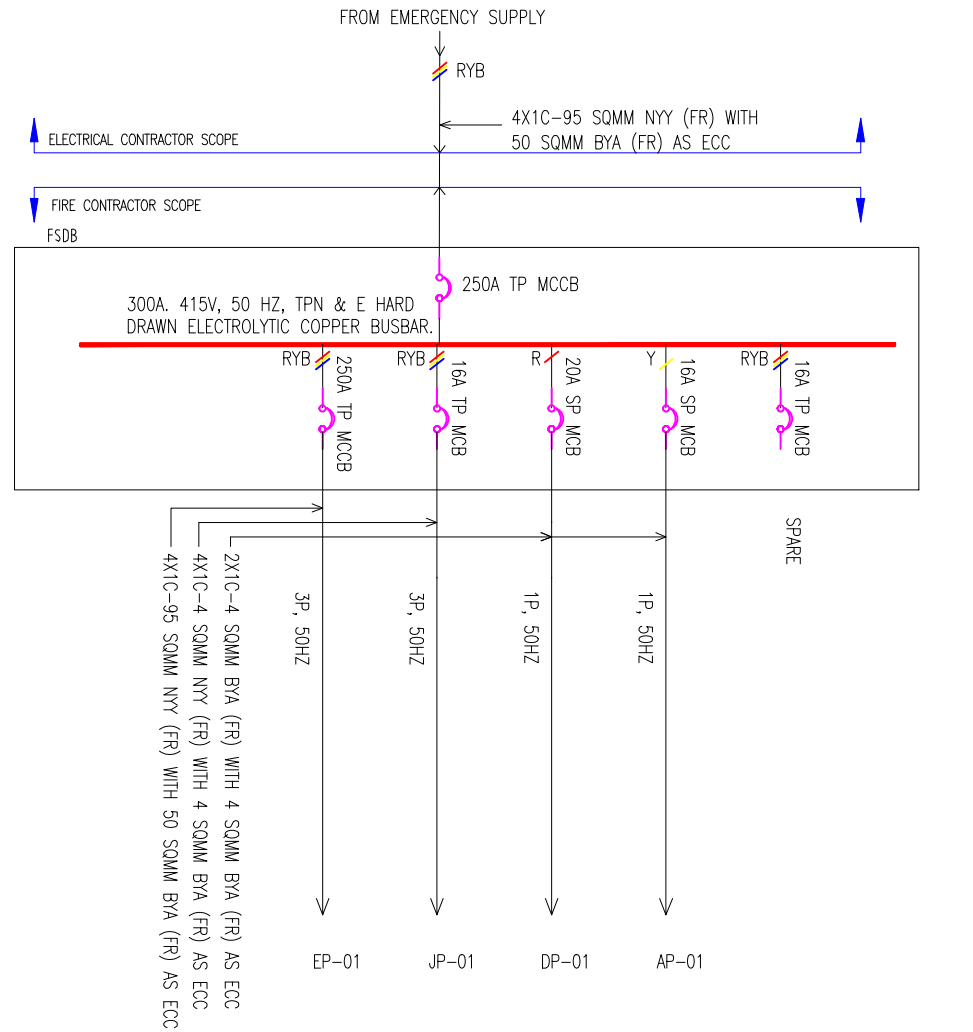
SEQUENCE OF OPERATION FOR FIRE PUMP AND JOCKEY PUMP

DESCRIPTION	FIRE PUMP		JOCKEY PUMP
	DP-01 (DIESEL PUMP)	FP-01 (ELECTRIC PUMP)	JP-01
PRESSURE <131 PSI	OFF	OFF	ON
PRESSURE <125 PSI	OFF	ON	OFF
POWER FAILURE	ON	OFF	OFF



REMOTE SIGNAL DIAGRAM OF FIRE PUMP SYSTEM



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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Pump Controlling System Schematic Drawing	July, 2020						01			Sheet No: A-04
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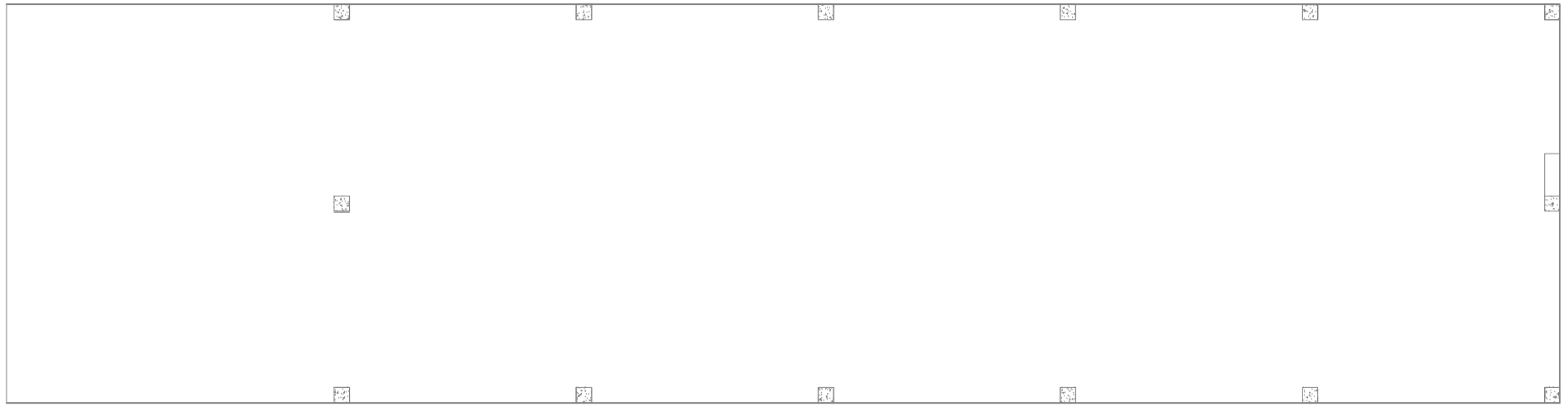

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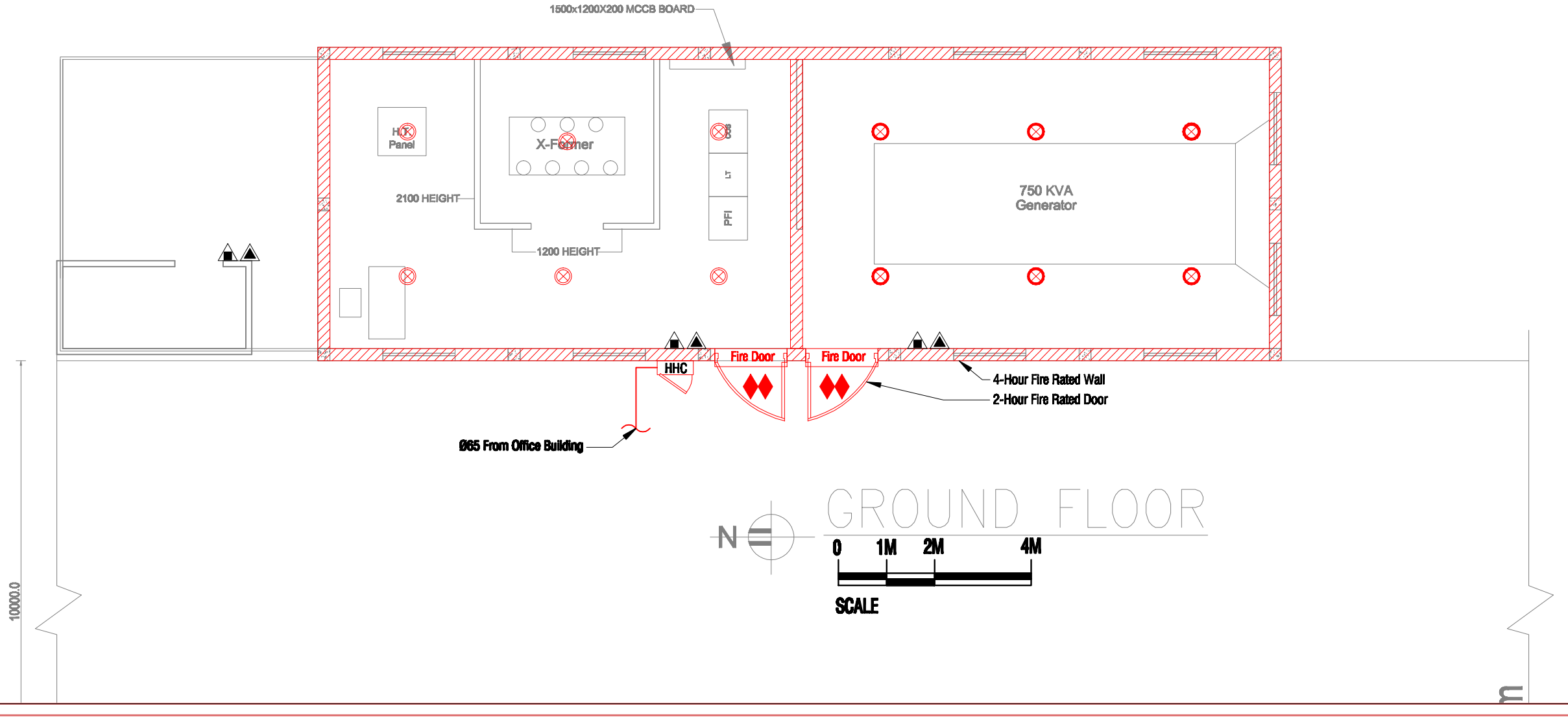
ROOF TOP
CHILLER PLANT ROOM



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GROUND FLOOR

0 1M 2M 4M

SCALE

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Protection System Layout Drawing of Ground Roof Top (Utility Building)	July, 2020						01			Sheet No: S-05
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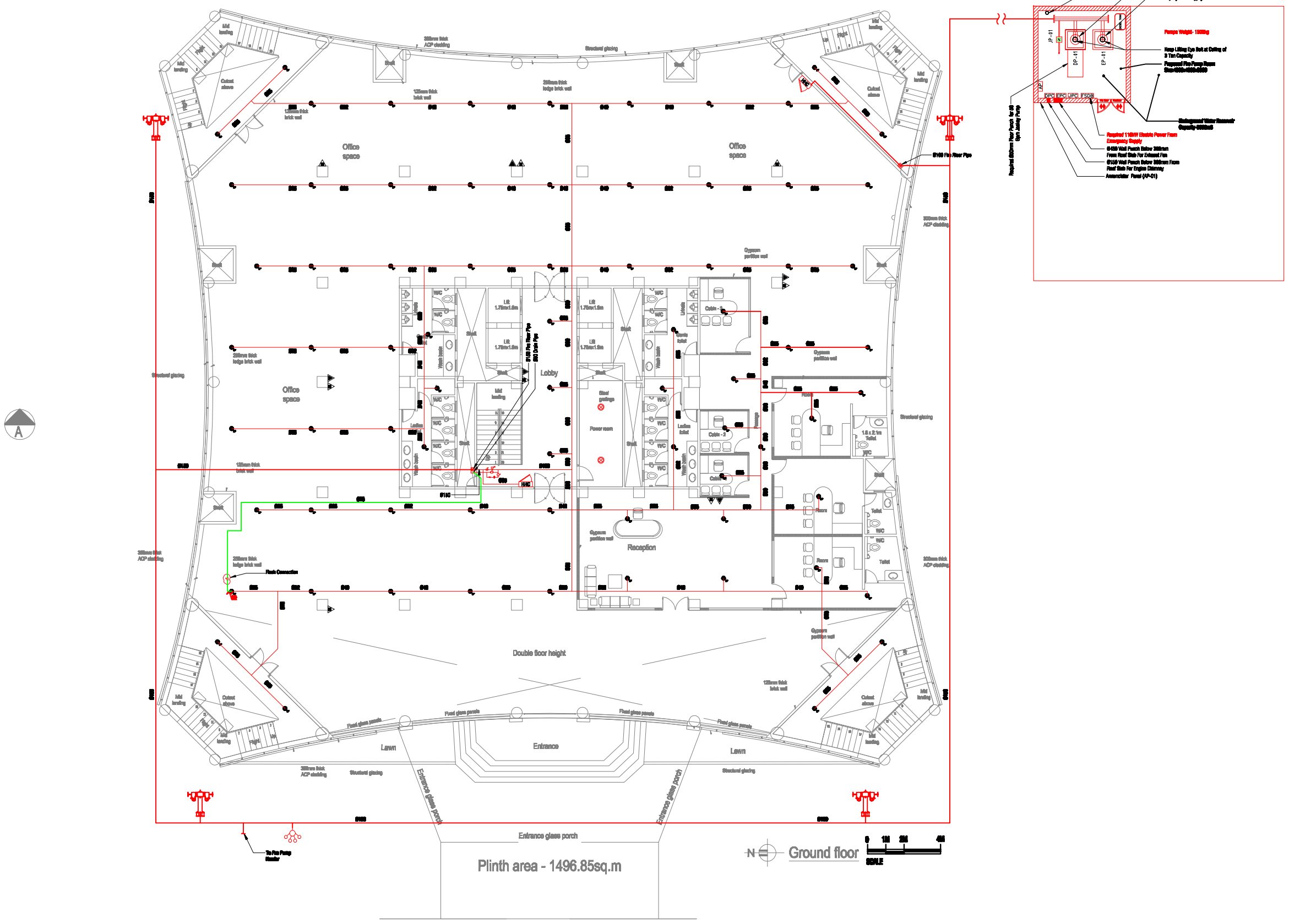

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Protection System Layout Drawing of Ground Floor	June, 2020						01			Sheet No: A-06
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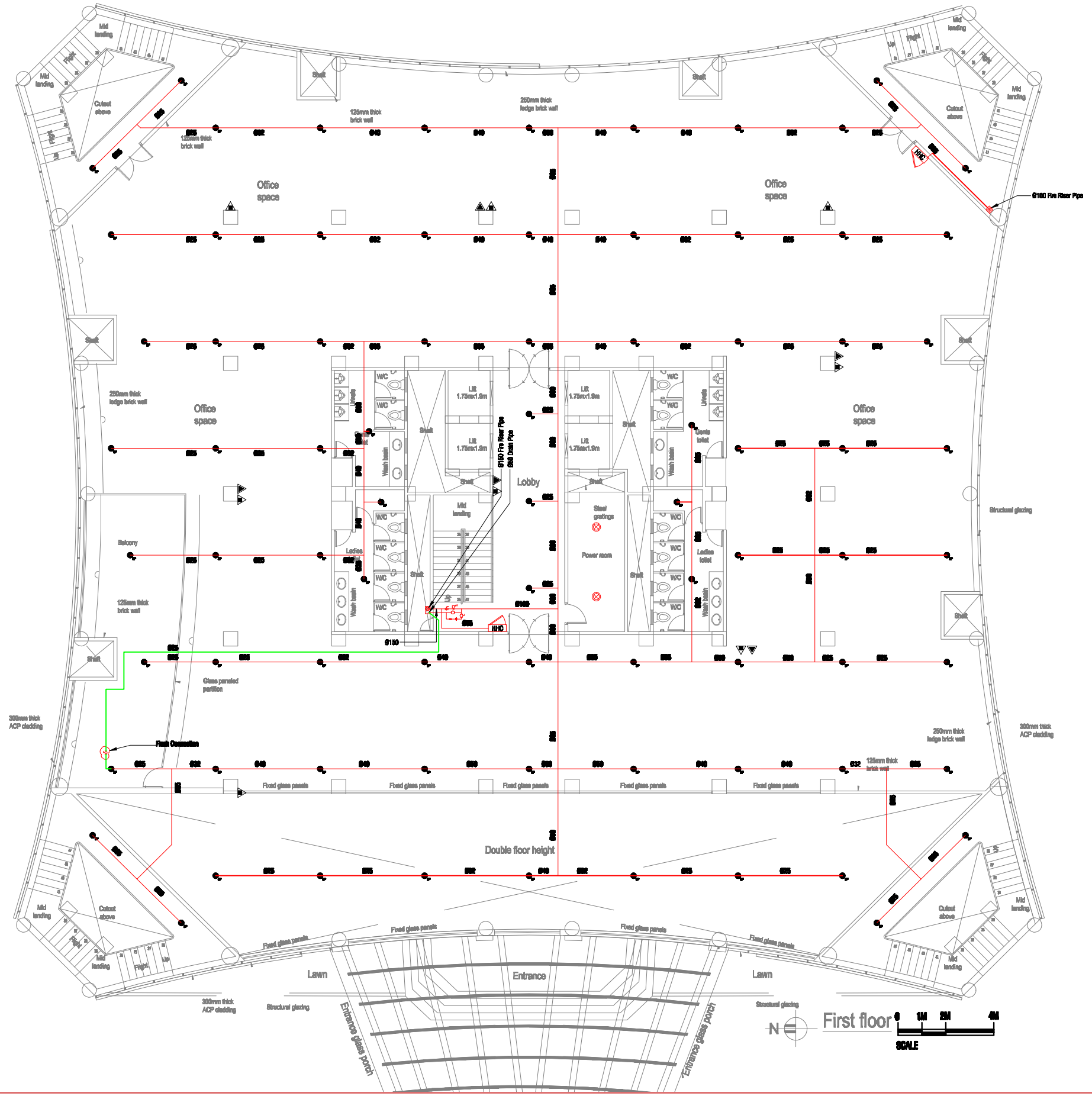

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Protection System Layout Drawing of 1st Floor	July, 2020						01			Sheet No: A-07
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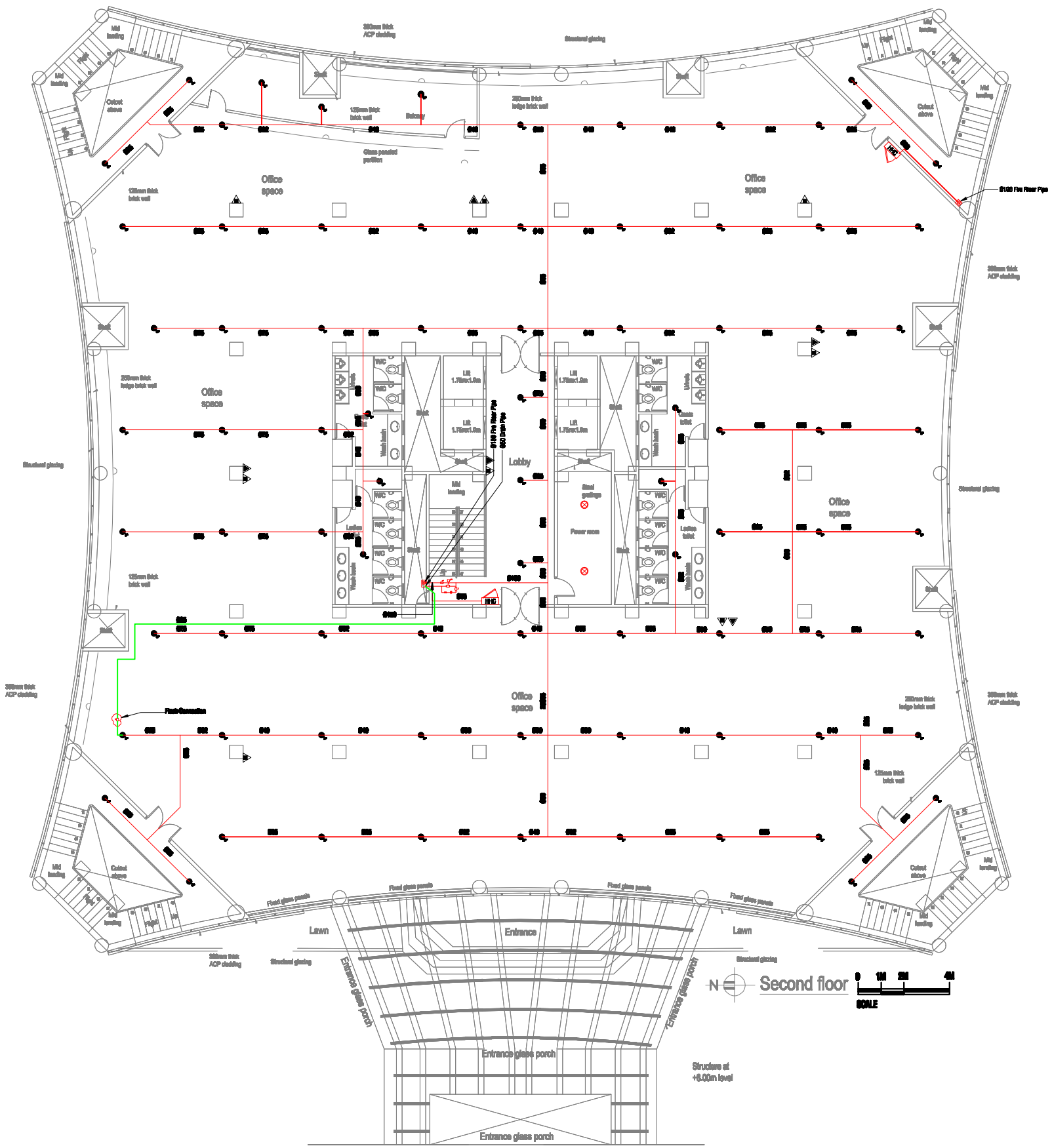

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Protection System Layout Drawing of 2nd Floor	July, 2020						01			Sheet No: S-08
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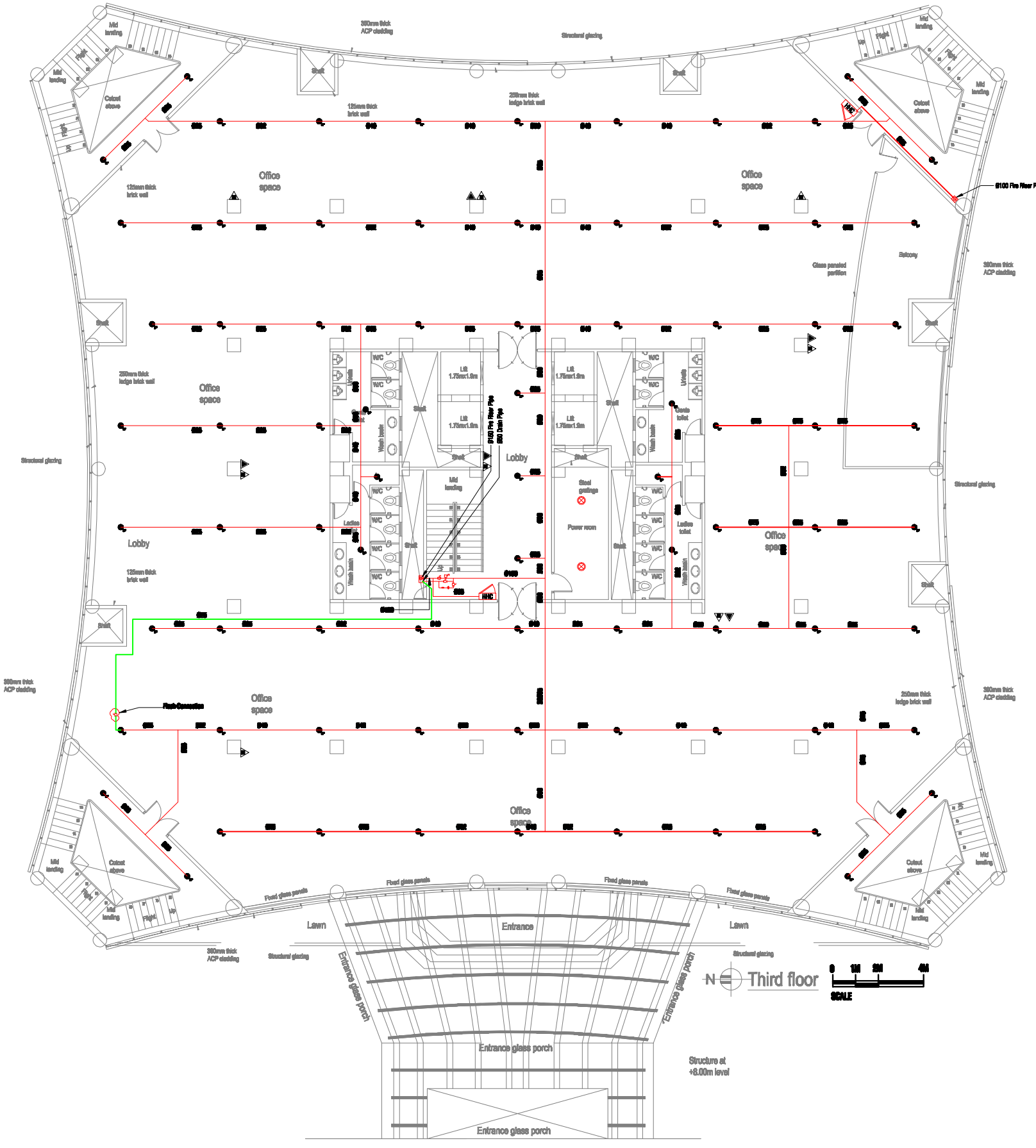

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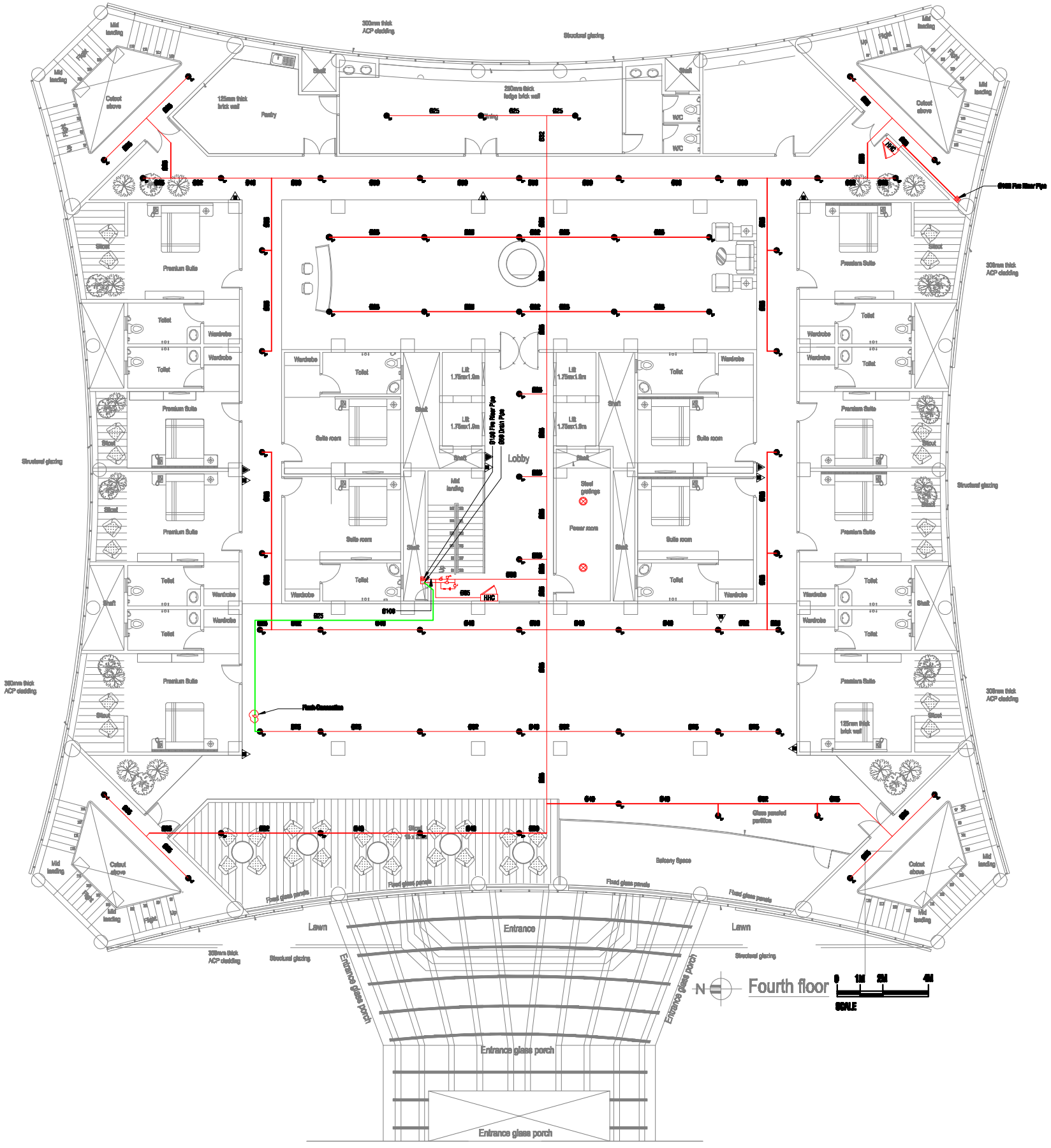

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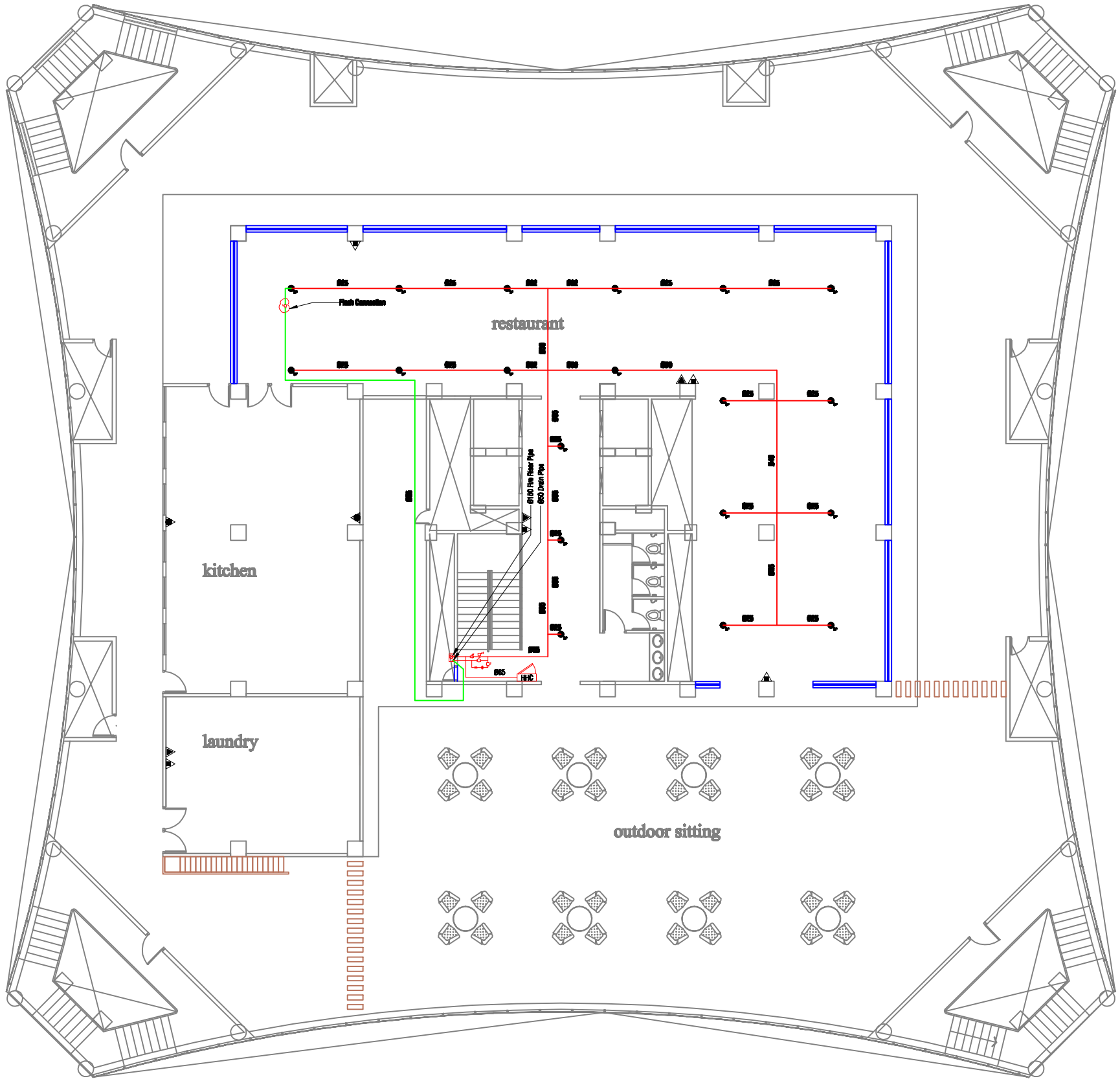

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ROOF TOP LAYOUT PLAN

0 1M 2M 4M
SCALE

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Fire Protection System Layout Drawing of Roof Top	July, 2020						01			Sheet No: S-11
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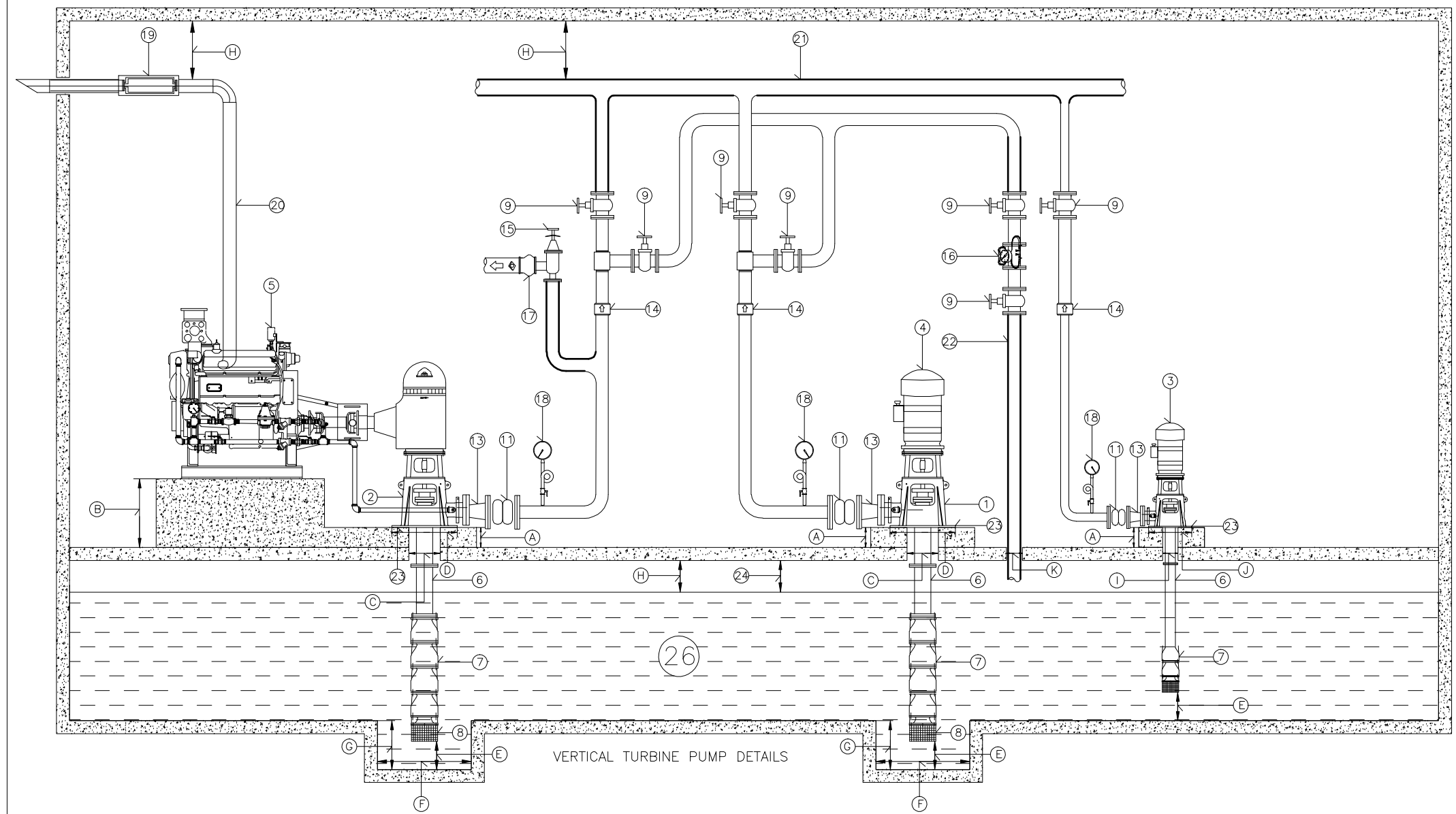

①	ELECTRIC PUMP
②	DIESEL PUMP
③	JOCKEY PUMP
④	ELECTRIC MOTOR
⑤	DIESEL ENGINE
⑥	COLUMN PIPE
⑦	BOWL
⑧	STRAINER
⑨	OS & Y GATE VALVE
⑩	Y– STRAINER
⑪	FLEXIBLE JOINT
⑫	ECCENTRIC REDUCER
⑬	CONCENTRIC REDUCER
⑭	CHECK VALVE
⑮	PRESSURE RELIEF VALVE
⑯	FLOW METER
⑰	WASTE CONE
⑱	PRESSURE GAUGE
⑲	SILENCER
⑳	ENGINE CHIMNEY
㉑	DISCHARGE HEADER
㉒	TEST LINE
㉓	MOUNTING FLANGE
㉔	FREEBOARD
㉕	FIRE PUMP ROOM
㉖	WATER RESERVOIR

DIMENSION	
Ⓐ	150MM
Ⓑ	650MM
Ⓒ	560MM
Ⓓ	880MM
Ⓔ	200MM
Ⓕ	900MM
Ⓖ	600MM
Ⓗ	300MM
Ⓘ	300MM
Ⓙ	550MM
Ⓚ	200MM

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BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Standard Detail Drawing (A)	July, 2020						01			Sheet No: S-12
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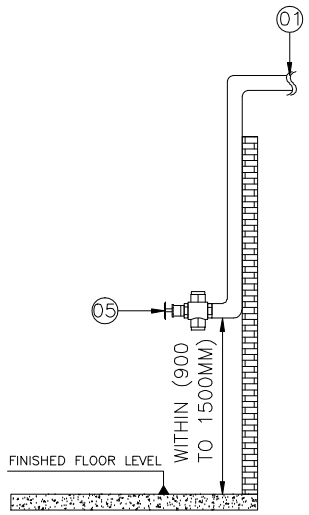
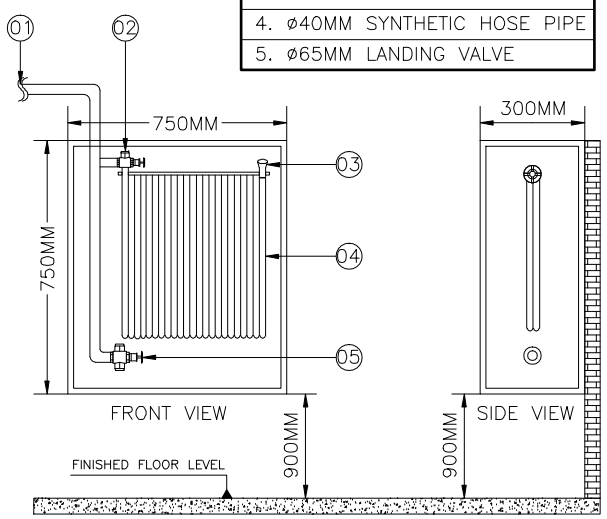
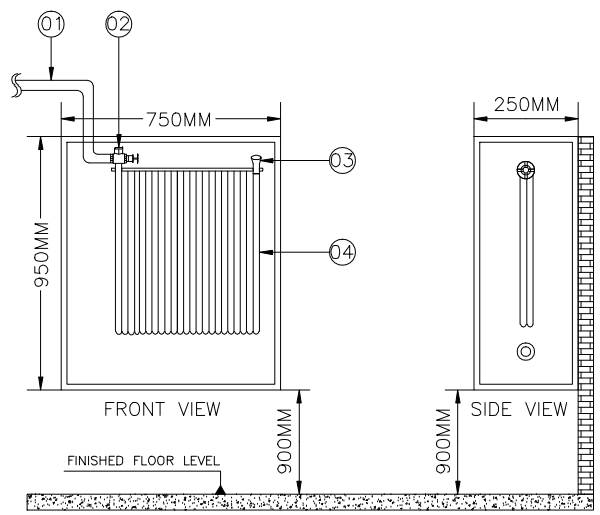


DETAILS OF LANDING VALVE

1. FROM FIRE RISER PIPE
2. ø40MM ANGLE HOSE VALVE
3. ø25MM NOZZLE
4. ø40MM SYNTHETIC HOSE PIPE
5. ø65MM LANDING VALVE

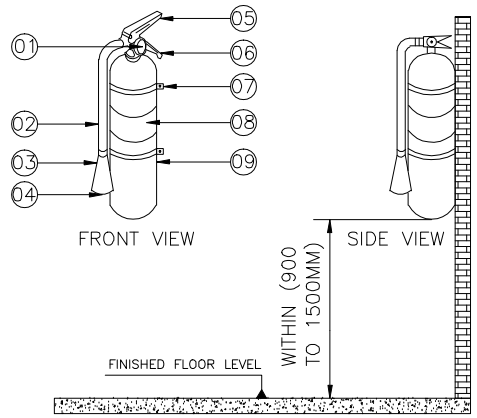


DETAILS OF CLASS III SYSTEM
HYDRANT HOSE CABINET

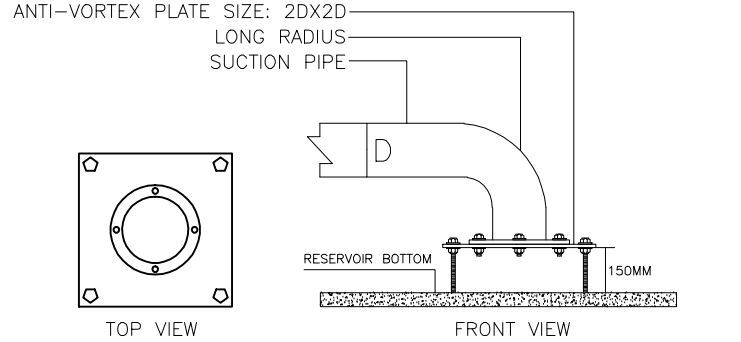


DETAILS OF CLASS II SYSTEM
HYDRANT HOSE CABINET

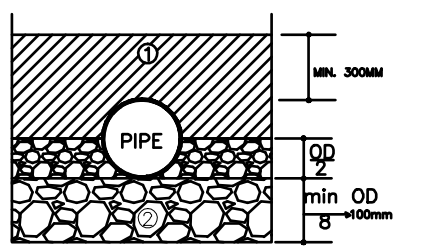
01	PRESSURE GAUGE
02	DISCHARGE HOSE
03	DISCHARGE NOZZLE
04	DISCHARGE ORIFICE
05	DISCHARGE LEVER
06	CARRYING HANDLE
07	BRACKET
08	DATA PLATE
09	BODY



DETAILS OF EXTINGUISHER



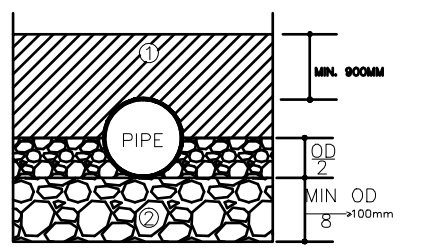
DETAILS OF ANTI–VORTEX PLATE



UNDERGROUND PIPE LINE TRENCH SECTION

NOTES:
1. CAREFULLY COMPACTED BACKFILL
2. COMPACTED GRANULAR MATERIAL
OD– OUTER DIAMITER

FOR GENERAL SPACE

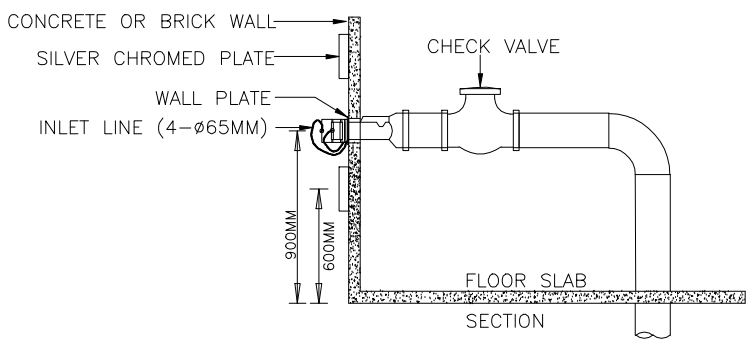


UNDERGROUND PIPE LINE TRENCH SECTION

NOTES:
1. CAREFULLY COMPACTED BACKFILL
2. COMPACTED GRANULAR MATERIAL
OD– OUTER DIAMITER

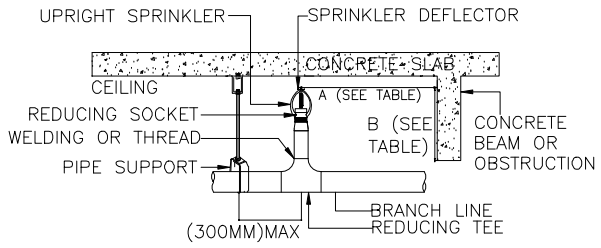
FOR DRIVE WAY

DETAILS OF UNDERGROUND PIPE THROUGH

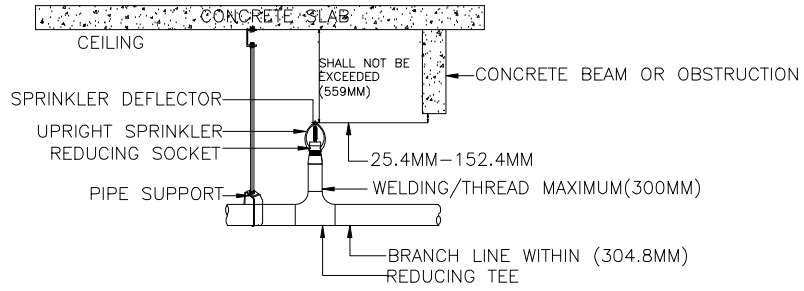


FIRE DEPARTMENT CONNECTION

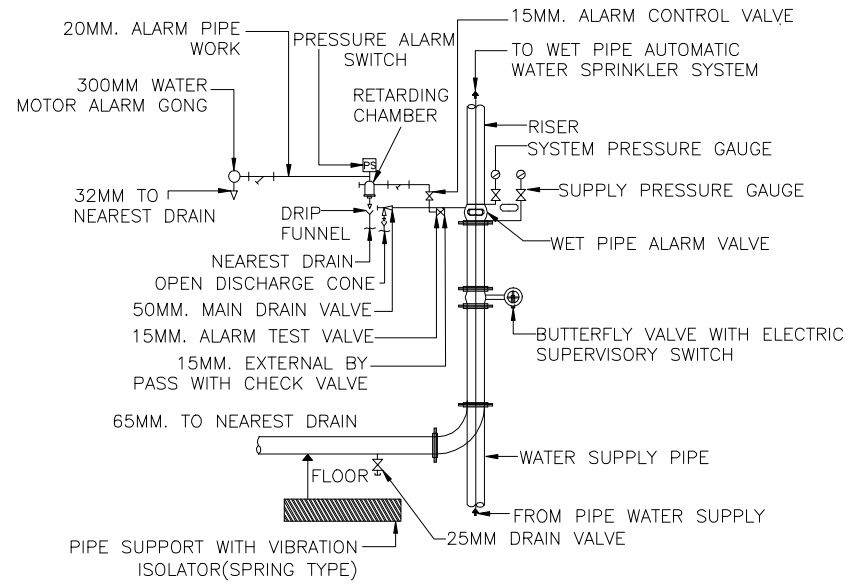
CLIENT:	PROJECT NAME:	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	Sk Kalim Uddin CAD operator	Subrata Kumar Sarkar Office Engineer	Md. Hasnotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Standard Detail Drawing (B)	July, 2020						01			Sheet No: S-13
								02			
								03			
								04			
								05			



SPRINKLER INSTALLATION DETAIL

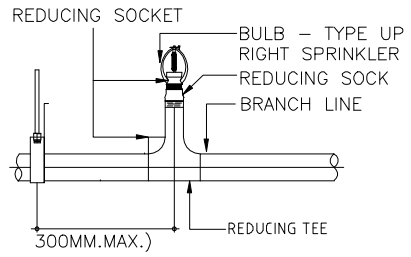


UPRIGHT SPRINKLER INSTALLATION

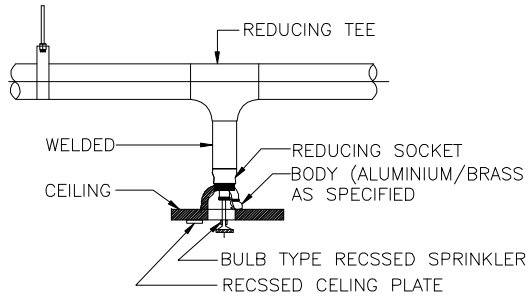


SCHEMATIC DIAGRAM OF WET PIPE ALARM VALVE PIPE WORK

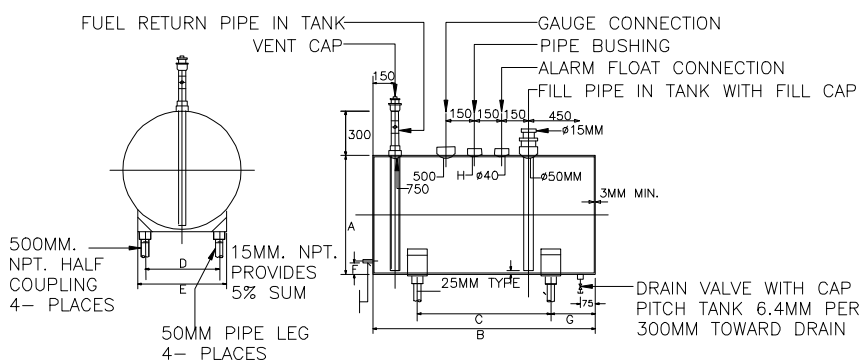
A	B (MM)
LESS THAN 300MM	0
300MM TO LESS THAN 350MM	65MM
350MM TO LESS THAN 600MM	80MM
600MM LESS THAN 650MM	150MM
650MM TO LESS THAN 900MM	200MM
900 LESS THAN 950MM	250MM
950MM TO LESS THAN 1200MM	300MM
1200MM TO LESS THAN 1250MM	350MM
1250MM TO LESS THAN 1500MM	400MM
1500MM TO LESS THAN 1550MM	450MM
1550MM TO LESS THAN 1800MM	500MM
1800MM LESS THAN 1850MM	600MM
1850MM TO LESS THAN 2100MM	750MM
2100MM TO LESS THAN 2250MM	880MM



UPRIGHT SPRINKLER INSTALLATION

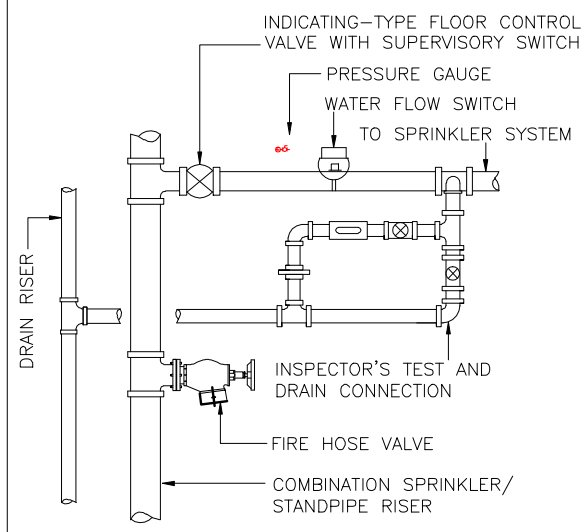


SPRINKLER HEAD INSTALLATION

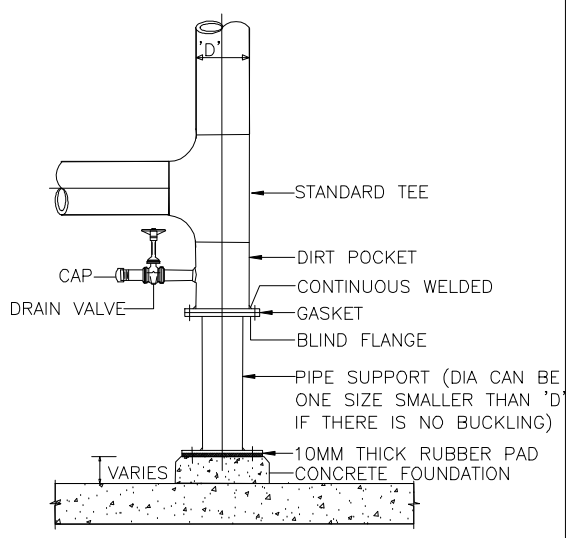


CAPACITY LITRES	DIMENSION (MM.)							
	A	B	C	D	E	F	G	H
400	600	1525	925	350	450	75	300	50
625	750	1525	926	400	500	75	300	80
1000	950	1525	925	575	675	95	300	80
1200	950	1825	1100	575	675	95	360	80
2000	1200	1825	1100	750	850	120	360	100

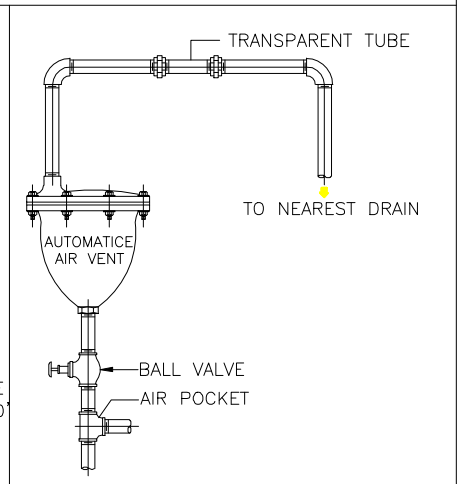
FUEL STORAGE TANK



ZONE CONTROL VALVE



PIPE RISER SUPPORT



NOTE:ALL HIGHEST POINTS IN THE PIPING CIRCUIT SHALL PROPERLY VENTED IC VERTICAL LOOP AND TOP PIPE RISERS.

AUTOMATIC AIR VENT

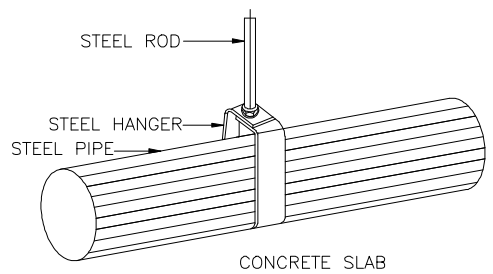
CLIENT: BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	PROJECT NAME: ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	SUBMITTED BY: Aarvee-BETS(JV) (BEZA-CS-2211)	DRAWN BY: Sk Kalim Uddin CAD operator	DRAWING CHECKED BY: Subrata Kumar Sarkar Office Engineer	DESIGNED BY: Md. Hasnotuzzaman	CHECKED BY: Dr. V.G. Hiremath Team Leader	APPROVED BY: BEZA	REVISION: NO / REVISION / DATE: 01, 02, 03, 04, 05
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Standard Detail Drawing (C)	July, 2020						DRAWING STATUS: FOR CONSTRUCTION; Sheet No: S-14

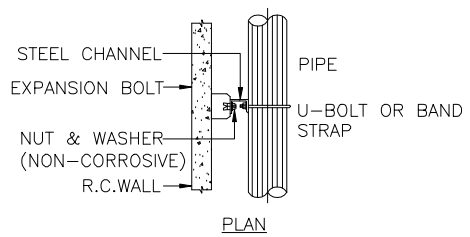
MAXIMUM DISTANCE BETWEEN HANGERS

(AS PER NFPA 13, TABLE REF: 9.2.2.1 2013 EDITION)

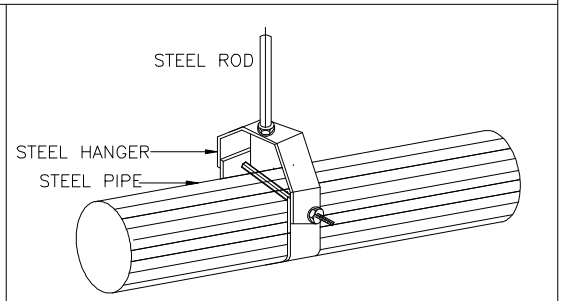
PIPE SIZE	MAX. SPACE BET. HANGERS	WT. PER METER (KG)		CALC. LOAD (KG/M)	MAX. RECOM. LOAD (KG/M)
		WATER	PIPE		
ø25	3.66m	0.56 KG	2.5 KG	129	446
ø32	3.66m	0.98 KG	3.4 KG	136	446
ø40	4.57m	1.3 KG	4.1 KG	141	446
ø50	4.57m	2.2 KG	5.5 KG	152.5	446
ø65	4.57m	3.1 KG	8.6 KG	172.5	781
ø80	4.57m	4.8 KG	11.30 KG	194.5	781
ø100	4.57m	8.2 KG	16.1 KG	235.5	967
ø150	4.57m	18.6 KG	28.22 KG	348	1488
ø200	4.57m	32.15 KG	42.50 KG	487	1488

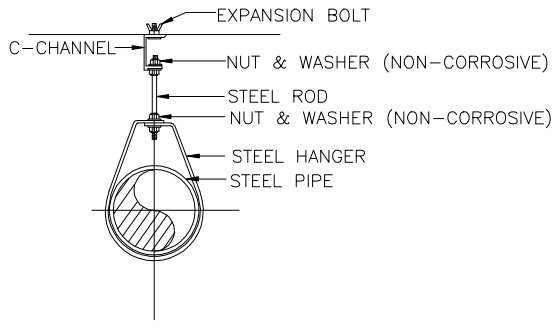
PIPE SIZE (MM)	ANGLE BAR SIZE (MM)	ROD SIZE	DIMENSION (MM)			THREAD LENGTH	THREADED ANCHOR BOLT W/ EXPANSION SHIELD (MM)
		A	B	C	H	TL	
ø65	40X40X5	10MM	90	79	109	45MM	M12
ø80	40X40X5	10MM	103	93	122	45MM	M12
ø100	40X40X5	10MM	128	118	148	45MM	M12
ø150	50X50X6	12MM	184	172	207	50MM	M12
ø200	50X50X10	16MM	239	223	271	70MM	M16



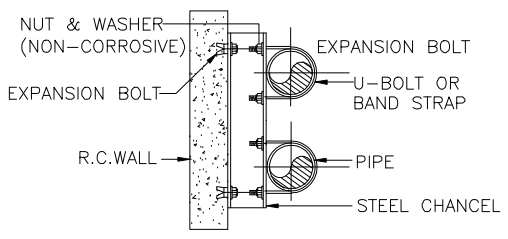


PLAN

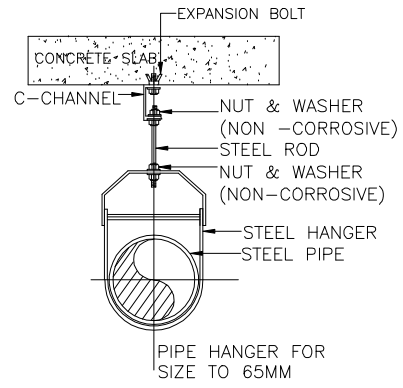




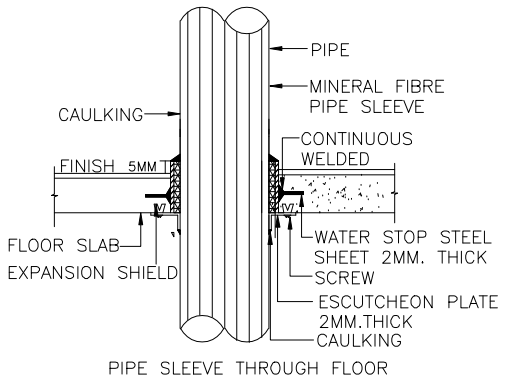
PIPE HANGER FOR SIZE UP TO 50MM



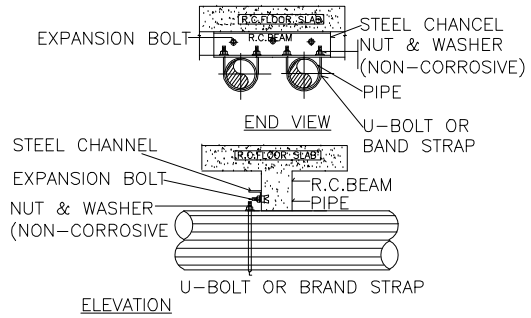
ELEVATION
PIPE SUPPORT TO WALL



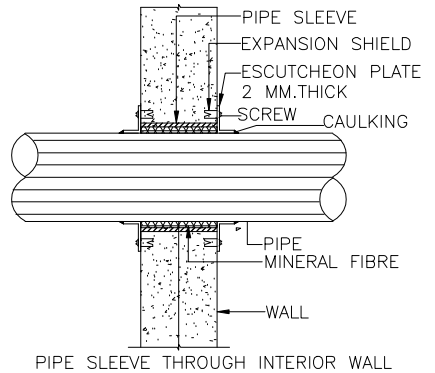
PIPE HANGER FOR SIZE TO ø65MM



PIPE SLEEVE THROUGH FLOOR



ELEVATION
NOTE: ALL STEEL PARTS SHALL BE PAINTED WITH 2 COATS OF ANTI–RUST PAINT.
PIPE HANGER FROM BEAM



PIPE SLEEVE THROUGH INTERIOR WALL

CLIENT:	PROJECT NAME:	SUBMITTED BY:	DRAWN BY:	DRAWING CHECKED BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:	REVISION:			DRAWING STATUS:
BANGLADESH ECONOMIC ZONES AUTHORITY (BEZA)	ARCHITECTURAL DRAWING OF PROPOSED ADMIN BUILDING AT MIRSARAI EZ. CHITTAGONG.	Aarvee-BETS(JV) (BEZA-CS-2211)	Sk Kalim Uddin CAD operator	Subrata Kumar Sarkar Office Engineer	Md. Hasnotuzzaman	Dr. V.G. Hiremath Team Leader	BEZA	NO	REVISION	DATE	FOR CONSTRUCTION
BANGLADESH ECONOMIC ZONES DEVELOPMENT PROJECT (PHASE-1)	DRAWING TITLE: Standard Detail Drawing (D)	July, 2020						01			Sheet No: S-15
								02			
								03			
								04			
								05			